

OB/GYN Emergencies



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Obstetrical Emergencies

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INTRODUCTION

Dealing with obstetrical emergencies can be very stressful for the EMT. Since these emergencies are, fortunately, quite rare, most EMTs cannot rely on experience to guide their care. A breech birth, shoulder dystocia, and eclampsia are calls that may happen once in a career, if that. The best way to prepare for such emergencies is to be familiar with the anatomy and physiology of the female reproductive system, the progression of a normal pregnancy, and how to assist with a normal delivery. It is also critical to understand the actions that must be taken if there are complications. In addition, it is important to stay up to date on changes in issues around pregnancy, such as the Safe Haven laws that protect newborns, and dealing with midwives and doulas in the field setting.

ANATOMY

Female Reproductive System

The female reproductive system includes the ovaries, fallopian tube, uterus, and vagina. The ovaries are found on either side of the uterus; they serve both as an endocrine gland producing hormones such as estrogen, and also as an organ producing eggs.

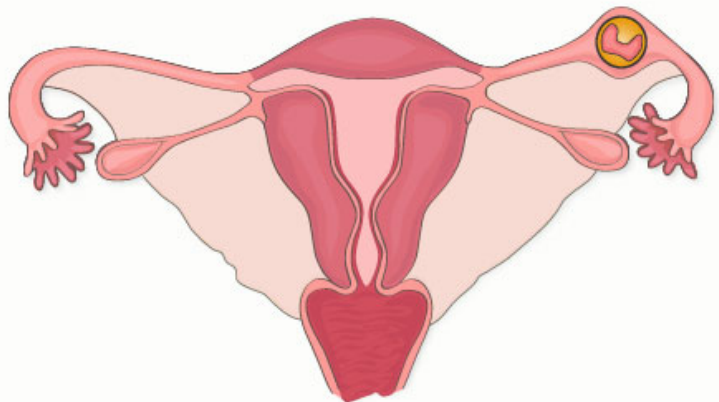
The fallopian tubes stretch between the ovaries and the uterus. When an egg is released from an ovary, approximately monthly during the childbearing years, it is pulled into the fallopian tube. Fertilization from a sperm usually occurs within the fallopian tube; the fertilized egg then makes its way to the uterus.

The uterus is a powerful, muscular organ that serves as the home for the developing fetus for 9 months, as well as providing the power that pushes that fetus out into the world at the end of development.

The vagina extends from the uterus to the external genitalia and is the passageway that the baby travels during childbirth.

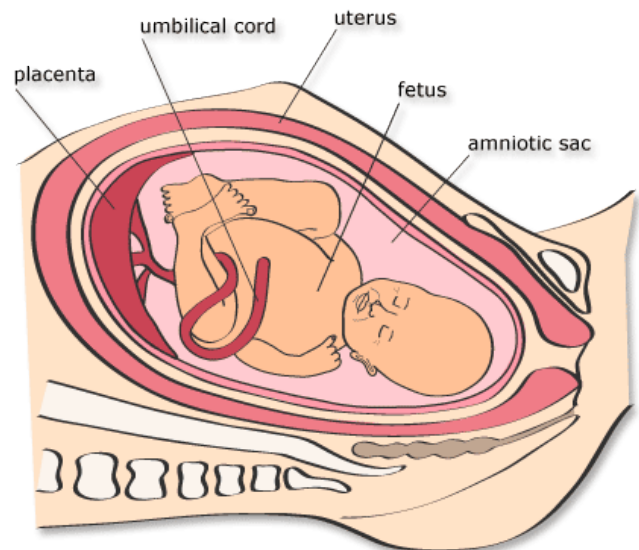
Pregnancy and Fetal Development

Once fertilized, the egg begins to divide. The fertilized egg continues down the fallopian tube to the uterus where it attaches to the endometrium. A fertilized egg develops remarkably fast. Some of the significant development changes are highlighted below.



