

**AMERICAN SOCIETY FOR REPRODUCTIVE MEDICINE**

# ECTOPIC PREGNANCY

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*A Guide for Patients*



**PATIENT INFORMATION SERIES**

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# ECTOPIC PREGNANCY

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## *A Guide for Patients*

*A glossary of italicized words is located at the end of this booklet.*

### INTRODUCTION

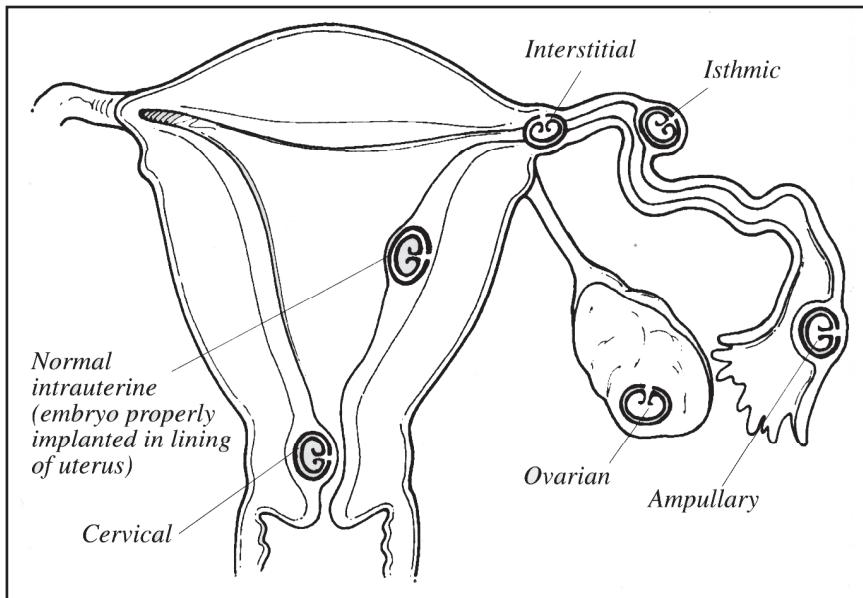
The diagnosis of an *ectopic pregnancy* is usually a surprise and is often emotionally traumatic. Many women are in the midst of enjoying their pregnancy when they receive the diagnosis. Some women diagnosed with an ectopic pregnancy do not even know they are pregnant and suddenly must contemplate the possibility of major surgery or medical treatment. This booklet is designed to provide information on the diagnosis and treatment of ectopic pregnancy.

### ***Definition***

Ectopic pregnancies account for one to two percent of all conceptions. An ectopic pregnancy is an early embryo (fertilized egg) that has implanted outside of the *uterus*, the normal site for implantation. In normal conception, the egg is fertilized by the sperm in the *fallopian tube*. The resulting embryo travels through the tube and reaches the uterus three to four days later. However, if the fallopian tube is blocked or damaged and unable to transport the embryo to the uterus, the embryo may implant in the lining of the tube, resulting in an ectopic pregnancy. The fallopian tube cannot support the growing embryo. After several weeks the tube may rupture and bleed, resulting in a potentially serious situation.

Ninety-five percent of ectopic pregnancies implant in the fallopian tube, but they can also occur in the *cervix*, *ovary*, or even within the abdomen (*abdominal pregnancy*) (Figure 1). Abdominal pregnancies are extremely rare and may often progress quite late into the pregnancy before they are discovered. Viable fetuses delivered by *laparotomy* have, on rare occasions, been reported to result from abdominal pregnancies.

A commonly asked question from women who have ectopic pregnancies, particularly if they have been attempting to conceive for a long period of time, is whether the pregnancy can be removed from the tube and then transplanted into the uterus where it might grow normally. Unfortunately, this is not possible with present medical science.



