

# 13

## Abortion

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### INTRODUCTION

Several definitions of abortion are found in the literature but it is widely accepted that abortion is the loss of a pregnancy before the period of viability<sup>1,2</sup>. This period of viability will depend on the resources available; in many resource-poor settings most of the babies delivered at gestational age of 28 weeks or more may survive. In the better resourced parts of the world, fetuses weighing 500 g or more or a gestational age above 24 weeks can survive although they may be handicapped<sup>3</sup>.

The term abortion often has emotional connotations for women and their families dealing with loss of a pregnancy. Using the term 'abortion' is even more challenging in countries where termination of pregnancy is illegal. Although the 10th version of the International Statistical Classification of Diseases (ICD) and related health problems still uses the term 'abortion' it has been replaced over the last few years by 'miscarriage' to describe pregnancy loss before 20 or 24 weeks of gestation<sup>1-4</sup>.

A pregnancy can be spontaneously lost (spontaneous miscarriage) or deliberately terminated (induced miscarriage).

The most common complications of abortions/miscarriages that may put the life of the woman at risk are bleeding and sepsis (infection). Trained healthcare workers who perform induced abortions where the law permits in safe premises, using the correct equipment/method have fewer complications than untrained persons who induce abortions unsafely. Unsafe abortions increase the risk of morbidity and death.

The World Health Organization (WHO) estimated that 21.6 million unsafe abortions occurred worldwide in 2008 and complications from these

accounted for about 13% of maternal deaths (MD) (47,000 MD per year). There is also a huge disparity in the ratio of maternal deaths attributable to unsafe abortion per 100,000 live births in developed countries compared to developing countries: 1 vs 40/100,000<sup>5</sup>. Less developed regions of the world have the greatest risk of morbidity and mortality from unsafe abortion, the least proportion of skilled health personnel, the lowest contraceptive prevalence rates and, largely, have restrictive abortion laws.

Deaths from unsafe abortion are entirely preventable through the use of contraceptives, use of safe termination services especially when contraceptives fail or for pregnancies resulting from gender-based violence (sexual violence, rape etc.) and through effective post-abortion care. Most primary and first referral healthcare facilities lack skilled health personnel and strong systems to provide lifesaving interventions for most complications from unsafe abortions<sup>6</sup>.

This chapter will discuss provision of safe abortion services and post-abortion care including managing the complications from spontaneous miscarriage and unsafe abortion. Management of recurrent miscarriage, family planning and contraception are discussed in Chapters 14 and 15.

### DIFFERENT TYPES OF SPONTANEOUS MISCARRIAGES (see also Chapter 2)

*A spontaneous miscarriage/abortion* is the spontaneous loss of pregnancy before 20 weeks or a fetus born weighing <500 g (ICD 11). Spontaneous miscarriage has been observed in 15–20% of pregnancies recorded through hospital statistics and this may be up to 30% using community-based assessments<sup>7</sup>.

Most spontaneous miscarriages occur before 12 weeks of gestation while pregnancy loss between 12 and 24 weeks of gestation occurs in <4% of pregnancies<sup>2,8</sup>. Miscarriage is associated with both medical and psychological consequences. The medical complications include hemorrhage, infection, embolism and complications of anesthesia, and the psychological consequences include depression and anxiety for the woman and her family. Spontaneous abortion may be complete or incomplete.

*Missed abortion* refers to early pregnancy failure with anembryonic gestation or fetal/embryonic death (ICD 11). Diagnosis is usually by ultrasonography, which will show an empty gestational sac or an embryo/fetus without cardiac activity. A second ultrasound after 2 weeks may be needed to confirm the diagnosis. Serum  $\beta$ -human chorionic gonadotropin ( $\beta$ hCG) may be analyzed if available and appropriate.

Generally this arrest of fetal development occurs some time before its expulsion. Several other terms (especially on ultrasound scan reports) have been used to describe missed abortion; these include ‘anembryonic pregnancy’, ‘blighted ovum’, ‘early fetal demise’, ‘non-viable pregnancy’ and ‘embryonic/fetal death’<sup>9</sup>. There may be a history of lower abdominal pain with or without vaginal bleeding. On pelvic examination the cervix is usually closed (this is in contrast to incomplete abortion). The treatment is evacuation of the uterus and the options are expectant, medical or surgical. Women should be given a choice as to what method to use; however the choice tends toward surgical when there is significant bleeding<sup>10</sup> (level of evidence 1).

Some women coming to you with vaginal blood loss might not be aware (or want to be aware) of the fact that they are pregnant. You should bear this

in mind in any patient of reproductive age with vaginal blood loss and make the diagnosis through history, gynecological examination and if necessary urine for pregnancy test (UPT) and ultrasound.

**HISTORY TAKING**

This may include the following:

- Last menstrual period (keep in mind that vaginal bleeding as a sign of miscarriage might be mistaken for a period. Ask if the last bleeding was as usual or different).
- Obstetric history (see Chapter 1). Ask specifically for previous miscarriages.
- Use of contraceptives, planned use for the future, desire for children.
- Gynecological history (see Chapter 1). Dilatation and curettage (D&C) is often not considered as an operation by patients. Ask specifically about D&C or manual vacuum aspiration (MVA) or other uterine operations.