Weeks (Prenatal Visits)	Length (inches)	Weight (ounces)
8 weeks	0.63	0.04 ounces
12 weeks	2.13	0.49 ounces
16 weeks	4.57	3.53 ounces
20 weeks	6.46	10.58 ounces
24 weeks	11.81	1.32 pounds
28 weeks	14.80	2.22 pounds
30 weeks	15.71	2.91 pounds
32 weeks	16.69	3.75 pounds
34 weeks	17.72	4.73 pounds
36 weeks	18.66	5.78 pounds
37 weeks	19.13	6.30 pounds
38 weeks	19.61	6.80 pounds
39 weeks	19.96	7.25 pounds
40 weeks	20.16	7.63 pounds

In addition to the changes in the fetus, other changes are happening in the body of the mother. The placenta begins to develop in the third week. This organ connects the mother and the fetus. Through the placenta, the fetus receives nutrients and oxygen, and returns waste products to the mother for elimination; the umbilical cord serves as the connection from the fetus to the placenta. The placenta is very vascular; trauma or damage to the organ can result in life-threatening bleeding.



PHYSIOLOGY

Menstrual Cycle

The menstrual cycle is a woman's monthly hormonal cycle in which the uterus prepares to receive an egg and then discharges a bloody fluid. The cycle repeats on an average every 28 days, but can vary widely.

Days 1 to 5

If an egg has not been fertilized, hormone levels become lower causing the thickened lining of the uterus to shed. This results in a woman's period. The first day of menstrual bleeding is Day 1 in the menstrual cycle.

Days 6 to 14

During this phase, the pituitary gland produces a hormone that stimulates the ovaries to develop follicles each containing an egg. Only one egg will reach maturity and have the potential to become fertilized. Hormone levels increase causing the lining of the uterus to thicken and prepare to receive the mature egg.

Days 10 to 18

The hypothalamus and pituitary glands release a hormone that causes the mature follicle to burst and release the egg. This is called ovulation. Ovulation typically occurs midway through the menstrual cycle on Day 14.

Next, the egg begins its journey down the fallopian tubes to the uterus. This is the time period when a woman is most likely to become pregnant.

Days 16 to 28

After releasing the egg, the ruptured follicle takes on a new role and secretes progesterone which continues to thicken the lining of the uterus in preparation for the fertilized egg. If the egg is fertilized by sperm, it implants in the lining of the uterus. If the egg is not fertilized or does not implant, the lining of the uterus is shed again at the beginning of the next menstrual cycle.

Changes During Pregnancy

There are a great many physiologic changes that occur in the mother during the 9 months of pregnancy, as her body changes to support the growing fetus.

Endocrine changes include the release of hormones associated with pregnancy. These have a variety of effects, from increasing the respiratory rate and relaxing the bronchioles, to conserving blood glucose that can be used by the fetus. Some of these hormonal changes can have side effects, such as decreasing sensitivity to insulin, sometimes causing gestational diabetes.

The cardiovascular effects of pregnancy are dramatic. Over the course of 9 months, the maternal blood volume increases by up to 50%. At the same time, peripheral vascular

resistance decreases, so the overall effect is of a relatively low blood pressure. By the third trimester, a normal blood pressure is 110/70; in fact a reproducible blood pressure of 140/90 in the third trimester is considered pre-eclamptic and necessitates treatment. To go along with the increased blood volume is an increase in stroke volume and heart rate.

A pregnant woman becomes hypercoagulable – in other words, her blood clots more easily. In likelihood, this evolved in order to help stop bleeding during pregnancy or after delivery of the baby. However it also puts the woman at risk of pulmonary embolus. Lack of mobility during pregnancy can increase the risk. Be alert to the possibility of embolus in a pregnant woman who complains of a sudden onset of shortness of breath.

The gastrointestinal tract also changes with pregnancy. Early in pregnancy, women may complain of “morning sickness” (nausea and vomiting). It is thought that this results from the body’s increased sensitivity to possible toxins at a time when the fetus is most susceptible to developmental abnormalities.

