Embryonic & Fetal Development

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Acknowledgments

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Meeting the Requirements of the SC Women's Right to Know Act

Embryonic & Fetal Development is one of two documents available to you as part of the Women's Right to Know Act (SC Code of Laws: 44-41-310 et seq.). If you would like a copy of the other document, ***Directory of Services for Women & Families in South Carolina*** *(ML-017048)*, you may place an order through the DHEC Materials Library at http://www.scdhec.gov/Agency/EML or by calling the Care Line at 1-855-4-SCDHEC (1-855-472-3432).

If you are thinking about terminating a pregnancy, the law says that you must certify to your physician or his/her agent that you have had the opportunity to review the information presented here at least 24 hours before terminating the pregnancy. This certification is available on the DHEC website at www.scdhec.gov/Health/WRTK or from your provider. You must give this signed certification statement indicating the time and date you received these materials to your attending physician or his/her agent. If you would like additional information about these publications, please contact the DHEC Care Line at 1-855-4-SCDHEC (1-855-472-3432).

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Table of Contents

I. Understanding Gestational Age

What is Gestational Age?

You've probably heard people say that a pregnancy typically lasts about nine months (or 38 weeks) from the time of conception until a full-term infant is delivered. But in the U.S., healthcare professionals typically calculate the length of a pregnancy by gestational age. Gestational age is the number of weeks that have passed since the first day of a woman's last normal menstrual period. Thus, a full-term pregnancy would be 40 weeks long.

Especially in the early stages of pregnancy, a physician can confirm the gestational age of your pregnancy through a physical exam and ultrasound.

What is Conceptional Age?

Under South Carolina's abortion law, the first trimester is defined by conceptional age. Gestational age is not the same thing as conceptional age. Conceptional age is how much time has passed since actual conception (fertilization). Conception cannot take place until you ovulate, and that typically happens about 14 days after the start of your monthly period.

So, conceptional age will always be about 14 days younger than gestational age. The average length of a full-term pregnancy is about 280 days, or 40 gestational weeks from the first day of the last period. The average length of a pregnancy from the time of conception is about 266 days, or 38 conceptional weeks from the day of conception.

How to Calculate Gestational Age

Step 1. Find the date of the first day of your last menstrual period on a calendar.

Step 2. Count the number of full weeks that have passed from the date in Step #1 to today's date. For example, if your last menstrual period started on July 1st and today's date is August 1st, the gestational age is four weeks.

Another Way to Know Gestational Age: Ultrasound

Your healthcare provider can also use ultrasound to figure out the estimated due date. Ultrasound is a technique used by healthcare professionals to create an image of internal body parts or to monitor a pregnancy. The image is created from high frequency sound waves.

Ultrasound uses the size of the fetus to determine the gestational age (the time that has passed since the first day of your last period).

You Can Request to See an Ultrasound

If you are pregnant and considering an abortion, the physician who will perform the procedure may do an ultrasound to confirm gestational age. If an ultrasound is performed, you have the right to view the ultrasound image. In fact, by law, the physician or the physician's assistant must ask you if you want to view the image. However, you do not have to view the ultrasound.

Crisis pregnancy centers do not perform abortions but some do offer free ultrasounds for women who are pregnant and considering abortion.

If you do decide to receive an ultrasound and to seek an abortion, be aware that there is a required one hour wait time between getting an ultrasound and terminating a pregnancy (except when medically necessary).

II. Role of Genetics

Human beings are born with 46 chromosomes. These are thread-like structures that carry the genetic instructions that over time develop a one-celled embryo into a 100 trillion-cell human adult.

Each person inherits 23 chromosomes from their biological mother and 23 chromosomes from their biological father.

Genetically, each person is 99.9 percent identical to the 6 billion other humans on the planet. But that seemingly small variation in our genetic makeup - the 0.1 percent - can have dramatic influences on physical and mental health and appearance. Research suggests that genetics plays a role in our personalities.

One important thing you can do for your health and your family's health is to collect your family health history. Knowing what diseases have affected your blood relatives can help your healthcare provider gauge your risk for certain diseases and suggest ways to reduce that risk.

III. Stages of Pregnancy by Two Week Intervals

Now that you know the gestational age of your pregnancy and have read the statement on genetics, you may, if you like, review a brief description of embryonic or fetal development for gestational age. However, you do not have to read the description of embryonic or fetal development for gestational age.