**Figure 1.** Female reproductive system showing sites of ectopic pregnancy and normal intrauterine pregnancy.

## Causes

Women with pre-existing tubal damage are more likely to develop an ectopic pregnancy. In fact, 50 percent of ectopic pregnancies are associated with some degree of tubal disease. Fallopian tube damage commonly results from prior pelvic infection, such as gonorrhea, chlamydia, or other *sexually transmitted diseases*. Tubal disease may also occur as a result of *endometriosis, appendicitis*, previous pelvic surgery, or exposure to *diethylstilbestrol (DES)*. Women who conceive after having a *tubal ligation* for sterilization, reversal of a tubal ligation, or any other type of tubal surgery also have a higher risk of having an ectopic pregnancy. Women who conceive as a result of *fertility drugs* or *in vitro fertilization (IVF)* have a slightly higher risk of having an ectopic pregnancy. For more information on tubal damage and surgery, refer to the ASRM patient information booklet titled *Tubal Factor Infertility*.

Sometimes there is no apparent explanation for why an ectopic pregnancy has occurred. However, it is known that once a woman has had an ectopic pregnancy, she has a higher chance of having another one and should be monitored carefully if another pregnancy is attempted or suspected.

## Symptoms

Delayed or abnormal menstruation can be an early sign of an ectopic pregnancy. If pregnancy is confirmed, early abnormal levels of *human chorionic*

*gonadotropin (hCG)*, pelvic pain, and/or irregular bleeding in the first weeks of pregnancy can indicate an ectopic pregnancy. If a woman knows or suspects that she is pregnant, and has experienced pelvic or lower abdominal pain, she should consult her physician, even if the pain decreases in severity or stops altogether. Sometimes an ectopic pregnancy is suspected when an *ultrasound* does not show a pregnancy inside the uterus.

Until recently, ectopic pregnancies were often not diagnosed until six to eight weeks into the pregnancy, when the patient was experiencing pelvic pain, irregular vaginal bleeding, possible internal bleeding, and a tender feeling in the pelvis. Under these circumstances, this represented a life-threatening emergency, and major surgery (*laparotomy*) was required to remove the pregnancy and control bleeding. Fortunately, most ectopic pregnancies are now identified much earlier, often before the patient is even aware of an acute problem. This is largely due to the availability of sensitive hormonal testing and ultrasound examinations.

## ***Diagnosis***

The tests that are often used to diagnosis an early ectopic pregnancy include the measurement of human chorionic gonadotropin (hCG) and/or *progesterone* levels in the bloodstream, ultrasound, *laparoscopy*, or *dilation and curettage (D&C)*.

## ***Human Chorionic Gonadotropin (hCG)***

In a normal pregnancy, the blood level of hCG, a hormone produced by the placenta, should double approximately every 48 hours. If an appropriate increase does not occur, this suggests that the pregnancy may not be healthy and may result in a *miscarriage*. Slowly increasing hCG levels can also occur in an ectopic pregnancy. Repeated measurements of hCG blood levels may be necessary before the correct diagnosis can be made.

## ***Progesterone***

Progesterone levels in the bloodstream rise very early in the course of a pregnancy. Low levels of this hormone are frequently associated with an abnormal pregnancy, such as an ectopic pregnancy or an impending miscarriage. However, progesterone levels alone do not always predict the location or the viability of a pregnancy, and are not routinely used to diagnose ectopic pregnancy.

## ***Ultrasound Examinations***

Ultrasound can be used in the first three to five weeks after conception to determine whether or not a pregnancy is inside the uterine cavity. *Transvaginal ultrasound* is much more sensitive than abdominal ultrasound for this purpose.

Ultrasound scans can also show fluid or blood in the abdominal cavity, suggesting bleeding from an ectopic pregnancy. Sometimes, the use of ultrasound, combined with hCG and/or progesterone blood level measurements, can confirm the diagnosis of an ectopic pregnancy without the need for a laparoscopy or D&C. Oftentimes, however, it is not possible to visualize an ectopic pregnancy with ultrasound.