**SPECULUM AND BIMANUAL EXAMINATION**

You can find a description on how to do a speculum and bimanual examination in Chapter 1. The most important aims of your examination will be to determine whether your patient is pregnant and, if yes, whether there are signs of miscarriage (see Chapter 2 on first-trimester blood loss) and if yes, whether the miscarriage is complete or incomplete (Table 1). Look specifically for:

- Products of conception in cervical os or vagina
- Cervical dilatation
- Amount of blood loss
- Size and consistency of the uterus.

**Table 1** Difference between complete and incomplete abortion

	<i>Incomplete</i>	<i>Complete</i>
History	Missed period, lower abdominal pain, vaginal bleeding	Missed period, lower abdominal pain, vaginal bleeding (last 2 likely to be subsiding or absent on presentation)
Abdominal examination	Uterus maybe palpable	Uterus maybe palpable
Pelvic examination	May be active bleeding Products may be visible around within the os Bimanual examination uterus is bulky Cervical os is $\geq 2$ cm dilated	Less likely to be significant bleeding No products Uterus may be larger than normal Cervical os is $< 2$ cm dilated

If you are not sure whether a miscarriage is complete or incomplete after examination or if a pregnancy is viable at all and ultrasound is available, do a (preferably vaginal) ultrasound (see Chapter 2, and Chapter 12 on ectopic pregnancy) and assess for:

- Presence of embryo/fetus
- Presence of fetal heart activity
- If no embryo/fetus present, exclude ectopic pregnancy (Chapter 12)
- If ectopic pregnancy is excluded, the sonographic measurement of intrauterine content can help you to determine the likelihood of complete abortion. The evidence is that endometrial thickness and uterine volume are reliable in diagnosing incomplete abortion. However a combination of hyperechoic material in the endometrial cavity and/or vaginal bleeding raises the sensitivity to 98% and negative predictive value to 95%. Thus, the absence of ultrasound finding and vaginal bleeding excludes retained products of conception (RPOC) in 95% of cases<sup>11</sup>.

### INDUCTION OF ABORTION INCLUDING SAFE MEDICAL AND SURGICAL TECHNIQUES

Induced abortion is legal in many countries and provides a treatment option for women who experience contraceptive failure, pregnancies resulting from sexual violence or as a matter of choice for some women<sup>12</sup>. Most induced abortions are performed during the first trimester (first 13 weeks of pregnancy).

There are several medical and surgical methods that can be safely used to induce abortion. Medical abortion is one that is brought about by taking medications that will terminate a pregnancy. The medical methods include the use of prostaglandins alone such as misoprostol (prostaglandin E<sub>1</sub>), mifepristone (anti-progesterone RU486) or methotrexate (cytotoxic antimetabolite) alone or in combination, while the surgical methods are vacuum aspiration (VA) (manual or electrical) or D&C.

The complication rates associated with surgical methods increase with gestational age and parity<sup>13</sup>. The lowest complications occur with first-trimester terminations (49–56 days of amenorrhea). The complications from surgical methods include infec-

tion, cervical laceration, incomplete evacuation, uterine perforation, hemorrhage and complication due to anesthesia. The major complications of D&C are 2.3 times higher than with VA<sup>14</sup>.

### Medical methods

Medical abortions can be effective up to 24 weeks of pregnancy<sup>12</sup>. The complications/side-effects associated with medical methods are moderate to heavy bleeding, pain, nausea, vomiting and diarrhea; the severity depends on the regimen used and the gestational age of the pregnancy. Heavy bleeding is probably due to incomplete abortion, this needs to be completed using a surgical method such as MVA.

Medical methods have been reported to be slightly less effective than surgical methods (VA), they are also associated with a longer duration of bleeding compared to VA<sup>15</sup>. Medical methods of induced abortion although effective are best used within health systems where follow-up of patients can be guaranteed. Factors which influence the acceptability of the method of termination are safety, efficacy, number of healthcare facility visits, mode of action, how long it takes for the abortion to be complete and cost<sup>12</sup>. Medical abortion has the advantage of self-administration, being non-invasive and may not involve another visit to the healthcare provider provided there are no complications. The surgical method on the other hand is invasive but can be simple to perform and the procedure can be over within a short time.

Combined medical regimens are more effective than single agents. When mifepristone is used in combination with misoprostol the dose can be safely lowered to 200 mg<sup>16</sup>. A regimen for medical induced abortion is presented in Table 2<sup>12</sup>. While terminations at gestational age up to 9 weeks may be completed on an out-patients basis, it is recommended that for women with gestational age 10–13 weeks, administration of misoprostol and completion of the process takes place in a healthcare facility. It is also strongly recommended that women have access to a provider who can perform surgical evacuation such as MVA, should this be required.