If you decide to terminate your pregnancy, you must sign a statement verifying that you were given the opportunity to review this information on embryonic and fetal development at least 24 hours in advance of pregnancy termination. This statement is available at the clinic and also on the DHEC website at www.scdhec.gov/Health/WRTK.

Below, we have listed each two-week period under the appropriate trimester (as defined under South Carolina's abortion law). Each two-week period is identified two ways:

1. By ***gestational age***—the length of time that has passed since the first day of your last menstrual period.

2. By ***conceptional age***—the length of time that has passed since actual conception. Conceptional age will always be about two weeks younger than gestational age. Under South Carolina's abortion laws, trimesters are defined by conceptional age.

A trimester is approximately 13 weeks, or one third of a typical full-term pregnancy.

First Trimester

0-2 Weeks from Conception

(3-4 weeks after the last menstrual period)

The egg is released from the ovary. It is fertilized in the fallopian tube by the sperm. The fertilized egg starts to divide and forms a ball of cells. The ball of cells digs into the lining of the uterus.

- The ball of cells begins to form layers and fluid-filled spaces.
- The earliest part of the afterbirth begins to form.
- At this point in its growth, the ball of cells is called an "embryo."
- The embryo grows to a length of 0.2 mm (about $^{1}/_{100}$ inch).

3-4 Weeks from Conception

(5-6 weeks after the last menstrual period)

The embryo changes from a flat disc to a curved, C-shaped form. Organs begin forming. At this point, the menstrual period is missed.

- A tube forms along the embryo's length. This will grow into the brain and spinal cord.
- The heart starts as a tube, which begins to beat as it grows.
- Simple structures form on the sides of the head. They will become eyes and ears as time goes on.
- Limb buds, which look like bumps, start to form. Later they will become arms and legs.
- The embryo grows to a length of 6 mm (about ¼ inch).

5-6 Weeks from Conception

(7-8 weeks after the last menstrual period)

About half of the embryo's length is the head, due to the rapid growth of the brain. The heart starts to form the normal four chambers. A heartbeat can be seen on ultrasound.

- The eyes and ears move toward their normal places on the head.
- Kidneys begin to form.
- "Rays" appear in the limbs, which will later form fingers and toes.
- The umbilical cord joins the embryo and the placenta (or afterbirth).
- The embryo is about 14 mm (½ inch) long.
- The neural tube that becomes the brain and spinal cord closes.

7-8 Weeks after Conception

(9-10 weeks after the last menstrual period)

The embryo changes shape as the face forms. It begins to straighten out from its C-shape. The small tail bud begins to go away. All of the essential organs, including the basic parts of the brain and the heart are now formed.

- There are fingers on the hands.
- The toes are almost formed.
- There are eyelids over the eyes, but they cannot open yet.
- Nipples can be seen and the first hair buds form.
- Muscles begin to form. Early bones are formed. The arms can bend at the elbow.
- The intestines grow rapidly.
- The embryo is about 31 mm (1¼ inches) long.

9-10 Weeks after Conception

(11-12 weeks after the last menstrual period)

By this time, all the main body parts are formed and present. The embryo now is called a "fetus". Growth becomes most important. Fetal length is measured from the top of the head to the curve of the rump (crown-rump) length.

- The ears move up from around the neck to their normal position.
- Fetal movements and heartbeat can be seen on ultrasound.
- Various glands begin to work.
- The kidneys begin to make urine.
- The crown-rump length is 61 mm (about 2⅓ inches).
- The fetus weighs 14 grams (under one ounce).

11-12 Weeks after Conception

(13-14 weeks after the last menstrual period)

Often, at this point, the sex of the fetus can be seen. The fetus begins to swallow fluid from the amniotic sac (bag of waters). The fluid is replaced with urine made by the kidneys. The placenta is fully formed.

- Blood cells are made in the bone marrow.
- The neck can be clearly seen between the head and body.
- The crown-rump length is 86 mm (about 3½ inches).
- The fetus weighs 45 grams (about an ounce and a half).

Second Trimester

13-14 Weeks after Conception
(15-16 weeks after the last menstrual period)

The fetal head is still large as the body straightens out. The arms and legs are formed, and can move and bend.

- Sex organs are almost fully formed.
- Toenail and fingernail growth begins.
- The eyes move forward. The ears reach normal position. Now the face is well formed.
- Tooth buds may appear for the baby teeth.
- The crown-rump length is 120 mm (about 4¾ inches).
- The fetus weighs 110 grams (about 4 ounces).
- The eyelids close.