## **Laparoscopy**

In some cases a laparoscopy is required to confirm the diagnosis of an ectopic pregnancy. Sometimes, laparoscopy can also be used to treat the ectopic pregnancy. Laparoscopy is an outpatient surgical procedure requiring general anesthesia. A small telescope called a *laparoscope* is placed into the abdominal cavity through a small incision in the navel. If necessary, the doctor can usually remove the ectopic pregnancy by placing special instruments through the laparoscope or through small incisions above the pubic area. An overnight hospital stay is usually not necessary following laparoscopy. For more information on laparoscopy, refer to the ASRM patient information booklet titled *Laparoscopy and Hysteroscopy*.

## **Dilation and Curettage (D&C)**

If a patient's blood hormonal levels and ultrasounds are consistent with a nonviable pregnancy, an embryo that has not successfully implanted in the uterine wall, the physician may choose to gently scrape out the lining of the uterus. This operation, known as a D&C (dilation and curettage), can be performed under anesthesia either in the hospital or as an outpatient procedure. A patient's hCG levels will drop sharply following evacuation of a miscarriage. The tissue removed from the uterus is also examined carefully by a pathologist. If pregnancy tissue is seen, an ectopic pregnancy is very unlikely, although very rarely a double pregnancy, one in the uterus and the other in the fallopian tube (called a heterotopic pregnancy) can occur. If there is no evidence of pregnancy tissue, the presence of and early diagnosis of an ectopic pregnancy must be considered.

# **TREATMENT**

With early diagnosis of an ectopic pregnancy, medical (non-surgical) treatment with the drug methotrexate can be used. To be a candidate for methotrexate therapy, a patient needs to be in stable condition with no evidence of internal bleeding or severe pain. She also needs to maintain communication with her physician during the treatment protocol and return for follow-up blood tests after treatment.

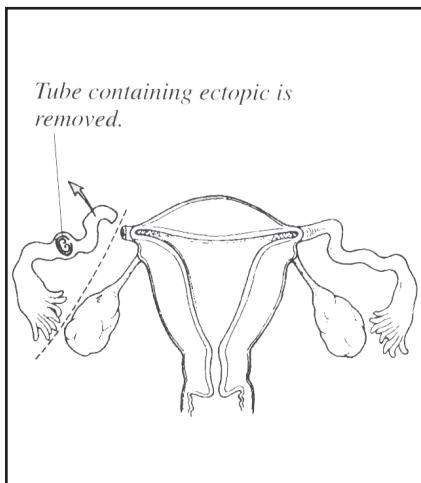
Methotrexate is a drug that was initially used to treat unique cancers, some of which were derived from placental tissue. It is very effective in destroying ectopic pregnancy tissue and allowing it to be re-absorbed by the body. Methotrexate is given as a single intramuscular shot or as a series of shots and

pills over several days. Most early ectopic pregnancies can be successfully treated with methotrexate, often leaving the tube open. Success is largely based on the size of the ectopic pregnancy seen on the ultrasound exam and the level of hCG found on the blood test. Women with large ectopic pregnancies, rapidly rising and/or high levels of hCG ( $> 10,000$  IU/L) are less likely to respond to single dose methotrexate therapy and, therefore, may be considered candidates for multiple dose methotrexate regimens or surgical treatment. If methotrexate is successful, hCG levels should decline to zero over the next two to six weeks. If the hCG levels do not fall, methotrexate treatment may be repeated or the pregnancy may be removed surgically.