Misoprostol should be used with extreme caution when used in the second trimester (preferably at lower dosage if at all!) in women with previous uterine scar, for example from a cesarean

**Table 2** Medical regimen for induced abortion<sup>12</sup>

<i>Medical abortion (up to 9 weeks LMP)</i>	<i>Medical abortion (10–13 weeks LMP)</i>
Booking plus provision of mifepristone to take immediately and instructions on using misoprostol at home	Booking plus provision of mifepristone if available to take immediately
For women who return to use misoprostol in the clinic 36–48 h later, a stay of 3–4 h for abortion to take place	Provision of misoprostol in the clinic 36–48 h later with repeat doses if required, staying until abortion takes place, with 1–3 h recovery
Follow-up visit 2 weeks later to check if the abortion is complete and there are no complications	Follow-up visit 2 weeks later to check if the abortion is complete and there are no complications

LMP, last menstrual period

**Table 3** Drug regimen for medical abortions

<i>Indication</i>	<i>First trimester (0–12 weeks from LMP)</i>	<i>Second trimester (13–24 weeks from LMP)</i>
Incomplete abortion	600 µg misoprostol orally or 400 µg sublingually as a single dose <sup>17,18</sup>	
Medical abortion	400 µg misoprostol vaginally 3-hourly. Use 200 µg only in women with cesarean scar. Ideally used 48 h after mifepristone 200 mg <sup>18</sup>	400 µg vaginally 3-hourly. Use 200 µg only in women with cesarean scar. Ideally used 48 h after mifepristone 200 mg <sup>19</sup>
Missed abortion	Vaginal misoprostol 800 µg stat or sublingual misoprostol 600 µg. Leave to work for 1–2 weeks (unless heavy bleeding or infection) <sup>9,18</sup>	Leave to work for 1–2 weeks (unless heavy bleeding or infection). It is not uncommon to find undissolved misoprostol tablets at vaginal examination; this does not appear to affect its absorption

LMP, last menstrual period

section. Table 3 gives dosages of misoprostol used in first- and second-trimester medical abortions, incomplete abortions and missed abortion<sup>17–19</sup>. Information on misoprostol availability can be found at: <http://www.misoprostol.org/File/availability.php> and [http://www.figo.org/files/figo-corp/Misoprostol\\_Poster\\_2.pdf](http://www.figo.org/files/figo-corp/Misoprostol_Poster_2.pdf), and on mifepristone at: [http://gynuity.org/downloads/MA\\_guidebook\\_2nd\\_ed\\_en.pdf](http://gynuity.org/downloads/MA_guidebook_2nd_ed_en.pdf).

To date, mifepristone has been registered in over 35 countries, but most of these are in the industrialized world. Fewer developing countries have made this drug available, in part because of more restrictive abortion laws and the cost of the drug (<http://gynuity.org/programs/more/introduction-of-medical-abortion-in-developing-countries/>).

Note: contraindications to the use of misoprostol include, known allergy to the drug, suspected ectopic pregnancy, unstable hemodynamics

and shock and signs of pelvic infections and/or sepsis<sup>9,20</sup>.

### **Surgical methods for termination of pregnancy**

Different surgical methods for termination of pregnancy have become available over the years: MVA, electrical powered VA (EVA) and D&C. A Cochrane systematic review on surgical methods for first-trimester termination of pregnancy<sup>21</sup> which compared VA (MVA or EVA) and D&C, flexible versus rigid cannula and MVA versus EVA reported the following:

- *Vacuum aspiration versus D&C*: There were no statistically significant differences for excessive blood loss, blood transfusion, febrile morbidity, incomplete or repeat uterine evacuation procedure, re-hospitalization, postoperative abdominal pain or therapeutic antibiotic use; however

the duration of operation was statistically significantly shorter with VA compared to D&C in women with gestational age: <9 weeks and ≥ 9 weeks.

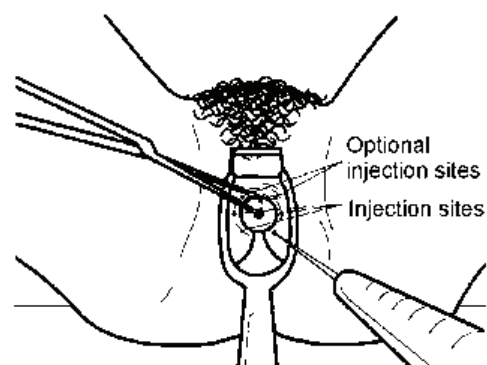
- *Flexible versus rigid vacuum aspiration cannula:* There were no statistically significant differences with regard to cervical injuries, febrile morbidity, blood transfusion, therapeutic antibiotic use, or incomplete or repeat uterine evacuation procedure.
- *MVA versus EVA:* Severe pain was reported less often with MVA compared to EVA in women with <9 weeks of amenorrhea. In women with amenorrhea >9 weeks, severe difficulty of the procedure was reported more frequently with MVA compared to EVA; however there was no difference in cervical injuries, excessive blood loss, blood transfusion, febrile morbidity, repeat uterine evacuation, duration of operation and women's preference between the two groups (Level of evidence 1).

There are limited studies addressing outcomes such as need for pain relief, women's satisfaction, surgeon's instrument preference and long-term outcomes such as fertility. Most women in a recent qualitative survey of pain relief during first-trimester surgical abortions felt that pain control decisions should be individualized<sup>22</sup>.