15-16 Weeks after Conception
(17-18 weeks after the last menstrual period)

Some women begin to feel the first fetal movements, called “quickening.” Growth begins to speed up. The legs grow longer, so the fetal head seems less large. Slow fetal eye movements can be seen by ultrasound. The mouth begins to make sucking motions.

- The bones gain calcium at a rapid rate.
- The ears stand out from the head.
- The crown-rump length reaches 140 mm (about 5½ inches).
- The fetus weighs 200 grams (about 7 ounces).
- The skin is almost transparent.
- The fetus may sleep and awaken regularly.

17-18 Weeks after Conception
(19-20 weeks after the last menstrual period)

Many women feel fetal movement or “quickening” by this time in pregnancy. The fetal skin is covered by something called “vernix caseosa”. Vernix caseosa looks a little like cream cheese. This is about the halfway point of a normal pregnancy.

- A very fine hair called “lanugo” covers the fetal body.
- The crown-rump length is 160 mm (about 6¼ inches).
- The fetus weighs 320 grams (about 7 ounces).

19-20 Weeks after Conception
(21-22 weeks after the last menstrual period)

The skin is red and wrinkled. Blood vessels can be seen very clearly beneath it.

- Eyebrow and eyelashes start to form.
- Fingerprints begin to form.
- The crown-rump length is 190 mm (about 7¾ inches).
- The fetus weighs 460 grams (just over a pound).

21-22 Weeks after Conception
(23-24 weeks after the last menstrual period)

Fetal weight gain is fast during this time. Rapid eye movements can be seen by ultrasound.

- Lung growth reaches the point where some gas exchange sacs are formed.
- The heartbeat can be heard with a stethoscope.
- The crown-rump length is 210 mm (about 8½ inches).
- The fetus weighs 630 grams (1 pound, 6 ounces).
- At this time, there is a chance the fetus may live if delivered.

23-24 Weeks after Conception
(25-26 weeks after the last menstrual period)

The lungs continue to grow. The lung cells begin to make a chemical called “surfactant.” Large amounts of surfactant are needed to keep the lungs open between breaths after birth. Fat gradually builds up under the skin.

- The fetus can suck on fingers or hands.
- The fetus begins to store fat under the skin.
- The fetus will blink and act startled in response to loud noises near the woman’s belly.
- The crown-rump length reaches 230 mm (about 9 inches).
- The fetus weighs 820 grams (a little less than 2 pounds).

Third Trimester

25-26 Weeks after Conception
(27-28 weeks after the last menstrual period)

The lungs continue to grow. The fetus continues to gain weight. The brain grows and starts to do more complex tasks.

- Fetal eyes will open slightly.
- Eyelashes are formed.
- The crown-rump length reaches 250 mm (about 10 inches).
- The fetus weighs 1000 grams (about 2 pounds and 3 ounces).

27-28 Weeks after Conception
(29-30 weeks after the last menstrual period)

The fetal brain can now control body temperature and direct regular breathing. The fetus can weakly grasp at things. Different growth rates from one fetus to another become clear. Some grow more quickly than others.

- The eyes open wide.
- Toenails begin to form.
- Blood cells are made in the bone marrow.
- The crown-rump length is around 270 mm (nearly 11 inches).
- The fetus weighs 1300 grams (almost 3 pounds).

29-30 Weeks after Conception
(31-32 weeks after the last menstrual period)

More fat builds up under the skin. The skin thickens. The fetus starts to look more like a newborn baby. The lanugo hairs on the face go away.

- The pupils of the eyes react to light.
- The fetus may now hiccup.
- The crown-rump length is around 280 mm (just over 11 inches).
- The fetus weighs around 1700 grams (about 3¾ pounds).

31-32 Weeks after Conception

(33-34 weeks after the last menstrual period)

Fat is still building up under the skin as the fetus grows. The lungs keep growing and making more surfactant. Surfactant helps the lungs to remain open if the fetus is delivered at this point.

- The ear holds it shape when moved.
- Fetal muscle tone increases.
- The crown-rump length is around 300 mm (just under 1 foot).
- The fetus weighs around 2100 grams (over 4½ pounds).

33-34 Weeks after Conception

(35-36 weeks after the last menstrual period)

The lungs and the nervous system keep growing. Also, more fat builds up under the skin. The fetus begins looking chubby. Hair on the head begins looking normal.