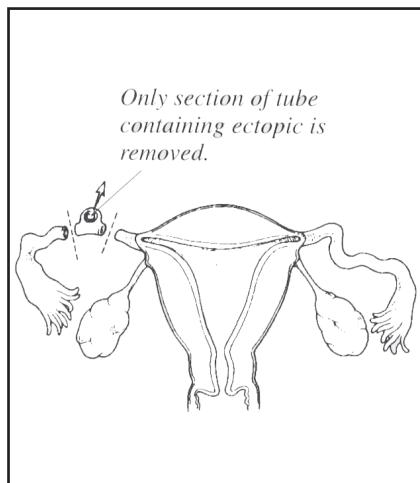
There are no known long-term side effects from use of methotrexate. The short-term side effects are few. The drug can cause temporary *ulcers* in the mouth and other gastrointestinal sites, and can cause temporary changes in liver function. Rare complications include pneumonia. Decreased *platelet* production, another rare complication, can cause bleeding within two weeks after the injection. Any woman with changes in liver blood tests, anemia (low blood counts), or platelet disorders cannot take methotrexate. A patient may experience some abdominal pain for a few days due to the resorption of the ectopic pregnancy. Any severe pain needs to be reported to her physician. Women should limit sun exposure during treatment, as methotrexate can cause sensitivity to sunlight and sunburn may occur. When being treated with methotrexate, women should not drink alcohol or take vitamins containing folic acid (folate).

## **Surgical Treatment**

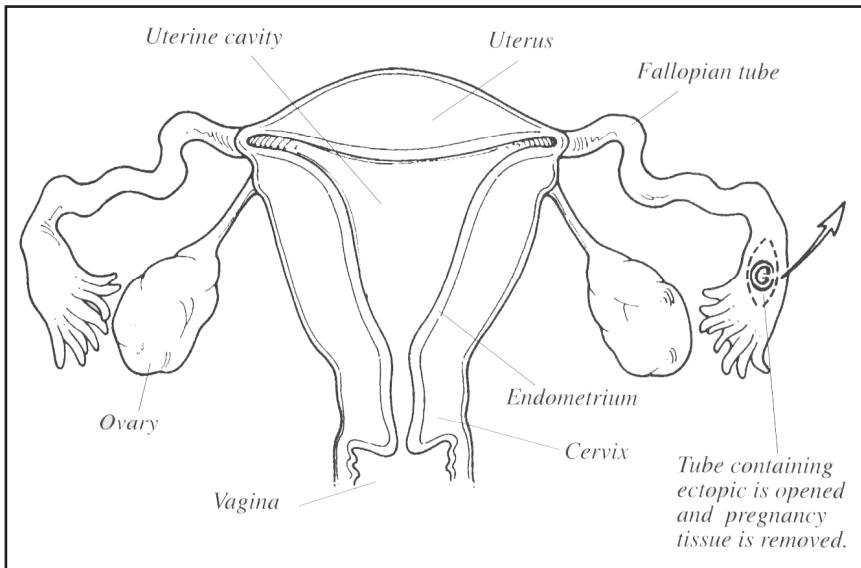
Until the last decade, ectopic pregnancies were usually treated by *total salpingectomies* (removal of the entire tube: Fig 2a) via laparotomy (major surgery). Now most surgeries for ectopic pregnancies are performed via laparoscopy. Laparotomy is usually reserved for those ectopic pregnancies that have ruptured, causing severe internal bleeding. If the ectopic pregnancy is diagnosed early, before it ruptures through the tube, a laparoscopic *salpingostomy* may be performed. In this procedure, the fallopian tube is opened and the pregnancy tissue is removed while leaving the tube in place (Fig 3). The tube subsequently heals on its own. There is one drawback to this procedure: some of the ectopic tissue may remain and continue to grow. This occurs in five to 15 percent of cases and may be treated by surgically removing the tube or by using methotrexate therapy. A *partial salpingectomy* (sometimes called a segmental resection, where a middle segment of the tube is removed; Fig 2b) may be performed when the ends of the tubes (the *fimbriae*) appear healthy and the ectopic pregnancy is small. If only a small portion of the tube is removed, the tube may be rejoined later using *microsurgery*. If the fallopian tube is extremely damaged, the ectopic pregnancy is large, or the woman is bleeding excessively, a total salpingectomy is performed. In rare cases when the ectopic pregnancy involves the ovary, the ovary is removed along with the tube (Fig 4).