The procedure of uterine evacuation is associated with pain; the pain arises from dilation of the undilated cervix (surgical abortion and missed abortion) and from the uterine contractions during and after the procedure. A Cochrane review found out that there was no clear advantage with the use of paracervical block (PCB): PCB with premedication (ibuprofen and naproxen) resulted in reduced intra- and postoperative pain, while diclofenac sodium did not reduce pain; conscious sedation (addition of diazepam and fentanyl to PCB) decreased procedural pain, while general anesthesia provided good intraoperative pain relief but was less effective for postoperative pain relief compared to conscious sedation<sup>23</sup> (Level of evidence 1). Music as an adjunct to local anesthesia used during surgical abortion procedures has been found to be associated with less anxiety post-procedure and better coping while maintaining high patient satisfaction; it however does not appear to affect abortion pain<sup>24</sup>. Box 1 shows the steps for administering a paracervical block.

### Box 1 Steps for administering a paracervical block

Prepare a syringe of lidocaine, using the lowest dose possible, usually 10–20 ml of 0.5–1.0% solution. Dosage should not exceed 200 mg.



After the cervix has been cleaned with anti-septic, insert the needle at the site where the tenaculum will be placed. Before injecting, always aspirate by drawing the plunger back slightly. If any blood is visible in the aspirator, move to a different site and aspirate again. If no blood is visible, inject the lidocaine.

Place the tenaculum at the anesthetized site. If the uterus is retroverted, posterior placement of the tenaculum may help to straighten the angle between the cervix and uterus. Use slight traction to move the cervix toward the introitus and find the transition of smooth cervical epithelium to wrinkled vaginal tissue. This cervical–vaginal junction marks the site for additional injections.

Inject additional lidocaine into the anterior or posterior lip of the cervix. The exact sites vary according to provider preference and facility protocols; for instance, at 3, 9 and 12 o'clock, or at 1, 4, 8 and 11 o'clock. Inject slowly to decrease the pain of the injection, to a depth of 1–1.5 inches (2.5–3.8 cm).

Some providers wait several minutes after administering the block before beginning dilatation.

Ref: WHO. Managing Complications in Pregnancy and Childbirth (MCPC) – A Guide for Midwives and Doctors, IPAS CD ROM for post abortion care. Geneva: WHO, 2000

## UNSAFE ABORTION AND ITS COMPLICATIONS

It was estimated that 208 million pregnancies occurred worldwide in 2008, approximately 16% (33 million) of them resulted in unintended births and 20% (41 million) ended as induced abortions<sup>25</sup>. While consistent use of contraceptives will reduce the number of unintended pregnancies, induced abortions will be performed safely in countries where it is legal, and largely ‘unsafely’ in countries where it is illegal.

WHO defines unsafe abortion as a procedure for terminating an unintended pregnancy carried out either by persons lacking the necessary skills or in an environment that does not conform to minimal medical standards or both<sup>26,27</sup>. Worldwide, 48% of all induced abortions are unsafe; 95% of these are performed under unsafe circumstances in Africa and Latin America. An estimated 5 million women are hospitalized each year for treatment of abortion-related complications<sup>25</sup>.

Women with unsafe abortion may present in shock arising from severe hemorrhage or sepsis; they

may have signs suggestive of uterine perforation with peritonitis or/and various degrees of lower genital tract trauma<sup>14,28</sup>. The leading causes of death are hemorrhage, infection and poisoning from substances used for induced abortion. Gas gangrene from *Clostridium perfringens* is commonly reported following insertion of foreign bodies. These also increase the risk of tetanus infection in women who are not immunized. Commonly used materials for unsafe abortions are presented in Table 4<sup>28</sup>; possible complications associated with the use of these substances/materials include chemical burns, ruptured uterus, gastrointestinal tract injuries, genital tract trauma and infection. Up to 50% of women who have an unsafe abortion will require medical care<sup>6</sup>.

Although there is limited information on long-term health consequences of unsafe abortion, WHO estimates that about 20–30% of unsafe abortions result in reproductive tract infections and that about 20–40% of these result in upper genital tract infection and infertility<sup>6</sup>. An estimated 2% of women of reproductive age (15–59 years) are infertile as a result of unsafe abortion, and 5% have chronic infections. Long-term risk of ectopic

**Table 4** Part inventory of unsafe abortion methods, by route of administration<sup>28</sup>

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### Treatments taken by mouth

#### *Toxic solutions*

Turpentine; laundry bleach; detergent solutions; acid; laundry bluing; cottonseed oil; arak (a strong liquor)

#### *Teas and herbal remedies*

Strong tea; tea made of livestock manure; boiled and ground avocado or basil leaves; wine boiled with raisins and cinnamon; black beer boiled with soap, oregano and parsley; boiled apio (celery plant) water with aspirin; tea with apio, avocado bark, ginger, etc; ‘bitter concoction’; assorted herbal medications

#### *Drugs*

Uterine stimulants, such as misoprostol or oxytocin (used in obstetrics); quinine and chloroquine (used for treating malaria); oral contraceptive pills (ineffective in causing abortion)

### Treatments placed in the vagina or cervix

Potassium permanganate tablets; herbal preparations; misoprostol

### Intramuscular injections

Two cholera immunizations

### Foreign bodies placed into the uterus through the cervix

Stick, sometimes dipped in oil; lump of sugar; hard green bean; root or leaf of plant; wire; knitting needle; rubber catheter; bougie (large rubber catheter); intrauterine contraceptive device; coat hanger; ballpoint pen; chicken bone; bicycle spoke; air blown in by a syringe or turkey baster; sharp curette

### Enemas

Soap; Shih tea (wormwood)

### Trauma

Abdominal or back massage; lifting heavy weights; jumping from top of stairs or roof

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pregnancy, premature delivery and spontaneous abortion in subsequent pregnancies are known to be associated with unsafe abortion.