- Testes in male fetuses start to move from the abdomen into the scrotum.
- The labia (vaginal lips) in female fetuses begin to cover the clitoris.
- The fetus moves into a head-down position to prepare for delivery.
- The average crown-rump length is over a foot.
- The fetus weighs around 2500 grams (over 5 pounds).

35-36 Weeks after Conception

(37-38 weeks after the last menstrual period)

In almost all cases, fetal lungs are mature at this point. The fetus drops lower into the mother's pelvis. The mother may notice increased pressure on her bladder. Lanugo hairs are almost all gone except for around the shoulders and upper arms. The fetus may be born now or may stay in the womb while more fat builds up under the skin.

37-38 Weeks after Conception

(39-40 weeks after the last menstrual period)

This is full term in pregnancy. Most babies are born during this time. The average crown-rump length is 360 (over 14 inches). The total length counting the legs is about 20 inches. On average, a full-term baby weighs 3400 grams (or 7½ pounds).

IV. Risks of Pregnancy

All pregnancies have some risk of complications. These risks are affected by the pregnant woman's health and the prenatal care she receives.

The Centers for Disease Control and Prevention (CDC) counts pregnancy-related death as any death while pregnant or up to one year after the end of the pregnancy, from any cause associated with the pregnancy or its management. Each year, approximately 650 women die of pregnancy complications. According to the CDC, in 2011 there were 17.8 overall pregnancy related deaths in the United States per 100,000 women who became pregnant. Race was strongly linked with pregnancy-related deaths; black women were 3-4 times more likely to die from complications of pregnancy than were white women. Women of other races were nearly 1.5 times more likely to die of pregnancy-related causes than were white women.

One problem that may result in serious injury from pregnancy is pre-eclampsia. Symptoms of pre-eclampsia include high blood pressure, protein in the urine, and swelling. Pre-eclampsia occurs in 5 percent of all pregnancies. The risk is higher with the first baby. Pre-eclampsia may cause maternal stroke, bleeding disorders, kidney damage, heart disease and seizures.

Infection is another cause of problems in pregnancy and childbirth. Infection during pregnancy is usually only in the pelvic organs. If an infection during pregnancy enters the mother's bloodstream, intensive treatment could be required.

Premature labor occurs in about 12 percent of pregnancies. Treatment sometimes requires long hospital stays. Medicine used to stop premature labor can cause fluid in the lungs and heart failure in the mother. Premature infants may have serious health problems. The risk of complications for premature infants is lower as the pregnancy nears nine months. Premature labor may be associated with smoking, drug use, diabetes, or other health conditions. Sometimes, the cause of premature birth is not known.

Pregnant women can develop temporary diabetes (gestational diabetes). This increases the risks of difficult delivery and cesarean delivery. Infants whose mothers have gestational diabetes have a higher risk of medical complications and death. The risk of gestational diabetes is higher if you are overweight or have family members with diabetes.

About 32 percent of all women in the USA will need an operation to deliver the baby (Cesarean or C-section delivery). Chances of needing a C-section increase when there are problems with the placenta, when the fetus is distressed and the heart rate slows down, when there are multiple fetuses, when the fetus has a large head size, etc.

Hemorrhage (too much bleeding) can occur either before or during delivery. Bleeding during delivery is sometimes serious enough to require a blood transfusion and/or cause a woman to need a hysterectomy (removal of uterus).

Difficult deliveries can cause damage to the bladder and rectum. Surgery may be needed to fix this damage.

Anesthesia, which has some risks, may be needed for difficult deliveries, Cesarean sections, and emergencies.

Pregnancy is usually a safe, natural event, but problems can arise. Talking with a doctor may help you learn your risks.

V. Methods of Abortion

If a woman has made an informed decision and chosen to have an abortion, she and her doctor must first determine how far her pregnancy has progressed. The stage of a woman's pregnancy will directly affect the appropriateness or method of abortion. The doctor will use a different method for women at different stages of pregnancy. In order to determine the gestational age of the embryo or fetus, the doctor will perform a pelvic exam and/or an ultrasound.

Abortion Risks

At or prior to eight weeks after the first day of the last normal menstrual period is considered the safest time to have an abortion. The complication rate doubles with each two-week delay after that time. The risk of complications for the woman increases with advancing gestational age.