The body’s musculoskeletal system must also adapt to the changes in pregnancy, including increased weight and a redistribution of that weight. As the woman changes her posture to adapt, she is at increased risk of falling. Also, some of the hormones of pregnancy help soften soft tissues and cartilage around certain joints, such as those of the pelvis, to ease delivery; however these changes may increase instability in walking.

After delivery, it may take days, weeks, or longer for the woman’s physiology to return to the non-pregnant state.

PATIENT ASSESSMENT

Special Terminology

abruptio placenta — This condition occurs when the placenta prematurely separates from the uterine wall causing heavy internal bleeding and pain; it can occur as a result of trauma.

bloody show — Mucous and blood that comes from the vagina as the first stage of labor begins. The cervix is sealed by a plug of mucus during pregnancy to prevent contamination. When the cervix dilates, the plug is expelled as pink-tinged mucous.

Braxton-Hicks — Contractions that begin before labor; commonly occur in the second and third trimester.

cervix — The opening to the uterus. During the first stage of birth, the cervix opens and thins to allow the fetus to move into the vagina. This opening process is called dilation.

crowning — The bulging out of the vaginal opening caused by the baby’s head pressing against it.

dilation — To get larger or enlarge. The degree of dilation of the cervix is often a key indicator used by midwives and physicians to determine if birth is imminent. However, EMTs

do not perform this test. The process occurs over a period of several hours in some women, but can take much longer.

eclampsia (toxemia) — A serious condition that can develop in the third trimester. Pre-eclampsia is characterized by high blood pressure, high protein in the urine, and excessive swelling in the extremities and face. Life-threatening seizures differentiate eclampsia from preeclampsia.

ectopic pregnancy — Condition where a fertilized egg implants outside the uterus, often in the fallopian tubes. Symptoms can include abdominal pain and vaginal bleeding.

effacement — A term relating to the thinning of the cervix.

endometrium — The inner lining of the uterus.

meconium — A dark-green fecal material found in the intestines of full-term babies. Ordinarily, the meconium is passed after a baby is born. In some cases, the meconium is expelled into the amniotic fluid prior to birth. It gives the fluid a greenish-brown color known as *meconium staining*.

placenta previa — A condition where the placenta sits low in the uterus blocking the cervix. It can present with painless, bright red bleeding.

postpartum — A term used to describe the period shortly after childbirth.

preeclampsia — A condition found in pregnant women characterized by high blood pressure, abnormal weight gain, edema, headache, protein in the urine, and epigastric pain. If untreated, preeclampsia can progress to eclampsia.

supine hypotensive syndrome — A pregnancy-related condition where the weight of an unborn fetus and the uterus puts pressure on the inferior vena cava. The result is inadequate venous blood return to the heart, reduced cardiac output, and lowered blood pressure.

Prenatal Care

Prenatal care, the health care that women get when they are pregnant, has a significant positive impact on fetal and maternal health. Early care is particularly important, since critical fetal development takes place early in pregnancy.

The number of prenatal visits is dependent on several factors, including the age of the woman and her medical history; once every 4 weeks is a timeframe used by many providers. If problems with the pregnancy are discovered, the prenatal care will be adjusted accordingly. Towards the end of pregnancy, visits are recommended more frequently.

The first prenatal visit is often exhaustive, including a detailed medical, vaccination, and family history, bloodwork, and education about smoking cessation or other lifestyle changes. At this time, women are educated to take prenatal vitamins and folic acid, which can reduce the risk of some types of birth defects.

During the second trimester, the provider will often evaluate the baby's size, heartbeat, and movement; women at this time may be offered an ultrasound and screening for genetic anomalies.

In the third trimester, visits may increase to once every 3 weeks, 2 weeks, and then once a week. Blood pressure and urine tests may be done. There will also be screening for group B strep, a bacterial infection that is generally harmless in women but that can cause sepsis in their babies. Lastly, the position of the baby in the uterus will be determined by ultrasound; based on this and other factors, the decision will be made about a vaginal delivery vs. cesarean section.