Women who have had complications arising from spontaneous or induced abortions require post-abortion care.

## POST-ABORTION CARE

In addition to treatment for complications incomplete and unsafe abortions, there is an opportunity to provide other reproductive health services such as family planning, cervical cancer screening, HIV counseling and testing etc., when caring for these women. Post-abortion care has five main components: community and service provider partnerships, treatment, counseling, family planning and contraceptive services and linkage with other reproductive health services. Box 2 has details of each component.

### Box 2 Essential elements of post-abortion care<sup>20</sup>

1. *Community and service provider partnerships*
  - Prevent unwanted pregnancies and unsafe abortion
  - Sensitize the communities about the scope of the problem and causes of miscarriage and about the availability of post-abortion care.
  - Mobilize resources to help women receive appropriate and timely care for complications of abortion
  - Ensure that health services reflect and meet community expectations and needs
2. *Counseling*
  - Identify and respond to women's emotional and physical health needs and other concerns
3. *Treatment*
  - Treat incomplete and unsafe abortion and potentially life-threatening complications
4. *Family planning and contraceptive services*
  - Help women practice birth spacing or prevent an unwanted pregnancy
5. *Reproductive and other health services*
  - Preferably provide on-site, or via referrals to other accessible facilities in provider's network

## COMMUNITY SERVICE PROVIDER PARTNERSHIPS

The community plays a very important role working with health service providers to educate and

advocate to increase contraceptive use and prevent unwanted pregnancy, space births and reduce unsafe abortion. The participation by community members in decisions about availability, accessibility and cost of services is crucial to sustaining post-abortion care services. The community also has an important role in improving health-seeking behavior through education on recognition and response to obstetric and reproductive health emergencies. Even if women and their families decide to seek care early, they will need to travel to the healthcare facility. Communities can mobilize the resources needed to ensure that transportation is readily available for women who require emergency care. Lastly community advocacy for holistic, human rights-based reproductive health policies and services that cater for women from disadvantaged groups such as adolescents, women with HIV or AIDS, women who have experienced violence or genital cutting, refugees, commercial sex workers, and women with cognitive or physical disabilities, priorities and needs.

Women who have lost a pregnancy need both psychological/mental support; immediate counseling is often of great value.

## TREATMENT

Women who present with complications will need careful assessment to identify all possible complications. Adequate resuscitation (support for respiratory and cardiovascular systems) may be necessary in severe cases (for management of severe cases see Chapter 2). Simple laboratory investigations like hemoglobin level/packed cell volume, full blood count and differentials are useful and may be available at primary healthcare level. In district hospitals or larger referral hospitals, in addition to these blood urea and electrolytes tests, blood, urine and genital tract swab cultures may be available. Parenteral antibiotics with broad-spectrum antibiotics based on local protocols and availability should be started as soon as possible prior to any uterine evacuation or laparotomy. Blood should also be cross-matched and transfused as soon as possible if indicated.

There are several approaches of managing retained uterine products. Expectant management (allowing the miscarriage to complete on its own), medical management (use of drugs) or surgical management (MVA or D&C) are options to ensure

that the miscarriage is complete and that the risk of complications is minimized. Expectant management is likely to result in a higher risk of incomplete miscarriage, bleeding and a need for surgical uterine evacuation compared to surgical management alone. It is not suitable for complicated abortions, such as septic abortion. However surgical evacuation is associated with significantly higher risk of infection than expectant management in uncomplicated abortion<sup>29</sup>.

Standard infection prevention precautions, informed consent, appropriate pain management, sensitive physical and verbal patient contact, and follow-up care should be undertaken. Also with surgical evacuation the cervix needs to be dilated in cases of missed abortion (this will be associated with more pain), but with incomplete abortion (spontaneous or induced) the cervix is dilated and no further cervical dilation is required.

#### **Medical treatment of spontaneous miscarriages and missed abortions**

A recent Cochrane review concluded that medical treatment with misoprostol and expectant care are both acceptable alternatives to routine surgical evacuation especially where health resources are available to support all three approaches<sup>10</sup>.

Hospitalization is not necessary if hemodynamically stable. Expulsion may occur hours or several weeks after administration of misoprostol. Routine antibiotic coverage is not necessary but drugs such as paracetamol or non-steroidal anti-inflammatory drugs (NSAIDs) can be used for pain relief. However one should be aware of the following two possibilities:

1. No tissue is found on evacuation. The woman has either a complete abortion or an ectopic pregnancy. An ultrasound is indicated. See Chapter 12.
2. Grape-like particles are obtained at evacuation: the patient may have gestational trophoblastic disease. See Chapter 27.

Misoprostol may have an unpleasant taste and may be associated with numbness of the tongue when used sublingually<sup>30</sup>. Other important side-effects of misoprostol to look out for include:

- *Cramping*: These arise from the uterus and start shortly after administration of misoprostol.