According to data from the Centers for Disease Control and Prevention (CDC), the risk of dying as a direct result of a legally induced abortion is less than one per 100,000. This risk increases with the length of pregnancy. For example:

- 1 death for every 530,000 abortions at 8 or fewer weeks
- 1 death per 17,000 at 16-20 weeks
- 1 death per 6,000 at 21 or more weeks

The risk of dying in childbirth is less than 1 in 10,000 births.

The risks or possible complications associated with an abortion are listed under each abortion procedure and are further described on pages 20 and 21 under Medical Risks of Abortions and Long-Term Medical Risks sections of this booklet.

METHODS USED PRIOR TO 14 WEEKS

Early Non-Surgical Abortion

- A drug is given that stops the hormones needed for the fetus to grow. In addition, it causes the placenta to separate from the uterus, ending the pregnancy.
- A second drug is given by mouth or placed in the vagina causing the uterus to contract and expel the fetus and placenta.
- A return visit to the doctor is required for follow up to make sure the abortion is completed.

Possible Complications

- Incomplete abortion
- Allergic reaction to the medications
- Painful cramping
- Nausea and/or vomiting
- Diarrhea
- Fever
- Infection
- Heavy bleeding

Vacuum Aspiration Abortion

- A local anesthetic is applied or injected into or near the cervix to prevent discomfort or pain.
- The opening of the cervix is gradually stretched with a series of dilators. The thickest dilator used is about the width of a fountain pen.
- A tube is inserted into the uterus and is attached to a suction system that will remove the fetus, placenta and membranes from the woman's uterus.
- A follow-up appointment should be made with the doctor.

Possible Complications

- Incomplete abortion
- Pelvic infection
- Heavy bleeding
- Torn cervix
- Perforated uterus
- Blood clots in uterus

Dilation and Curettage Abortion

- A local anesthetic is applied or injected into or near the cervix to prevent discomfort or pain.
- The opening of the cervix is gradually stretched with a series of dilators.
- The thickest dilator used is about the width of a fountain pen.
- A spoon-like instrument (curette) is used to gently scrape the walls of the uterus to remove the fetus, placenta, and membranes.
- A follow up appointment should be made with the doctor.

Possible Complications

- Incomplete abortion requiring vacuum aspiration
- Pelvic infection
- Heavy bleeding
- Torn cervix
- Perforated uterus
- Blood clots in uterus has the same risks.

METHODS USED AFTER 14 WEEKS

Dilatation and Evacuation (D&E)

- Sponge-like tapered pieces of absorbent material are placed into the cervix. This material becomes moist and slowly opens the cervix. It will remain in place for several hours or overnight. A second or third application of the material may be necessary.
- Following dilation of the cervix, intravenous medications may be given to ease discomfort or pain and prevent infection.
- After a local or general anesthesia has been administered, the fetus and placenta are removed from the uterus with medical instruments such as forceps and suction curettage. Occasionally for removal, it may be necessary to dismember the fetus.

Possible Complications

- Blood clots in the uterus
- Heavy bleeding
- Cut or torn cervix
- Perforation of the wall of the uterus
- Pelvic infection
- Incomplete abortion
- Anesthesia-related complications.

Labor Induction (Including Intra-Uterine Instillation)

- Labor induction may require a hospital stay.
- Medicine is placed in the cervix to soften and dilate it.
- There are three ways to start labor early:
    - Medication is given directly into the bloodstream (vein) of the pregnant woman, starting uterine contractions.
    - Medication inserted into the vagina to start uterine contractions.
    - Medication injected (instillation) directly into the amniotic sac by inserting a needle through the mother's abdomen and into the amniotic sac (bag of waters). This stops the pregnancy and starts uterine contractions.
- Labor and delivery of the fetus during this period are similar to the experiences of childbirth.
- The duration of labor depends on the size of the baby and the contractility of the uterus.
- There is a small chance that a baby could live for a short period of time depending on the baby's gestational age and health at the time of delivery.

Possible Complications

- If the placenta is not completely removed during labor induction, the doctor must open the cervix and use suction curettage (removal of uterine contents by low-pressure suction).
- Labor induction abortion carries the highest risk for problems, such as infection and heavy bleeding.
- When medicines are used to start labor, there is a risk of rupture of the uterus.
- As with childbirth, possible complications of labor induction include infection, heavy bleeding, stroke and high blood pressure.
- Other medical risks may include blood clots in the uterus, cut or torn cervix, perforation of the wall of the uterus, pelvic infection, incomplete abortion, anesthesia-related complications.