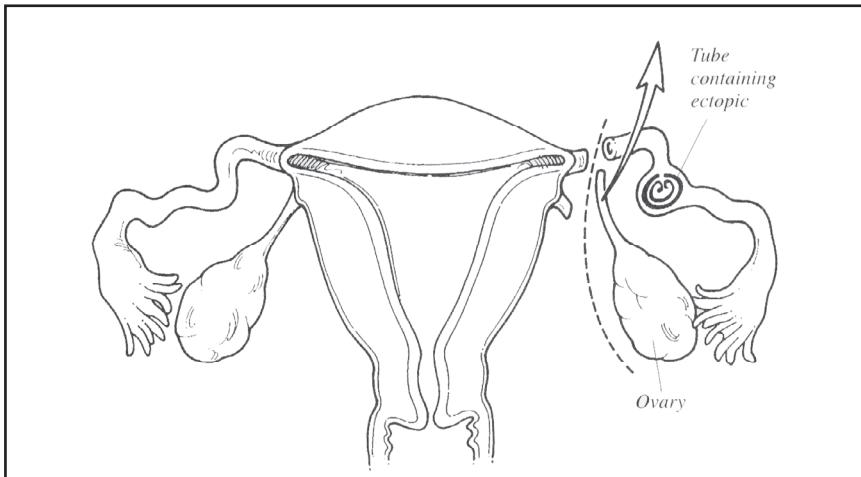
**Figure 2a.** Total salpingectomy. Entire tube is removed.



**Figure 2b.** Partial salpingectomy. Tube may be rejoined later to preserve fertility.



**Figure 3.** In salpingostomy, the fallopian tube is opened and the ectopic pregnancy is removed.



**Figure 4.** In salpingo-oophorectomy, total removal of the tube and ovary is necessary.

## ***Considering Operative Laparoscopy Versus Laparotomy for Ectopic Pregnancy***

Gynecologic, reproductive, or tubal operations historically required a laparotomy using either a “bikini” or “up and down” skin incision several inches long. Patients usually remained in the hospital two to five days following surgery and returned to work in two to six weeks, depending on the level of physical activity required. Today, many of these operations can be performed using operative laparoscopy, which generally uses two to four smaller skin incisions approximately one-quarter to one-half inch long. Following operative laparoscopy, patients are generally able to go home the day of surgery and recover more quickly, returning to full activities in three to seven days.

Notwithstanding the advantages of operative laparoscopy, not all procedures can be performed with this technique. Emergency situations with internal bleeding may require immediate laparotomy. Some types of operations may also be too risky to perform laparoscopically, while in others it is not clear that laparoscopy yields results as good as those by laparotomy. Finally, the surgeon’s training, skill, and experience also play a significant role in deciding whether operative laparoscopy or laparotomy should be used. When considering a pelvic operation, the patient and doctor should discuss the pros and cons of performing a laparotomy vs. an operative laparoscopy, including the surgical risks.

## OUTCOME

There is an increased chance of being infertile after an ectopic pregnancy. In addition, the chance of having another ectopic pregnancy is increased. Fortunately, over half of women who experience an ectopic pregnancy will have a healthy baby sometime in the future. It is often recommended that women wait three to six months after treatment of an ectopic pregnancy before attempting pregnancy. Since an ectopic pregnancy is often due to pre-existing tubal disease, and these patients are at an increased risk for infertility, many physicians may consider further evaluation in those women who want a future pregnancy. Physicians may recommend that women who have had multiple recurrent ectopic pregnancies undergo in vitro fertilization (IVF). While IVF reduces the risk of ectopic pregnancy for these women, there is still approximately a five percent chance of a tubal pregnancy. For more information on IVF, refer to the ASRM patient information booklet titled *Assisted Reproductive Technologies*.

## *Emotional Aspects*

Ectopic pregnancy is a physically and emotionally traumatic experience. In addition to experiencing the loss of a pregnancy, women may fear the loss of future fertility. Feelings of grief and loss are normal. Sadness, anger, self-blame, guilt, and depression are part of the grieving process, and need to be acknowledged and expressed. It can be helpful to share these feelings in a support group, such as RESOLVE or SHARE, or through counseling. Time is necessary for both physical and emotional healing before attempting another pregnancy. For more information on these support groups, consult the Resources section on the next page.