- *Fever/chills*: These are transient; if they persist beyond 24 h rule out any uterine/pelvic infection. Also bear in mind other causes of fever in that setting. Paracetamol or NSAIDs can be used for the management.
- *Nausea and vomiting*: These are likely to occur and resolve within 2–6 h of administration of misoprostol. An antiemetic such as hyoscine hydrochloride may be necessary.
- *Diarrhea*: This may occur but is likely to be associated with sublingual administration. This usually resolves within 24 h.

The bleeding may last for more than 14 days, but it should progressively become lighter. The woman should be instructed to contact a provider if she soaks more than two extra-large sanitary pads an hour for more than two consecutive hours, or has bled continuously for more than 2 weeks and or/begins to feel dizzy or light headed. With the medical method for uterine evacuation, if there is infection or heavy bleeding prior to complete evacuation (failed medical evacuation), surgical evacuation may be indicated. However if the woman remains clinically stable after 10–14 days without complete evacuation and she is willing to continue with this method, the dose of misoprostol can be repeated<sup>9</sup>.

#### **Surgical treatment of spontaneous miscarriages and missed abortion**

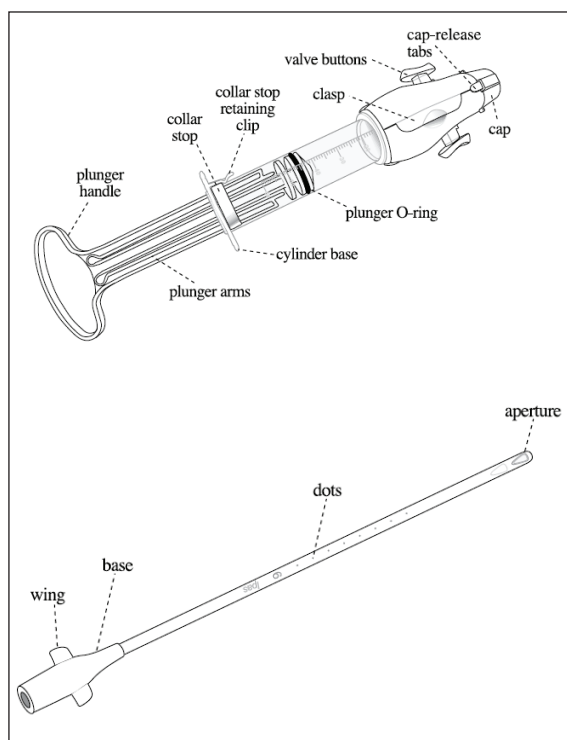
Although uterine evacuation is a very important component of the treatment, it is important to ensure that the patient is adequately resuscitated before uterine evacuation (see Chapter 2). Surgical evacuation is achieved through suction evacuation or curettage of the uterus. Suction required for uterine evacuation can be delivered via a manual or electrical mechanism as discussed earlier on.

#### **Manual vacuum aspiration**

MVA is a cost-effective method of uterine aspiration that has been shown to be of great value in low-resource settings. It has the advantage of reducing the cost of treatment because it does not rely on electricity and it can usually be performed as outpatient treatment.

The IPAS MVA Plus and IPAS EasyGrip cannulae (Figure 1) are simple low-cost reproductive health equipment used for the treatment of incomplete abortion up to 12 weeks from the last





**Figure 1** IPAS MVA Plus and IPAS EasyGrip cannulae

menstrual period and for first-trimester termination of pregnancy. The IPAS aspirators are multiple-use devices that require high-level disinfection or sterilization prior to initial use and between patients. Although the cannulae are cared for in a similar way, the manufacturer recommends single use. It should be noted that the IPAS MVA Plus aspirator does not need to be high-level disinfected or to be sterile at the time of use.

There are several challenges associated with setting up MVA delivery services. These include: establishing sustainable procurement and resupply mechanisms for uterine evacuation instruments, contraceptives and essential drugs and supplies; improving contraceptive method provision, infection prevention and pain management practices; and ensuring that services are high quality, accessible and sustainable. Service providers may not have the expertise to manage associated sexual violence and post-abortion care service may be relatively expensive in settings with restrictive abortion laws.

The Appendix contains various resources for MVA training, organizing sustainable supplies and clinical guidelines.