Hysterotomy (similar to a Caesarean Section)

- This method requires that the woman be admitted into a hospital.
- A hysterotomy may be performed if labor cannot be started by induction, or if the woman or her fetus is too sick to undergo labor.
- A hysterotomy is the removal of the fetus by surgically cutting open the abdomen and uterus.
- Anesthetic medication, given into the woman's vein or back, or inhaled into the lungs, is administered so the woman will not feel the surgery.

Possible Complications

- Complications are similar to those seen with other abdominal surgeries and administration of anesthesia
- Severe infection (sepsis)
- Blood clots to the heart and brain (emboli)
- Stomach contents breathed into the lungs (aspiration pneumonia)
- Severe bleeding (hemorrhage)
- Injury to the urinary tract
- Blood clots in the uterus
- Heavy bleeding
- Pelvic infection
- Retention of pieces of the placenta
- Anesthesia related complications

Dilation and Extraction

- This method may be performed between 20 and 32 weeks gestation.
- Sponge-like tapered pieces of absorbent material are placed into the cervix. This material becomes moist and slowly opens in the cervix. It will remain in place for one to two days. A second or third application of the material may be necessary.
- After a local or general anesthesia has been administered, the fetus and placenta are removed from the uterus with medical instruments such as forceps, suction and curette (a spoon-like instrument). It may be necessary to dismember the fetus.

Possible Complications

- Risks are similar to childbirth
- Uterine infection
- Heavy bleeding
- High blood pressure
- Rare events such as blood clot, stroke or anesthesia-related death

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VI. Risks of Abortion Procedures

Serious problems with legal abortions are rare. The risk of a woman dying from a legal abortion is slight. The abortion method used, the length of the pregnancy, and the age of the woman affect this risk. The risk of death from childbirth is 14 times greater than the risk of death from legal abortion.

In 2013, the Centers for Disease Control and Prevention (CDC) identified four abortion-related deaths. The annual number of deaths related to legal induced abortion has fluctuated from year to year over the past 40 years. For example, nine legal induced abortion-related deaths occurred in 1998, four in 1999, and 11 in 2000. The national legal induced abortion case-fatality rate for 2008–2013 was 0.62 legal induced abortion-related deaths per 100,000 reported legal abortions.

Some women may experience temporary feelings of sadness or stress when making the decision to terminate a pregnancy. However, women who have chosen to have an abortion experience about the same mental and emotional health as women who have not had an abortion and women who carry an unplanned pregnancy to delivery. Pre-existing mental health and life circumstances are more influential on mental health after abortion than the abortion itself.

When Performed During the First Three Months

Abortions performed during the first three months of pregnancy are safer and easier than those performed after the first three months. There may be some minor discomfort, either during a surgical abortion or medication abortion, much like menstrual cramps.

When Performed During the Second Three Months

Abortions performed during the second three months of pregnancy are more complicated than those during the first trimester. While they are still safe, there is a greater chance of problems following a second trimester abortion than there is with a first trimester abortion. Most women experience some discomfort during the procedure and have some cramping afterwards.

After a First or Second Trimester Procedure

On rare occasions a woman may experience some problems following an abortion. These may include:

- An incomplete abortion, which may require the woman to have a surgical abortion
- An infection in the female reproductive organs
- Heavy bleeding, or
- Damage to the uterus or cervix

It is important to contact your healthcare provider if you:

- Start to run a fever
- Experience severe pain or tenderness in your pelvic area, lower abdomen, and/or lower back
- Experience very heavy vaginal bleeding, or
- Notice a very bad odor from your vagina

Your healthcare provider will explain:

- The risks of the type of abortion you choose
- Possible problems you may experience during and after the abortion
- When you should call or come back to the clinic if you experience problems after the abortion.

Third Trimester (Late) Abortions

In the last three months of pregnancy, an abortion is done only to save the life or health of the woman. According to South Carolina law, in the last three months of pregnancy, an abortion is done only with the pregnant woman's consent.

If she is married, her husband must also consent.

It must be done only in a certified hospital.

Also, the woman's physician and a second physician must state in writing that the abortion is needed based on their best medical judgment to save the life or health of the woman. The second physician cannot be related to or work in private practice with the woman's physician.