## SUMMARY

Ectopic pregnancy refers to any pregnancy implanted outside the uterus, usually in the fallopian tube. Early diagnosis is facilitated by the use of sensitive hormonal tests, ultrasound exams, laparoscopy, and/or D&C. Modern surgical and medical treatments frequently allow for avoidance of extensive surgery and preservation of the involved fallopian tube. Although the risk of having another ectopic pregnancy is increased, many women will successfully conceive and have children in the future, either naturally or with the aid of an assisted reproductive technology such as IVF.

## **RESOURCES**

RESOLVE, Inc.  
1310 Broadway  
Somerville, Massachusetts 02144-1731  
(617) 623-0744

American Fertility Association  
666 5th Avenue, Suite 278  
New York, NY 10103-3777  
888-917-3777

SHARE (Source of Help in Airing and Resolving Experiences)  
St. Joseph's Hospital  
300 First Capitol Drive  
St. Charles, Missouri 63301-2893  
(314 ) 947-6164

### **Let Us Know What You Think**

Email your comments on this booklet to [asrm@asrm.org](mailto:asrm@asrm.org). In the subject line, type “Attention: Patient Education Committee”.

## GLOSSARY

**Abdominal pregnancy.** An ectopic (extrauterine) pregnancy that has implanted on structures in the abdomen other than the uterus, fallopian tubes, or ovaries. It usually implants on tissue in the abdomen known as the omentum.

**Appendicitis.** A condition where the appendix (a tubular structure attached to the large colon) becomes infected and inflamed and can be associated with the formation of adhesions in the proximity of the fallopian tube.

**Cervix.** The lower narrow end of the uterus that connects the uterus to the vagina.

**Diethylstilbestrol (DES).** A synthetic hormone formerly given during pregnancy to prevent miscarriage. Women born from treated pregnancies can have abnormalities of the reproductive system, including an increased risk of ectopic pregnancy.

**Dilation and curettage (D&C).** An outpatient surgical procedure during which the cervix is dilated and the lining of the uterus is scraped out. The tissue is often microscopically examined for the presence of abnormality or pregnancy tissue.

**Ectopic pregnancy.** A pregnancy that implants outside of the uterus, usually in the fallopian tube. The tube may rupture or bleed as the pregnancy grows and present a serious medical situation.

**Embryo.** The earliest stage of human development arising after the union of the sperm and egg (fertilization).

**Endometriosis.** A condition where patches of endometrial-like tissue develop outside the uterine cavity in abnormal locations such as the ovaries, fallopian tubes, and abdominal cavity. Endometriosis can grow with hormonal stimulation, causing pain, inflammation and scar tissue. It also may be associated with pelvic pain and infertility.

**Fallopian tube.** A pair of hollow tubes attached one on each side of the uterus through which the egg travels from the ovary to the uterus. Fertilization usually occurs in the fallopian tube. The fallopian tube is the most common site of ectopic pregnancy.

**Fertility drugs.** Drugs that stimulate the ovaries to produce and mature eggs so that they can be released at ovulation.

**Fimbriae.** The flared end (finger-like) of the fallopian tube that sweeps over the surface of the ovary and helps to direct the egg into the tube.

**Human chorionic gonadotropin (hCG).** This hormone is produced by the placenta. Its detection is the basis of most pregnancy tests.

**Implantation.** The process whereby an embryo embeds in the uterine lining in order to obtain nutrition and oxygen. Sometimes an embryo will implant in areas other than the uterus, such as in a fallopian tube. This is known as an ectopic pregnancy.

**In vitro fertilization (IVF).** A method of assisted reproduction that involves combining an egg with sperm in a laboratory dish. If the egg fertilizes and begins cell division, the resulting embryo is transferred into the woman's uterus where it will hopefully implant in the uterine lining and further develop. IVF may be performed in conjunction with medications that stimulate the ovaries to produce multiple eggs in order to increase the chances of successful fertilization and implantation. IVF bypasses the fallopian tubes and is often the treatment of choice for women who have badly damaged or absent tubes.