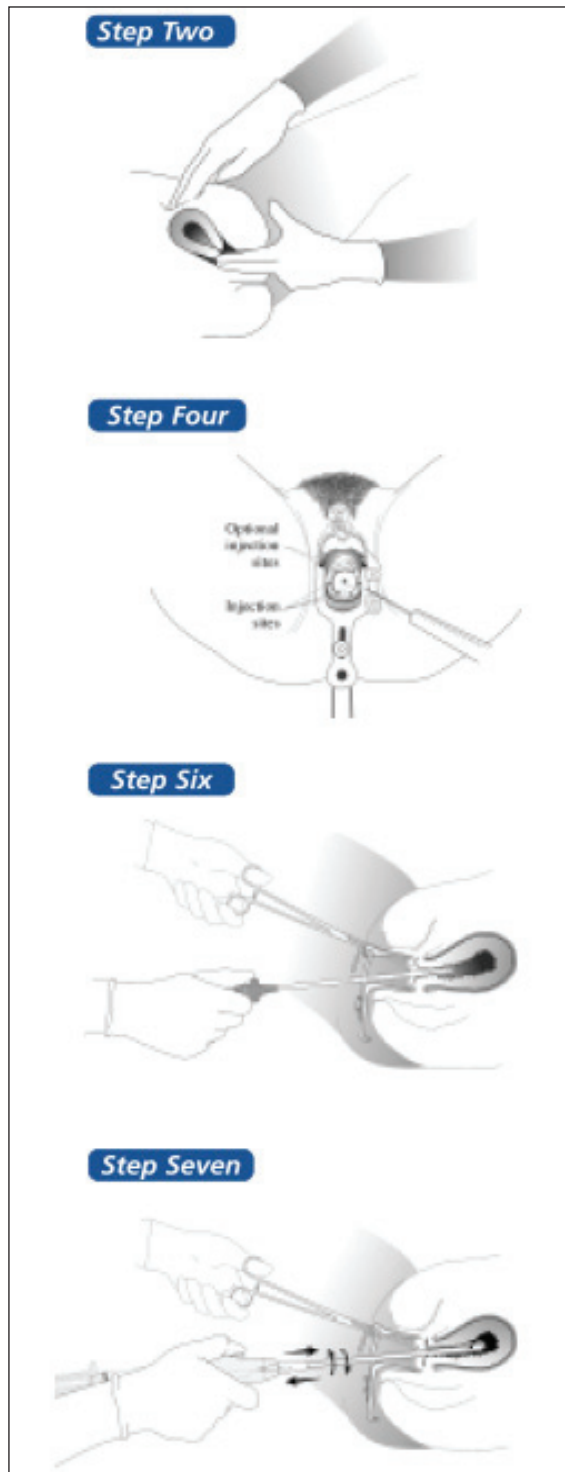
Other challenges include managing community expectations of partnerships and meeting the growing expectation that community partnerships and counseling can increase access to and use of reproductive health services, improve the quality of clinical interventions and even prevent health problems from occurring.

Healthcare providers knowledgeable about the anatomy and physiology, and with the ability to perform one or more uterine medical procedures (curettage, intrauterine contraceptive device insertion, EVA, MVA, hysteroscopy and endometrial biopsy) should be able to perform an MVA. There are several resources (manuals and videos) freely available, for healthcare providers to learn and continuously update their skills/knowledge about MVA and post-abortion care (see Appendix).

Women with complications of abortion need to be examined carefully and observed closely for progress during their treatment. Most cases can be managed as out-patient cases but those complicated by severe hemorrhage, sepsis, severe genital tract injuries, and bowel injuries will require inpatient treatment. For cases of sepsis, broad-spectrum parenteral antibiotics (intravenous antibiotics, which covers aerobic, anaerobic and Gram-negative bacteria) have to be commenced in the resuscitation phase of treatment (see Chapter 2). After uterine evacuation, women should be observed for increasing bleeding, lower abdominal pain or deteriorating general condition; these may suggest undiagnosed complications (uterine perforation, gangrene or incomplete evacuation), or wrong diagnosis (ectopic pregnancy or gestational trophoblastic disease). In the presence of sepsis, it is relatively easier to perforate the uterine. Accurate assessment of the uterine size, position and gestational, use of MVA rather than sharp curettage will reduce the risk of perforation.

Figure 2 shows the key steps in performing MVA. Details of how to perform the procedure, equipment, supplies required, pain management, processing the equipment after use are available in the *IPAS: International instruction booklet*.

Complications arising from miscarriages account for a significant contribution to maternal morbidity and mortality. This is worse in less developed regions of the world, and in those areas with low contraceptive prevalence and restrictive abortion laws. Medical abortion provides an opportunity to increase the options for safely managing unintended



**Figure 2** Manual vacuum aspiration procedure. The other steps are: Step 1, Diagnosis, counseling; Step 3, Pain management plan; Step 5, Hold the anterior cervix with a tenaculum and apply gentle traction. Source: <http://www.ipas.org> (Resources)

pregnancies in these settings. The MVA is a simple cost-effective safe method used as part of post-abortion care; all healthcare providers in resource-poor settings should be familiar with its use. This chapter has presented a review of abortion including evidence-based care of women with complications arising from it.