In the case of an abortion to preserve the woman's mental health, this reason must also be stated in writing by a psychiatrist. The psychiatrist cannot be related to or work in private practice with the woman's physician.

Late abortions performed in South Carolina are rare.

2010 Bibliography

Adler, N. E. (2000). Abortion and the null hypothesis. Archives of General Psychiatry, 57, 785-786.

Adler, N. E., David, H. P., Mojor, B. N., Roth, S. H., Russo, N. F., & Wyatt, G. E. (1990, April 6). Psychological responses after abortion. Science, 248(4951), 41-44. doi:DOI: 10.1126/science.2181664

Centers for Disease Control and Prevention. (2003, February 21). Pregnancy-related mortality surveillance -- United States, 1991-1999. Morbidity and Mortality Weekly Report, 52(SS-2), pp. 1-12. Retrieved from http://www.cdc.gov/mmwr/PDF/ss/ss5202.pdf

Centers for Disease Control and Prevention. (2009). Maternal and infant health research: Pregnancy complications.

Centers for Disease Control and Prevention. (2009). Prematurity. Retrieved from Reproductive health: Maternal and infant health.

Cunningham, F. G., Leveno, K. J., Bloom, S. L., Hauth, J. C., Rouse, D. J., & Spong, C. Y. (2001). Williams Obstetrics (21st ed.). Norwalk, Connecticut: Appleton & Lange.

Guttmacher, A. F. (2003). Dr. Guttmacher's Pregnancy, Birth & Family Planning (2nd ed.). (R. Lichtman, L. L. Simpson, & L. M. Cooper, Eds.) New York: New American Library.

Hatcher, R. A., Trussell, J., & Nelson, A. L. (2007). Contraceptive Technology (19th ed.). New York: Ardent Media.

Henshaw, R., Naji, S., Russell, I., & Templeton, A. A. (1994). Psychological responses following medical abortion (using mife-pristone and gemeprost) and surgical vacuum aspiration: A patient-centered, partially randomized prospective study. Acta Obstetrica et Gynecologica Scandinavica, 73(10), 812-818.

Kero, A., Hoberg, U., & Lalos, A. (2004, June). Wellbeing and mental growth - long term effects of legal abortion. Social Science and Medicine, 58(12), 2559-2569.

Larsen, W. J. (2001). Human Embryology (21st ed.). New York: Churchill-Livingston Co., Inc.

Longe, J. L. (2006). The Gale Encyclopedia of Medicine (3rd ed., Vol. 4). Detroit: Cengage Gale.

Major, B., Cozzarelli, C. M., & Cooper, L. M. (2000, August). Psychological responses of women after first-trimester abortion. Archives of General Psychiatry, 57(8), 777-784.

Menacker, F., & Hamilton, B. E. (2010, March). NCHS Data Brief No. 35: Recent trends in cesarean delivery in the United States. Retrieved from Centers for Disease Control and Prevention: http://www.cdc.gov/nchs/data/databriefs/db35.pdf

Moore, K. L., & Persaud, T. (2001). The Developing Human: Clinically Oriented Embryology (7th ed.). Philadelphia: W.B.Saunders Co.

South Carolina Code of Laws Title 44: Health, Chapter 41: Abortions. (2009). Retrieved from http://www.scstatehouse.gov/code/t44c041.php

Telinde, R. W. (1997). Operative Gynecology (8th ed.). (B. L. Company, Ed.) Philadelphia: J. .

Urguhart, D. R., & Templeton, A. A. (1991, April). Psychiatric morbdidity and acceptability following medical and surgical methods of abortion. British Journal of Obstetrics and Gynaecology, 98(4), 396-399.

2018 Bibliography (updates to 2010)

American Congress of Obstetricians and Gynecologists. (2015, June). Prenatal development: How your baby grows during pregnancy. Retrieved June 26, 2015, from ACOG: Women's Health Care Physicians: http://www.acog.org/Patients/FAQs/Prenatal-Development-How-Your-Baby-Grows-During-Pregnancy#measured

American Psychological Association Task Force on Mental Health and Abortion. (2008). Report of the APA Task Force on Mental Health and Abortion. Retrieved from http://www.apa.org/pi/wpo/mental-health-abortion-report.pdf

Bartlett, L. A., Shulman, H. B., Zane, S. B., Green, C. A., Whitehead, S., & Atrash, H. K. (2004, April). Risk factors for legal induced abortion-related mortality in the United States. Obstetrics and Gynecology, 103(4), 729-736.