**Laparoscope.** A thin, lighted, telescope-like viewing instrument that is usually inserted through the navel into the abdomen to examine the contents of the pelvic and abdominal cavities. Other small incisions may also be made, and additional instruments inserted to facilitate diagnosis and allow surgical correction of pelvic abnormalities. The laparoscope can be used as both a diagnostic and operative instrument.

**Laparoscopy.** The insertion of a long, thin, lighted, telescope-like instrument called a laparoscope into the abdomen through an incision usually in the navel to visually inspect the organs in the abdominal cavity. Other small incisions may also be made, and additional instruments inserted, to facilitate diagnosis and allow surgical correction of abnormalities. The surgeon can sometimes remove scar tissue and open closed fallopian tubes during this procedure.

**Laparotomy.** Major abdominal surgery through an incision in the abdominal wall.

**Methotrexate.** A medication that destroys pregnancy-related tissue and hastens re-absorption of this tissue in a woman with an ectopic pregnancy.

**Microsurgery.** A type of surgery which uses magnification, meticulous technique, and fine suture material in order to get precise surgical results. Microsurgery is important for certain types of tubal surgery in the female, as well as for vasectomy reversal in the male.

**Miscarriage.** The naturally occurring expulsion of a nonviable fetus and placenta from the uterus, also known as spontaneous abortion or pregnancy loss.

**Ovaries.** The two female sex glands in the pelvis, located one on each side of the uterus. The ovaries produce eggs and hormones including estrogen, progesterone, and androgen.

**Partial salpingectomy.** An operation in which the section of a fallopian tube containing an ectopic pregnancy is removed. This procedure attempts to preserve most of the tube for subsequent re-attachment using microsurgery in order to achieve future fertility.

**Platelets.** Circulating blood components that aid in blood clotting and prevention of bleeding.

**Pneumonia.** Lung inflammation.

**Progesterone.** A female hormone secreted by the corpus luteum after ovulation during the second half of the menstrual cycle (luteal phase). It prepares the lining of the uterus (endometrium) for implantation of a fertilized egg and also allows for complete shedding of the endometrium at the time of menstruation. In the event of pregnancy, the progesterone level remains stable beginning a week or so after conception.

**Salpingectomy.** An operation in which one or both of the fallopian tubes are removed.

**Salpingo-oophorectomy.** Removal of a fallopian tube and ovary together.

**Salpingostomy.** A surgical procedure in which the wall of the fallopian tube is opened and the ectopic pregnancy is removed. The tubal incision heals spontaneously.

**Sexually transmitted disease.** An infection, such as chlamydia or gonorrhea, that is transmitted by sexual activity. In the female, some STDs can cause pelvic infections and lead to infertility by damaging the fallopian tubes and increasing the risk of ectopic pregnancy. In the male, STDs can cause blockage of the ductal system that transports sperm.

**Transvaginal ultrasound.** An imaging technique in which a smooth cylindrical probe that uses sound waves to view organs on a video screen is placed in the vagina.

**Tubal ligation.** A surgical procedure in which the fallopian tubes are clamped, clipped, or cut to prevent pregnancy.

**Ulcer.** A lesion (sore) on the surface of the skin or on a mucous surface, usually inflamed. As an occasional side effect of methotrexate therapy, temporary ulcers may form in the mouth.

**Ultrasound.** A picture of internal organs produced by high frequency sound waves viewed as an image on a video screen; used to monitor growth of ovarian follicles, retrieve eggs, or monitor growth and development of a fetus.

Ultrasound can be performed either abdominally or vaginally.

**Uterus (womb).** The hollow, muscular female organ in the pelvis in which an embryo implants and grows during pregnancy. The lining of the uterus, called the endometrium, produces the monthly menstrual blood flow when there is no pregnancy.

## NOTES



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