**REFERENCES**

1. Silver RM, Branch DW, Goldenberg R, *et al.* Nomenclature for pregnancy outcomes: time for a change. *Obstet Gynecol* 2011;118:1402–8
2. Farquharson RG, Jauniaux E, Exalto N. Updated and revised nomenclature for description of early pregnancy events. *Hum Reprod* 2005;20:3008–11
3. Royal College of Obstetricians and Gynaecologists (RCOG). The management of early pregnancy loss. Green-top guideline no. 25. London: RCOG, 2006
4. Exalto N, Christiansen OB, Farquharson RG, Jauniaux E. Early pregnancy failure: a review. *Eur Clin Obstet Gynaecol* 2006;2:171–9
5. Åhman E, Shah IH. New estimates and trends regarding unsafe abortion mortality. *Int J Gynecol Obstet* 2011; 115:121–6
6. World Health Organization (WHO). Unsafe abortion: global and regional estimates of the incidence of unsafe abortion and associated mortality in 2000, 4th edn. Geneva: WHO, 2004
7. Everett C. Incidence and outcome of bleeding before the 20th week of pregnancy: prospective study from general practice. *Br Med J* 1997;315:32–4
8. Brigham SA, Conlon C, Farquharson RG. A longitudinal study of pregnancy outcome following idiopathic recurrent miscarriage. *Hum Reprod* 1999;14:2868–71
9. Gemzell-Danielsson K, Ho PC, Gómez Ponce de León R, *et al.* Misoprostol to treat missed abortion in the first trimester. *Int J Gynecol Obstet* 2007; 99 (Suppl. 2): S182–5
10. Neilson JP, Gyte GM, Hickey M, *et al.* Medical treatments for incomplete miscarriage less than 24 weeks. *Cochrane Database Syst Rev* 2010;1:CD007223
11. Abbasi S, Jamal A, Eslamian L, Marousi V. Role of clinical and ultrasound findings in the diagnosis of retained products of conception. *Ultrasound Obstet Gynecol* 2008;32:704–7
12. Berer M. Medical abortion: issues of choice and acceptability. *Reprod Health Matters* 2005;13:25–34
13. World Health Organization. Medical methods for termination of pregnancy. Report of a WHO Scientific Group. *World Health Organ Tech Rep Ser* 1997;871:i-vii, 1–110
14. Grimes DA, Cates W Jr. Complications from legally-induced abortion: a review. *Obstet Gynecol Surv* 1979;34: 177–91
15. Say L, Kulier R, Gülmezoglu M, Campana A. Medical versus surgical methods for first trimester termination of pregnancy. *Cochrane Database Syst Rev* 2005;1:CD003037

16. Kulier R, Gülmezoglu AM, Hofmeyr GJ, *et al.* Medical methods for first trimester abortion. *Cochrane Database Syst Rev* 2004;1:CD002855
17. Blum J, Winikoff B, Gemzell-Danielsson K, *et al.* Treatment of incomplete abortion and miscarriage with misoprostol. *Int J Gynecol Obstet* 2007;99(Suppl. 2):S186–9
18. Weeks A, Faúndes A. Misoprostol in obstetrics and gynecology. *Int J Gynecol Obstet* 2007;99(Suppl. 2):S156–9
19. Ho PC, Blumenthal PD, Gemzell-Danielsson K, *et al.* Misoprostol for the termination of pregnancy with a live fetus at 13 to 26 weeks. *Int J Gynecol Obstet* 2007;99(Suppl. 2):S178–81
20. Postabortion Care Consortium Community Task Force. Essential Elements of Postabortion Care: An Expanded and Updated Model. No. 2, Special Supplement. Post-abortion Care Consortium, 2002
21. Kulier R, Fekih A, Hofmeyr GJ, Campana A. Surgical methods for first trimester termination of pregnancy. Update. *Cochrane Database Syst Reviews* 2001;4:CD002900
22. Allen RH, Fortin J, Bartz D, *et al.* Women's preferences for pain control during first-trimester surgical abortion: a qualitative study. *Contraception* 2012;85:413–18
23. Renner RM, Jensen JT, Nichols MD, Edelman A. Pain control in first trimester surgical abortion. *Cochrane Database Syst Rev* 2009;2:CD006712
24. Wu J, Chaplin W, Amico J, *et al.* Music for surgical abortion care study: a randomized controlled pilot study. *Contraception* 2012;85:496–502
25. Guttmacher Institute. In brief: fact sheet; facts on induced abortion worldwide. Available at: [http://www.guttmacher.org/pubs/fb\\_IAW.html](http://www.guttmacher.org/pubs/fb_IAW.html)
26. World Health Organization. *Clinical guidelines for emergency treatment of abortion complications*. WHO/FHE/MSM/94.1. Geneva: WHO, 1994
27. World Health Organization. *The Prevention and Management of Unsafe Abortion*. Report of a Technical Working Group. Geneva, 12–15 April, 1992. Geneva: Division of Family Health WHO, 1993
28. Grimes AD, Benson J, Singh S, *et al.* *Unsafe abortion: the preventable pandemic*. Lancet Sexual and Reproductive Health Series. Geneva: WHO, 2006.
29. Nanda K, Peggia A, Grimes D, *et al.* Expectant care versus surgical treatment for miscarriage. *Cochrane Database Syst Rev* 2006;2:CD003518
30. Tang OS, Gemzell-Danielsson K, Ho PC. Misoprostol: pharmacokinetic profiles, effects on the uterus and side-effects. *Int J Gynecol Obstet* 2007;99(Suppl. 2):S160–7

## APPENDIX

### Useful resources for post-abortion care

- USAID: <http://www.postabortioncare.org/>
- USAID: <http://www.postabortioncare.org/training/training4.shtml>
- IPAS: <http://www.ipas.org> (Abortion topics)
- IPAS University: <http://www.ipasu.org>
- Engender health: <http://www.engenderhealth.org/index-main.php> (Postabortion care)
- WHO 1992: Clinical guidelines for emergency treatment of abortion complications. Geneva: WHO, 1992

### Manual vacuum aspirator and procedure

- Sustainable supplies: [http://www.ipas.org/Topics/Abortion\\_Technologies.aspx](http://www.ipas.org/Topics/Abortion_Technologies.aspx)
- Women Care Global: Aspirators. <http://www.womancareglobal.org> (Products, Pregnancy Management)
- IPAS International instruction booklet: <http://www.iawg.net/resources> (Tool kit)