Centers for Disease Control and Prevention. (2010, January 15). QuickStats: Pregnancy, birth, abortion, and fetal loss rates per 1,000 women aged 15--19 Years, by race and hispanic ethnicity --- United States, 2005. Morbidity and Mortality Weekly Report, 59(1), p. 12. Retrieved from http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5901a6.htm

Centers for Disease Control and Prevention. (2014, January 22). Pregnancy Complications. Retrieved June 25, 2015, from Reproductive Health: http://www.cdc.gov/reproductivehealth/maternalinfanthealth/pregcomplications.htm

Centers for Disease Control and Prevention. (2014, December 23). Pregnancy-related mortality surveillance system. Retrieved June 25, 2015, from http://www.cdc.gov/reproductivehealth/maternalinfanthealth/pmss.html

Centers for Disease Control and Prevention. (2014, December 23). Preterm birth. Retrieved June 25, 2015, from http://www.cdc.gov/reproductivehealth/MaternalInfantHealth/PretermBirth.htm

Centers for Disease Control and Prevention. (2014, December 23). Reproductive Health: Pregnancy Mortality Surveillance System. Retrieved June 26, 2015, from http://www.cdc.gov/reproductivehealth/MaternalInfantHealth/PMSS.html

Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report, Mortality Abortion Surveillance — United States, 2014, Surveillance Summaries / November 24, 2017 / 66(24);1–48,

Charles, V. E., Polis, C. B., Sridhara, S. K., & Blum, R. W. (2008, December). Abortion and long-term mental health outcomes: A systematic review of the evidence. Contraception, 78(6), 436-450. doi:10.1016/j.contraception.2008.07.005

Cunningham, F. G., Leveno, K. J., Bloom, S. L., Hauth, J. C., Rouse, D. J., & Spong, C. Y. (2001). Williams Obstetrics (21st ed.). Norwalk, Connecticut: Appleton & Lange.

Hatcher, R. A., Trussell, J., Nelson, A. L., Cates, W., Kowal, D., & Policar, M. S. (2011). Contraceptive Technology (20th ed.). New York: Ardent Media.

Hockenberry, M. J., & Wilson, D. (2013). Wong's Essentials of Pediatric Nursing (9th ed.). St. Louis, MO: Elsevier Mosby.
Larsen, W. J. (2001). Human Embryology (21st ed.). New York: Churchill-Livingston Co., Inc.

Major, B., Appelbaum, M., Beckman, L., Dutton, M. A., Russo, N. F., & West, C. (2009). Abortion and mental health: Evaluating the evidence. American Psychologist, 64(9), 863-890. doi:10.1037/a0017497

Menacker, F., & Hamilton, B. E. (2010, March). NCHS Data Brief No. 35: Recent trends in cesarean delivery in the United States. Retrieved from Centers for Disease Control and Prevention: http://www.cdc.gov/nchs/data/databriefs/db35.pdf

Moore, K. L., & Persaud, T. (2001). The Developing Human: Clinically Oriented Embryology (7th ed.). Philadelphia: W.B.Saunders Co.

Moore, K. L., & Persuade, T. (2001). The Developing Human: Clinically Oriented Embryology (7th ed.). Philadelphia: W. B. Saunders Co.

Pazol, K., Creanga, A. A., Burley, K. D., & Jamieson, D. J. (2014, November 28). Abortion surveillance -- United States, 2011. Morbidity and Mortality Weekly Report, 63(SS 11). Retrieved from http://www.cdc.gov/mmwr/pdf/ss/ss6311.pdf

Raymond, E. G., & Grimes, D. A. (2012). The comparative safety of legal induced abortion and childbirth in the United States. Obstetrics and Gynecology, 119(2 pt 1), 215-219. doi:10.1097/AOG.0b013e31823fe923 South Carolina Code of Laws

Title 44: Health, Chapter 41: Abortions. (2009). Retrieved from http://www.scstatehouse.gov/code/t44c041.php

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Telinde, R. W. (1997). Operative Gynecology (8th ed.). (B. L. Company, Ed.) Philadelphia: J. .

Urguhart, D. R., & Templeton, A. A. (1991, April). Psychiatric morbdidity and acceptability following medical and surgical methods of abortion. British Journal of Obstetrics and Gynaecology, 98(4), 396-399.

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