When faced with an imminent childbirth, it is important to ask about prenatal care. A woman who has had no prenatal care, particularly if she is engaged in high risk behavior such as drug use, may have a difficult delivery or may deliver an infant who is premature or in distress.

Stages of Labor

The first stage of labor begins when the cervix starts to dilate, and ends when it is fully dilated. During this time, contractions begin and increase in intensity. This stage of labor is the longest, lasting up to 20 hours particularly if this is the woman's first pregnancy.

The second stage of labor begins when the cervix is fully dilated, includes the passage of the baby through the birth canal, and ends when the baby is born. During this time, contractions are at their strongest. The second stage of labor can last up to 2 hours and is usually much shorter in women with previous pregnancies.

The third stage of labor begins after the birth of the baby and ends with the delivery of the placenta. This is the shortest stage of labor, usually not lasting more than 15 or 20 minutes, sometimes less. During this stage, contractions will begin again until the placenta is expelled.

OB Kit



TREATMENT

Signs of Imminent Delivery

The first task in evaluating an expectant mother is to determine if delivery is imminent. If the infant is likely to be born within a few minutes, transport should generally not be started unless you believe that there are complications that may make the delivery difficult or impossible.

Prepare the woman by exposing the abdomen and genital area, taking care to be discrete. Visually inspect the vaginal area for bleeding or crowning.

Prepare for immediate delivery if you observe the following:

- Crowning
- Contractions less than 2 minutes apart
- Rectal fullness
- Feeling of imminent delivery

Crowning is the appearance of any part of the fetus in the mother's vagina. Remove enough of the mother's clothing to view the genital region. Look for bulging at the vaginal opening or a presenting part of the infant.

The woman may also complain of a sensation of needing move her bowels; this may indicate that the baby's head is in the vagina pushing against the rectum. Do not let the woman sit on the toilet, as birth may be imminent!

Timing of contraction intervals is important in determining the timing of delivery. During the first stage of labor, the mother will experience labor pains from contractions of the uterus. These help push the fetus from the uterus and dilate the cervix. They occur at regular intervals ranging from 30 minutes to 2 minutes or less. Labor pain from contractions lasts from 30 seconds to 1 minute.

As birth approaches, the interval between contractions gets shorter. Contractions that occur within 2 minutes of each other, from the beginning of one to the beginning of the next, signify impending delivery. However keep in mind that labor is generally prolonged for the mother's first baby (12 to 17 hours), and there may be ample time to transport. If the mother has previously given birth, her assessment is often more accurate than the timing of the contractions. If she tells you that the baby is coming, get ready!

Preparing for Delivery

Once you have determined that a field delivery is imminent, you should prepare as follows:

- Request a paramedic unit
- Don sterile gloves, gown, and eye protection
- Position mother on her back, legs drawn up
- Provide supplemental oxygen
- Prepare the OB kit
- Prepare an infant BVM

Assisting With a Normal Delivery

It is important to remember that the mother delivers the baby – as EMTs, we merely assist. Additionally, if the father, partner, or other family member is present, involve them in the process as appropriate. If no one else is taking on the role, you can act as a coach, encouraging the woman to bear down with contractions, and relax and breathe deeply in between.

As the baby crowns, note whether the amniotic sac is intact. Usually the amniotic sac breaks during the first stage of labor, expelling amniotic fluid, often referred to as "water breaking". If it is still intact, use a finger to pierce the sac. You will find it very tough. Let the fluid run out and pull the membranes away from the infant's mouth and nose.

Note the color and character of the amniotic fluid. The fluid is normally clear or straw-colored but can be tainted and discolored, or thick and "pea soup-like", which indicates meconium staining and may indicate a stressed baby.

Support the head with gentle pressure to avoid an explosive delivery. Once the face appears, suction the mouth and nose with a bulb syringe from the kit. Do this by squeezing air from the syringe then inserting into the nose and mouth and letting go of the bulb to create suction.

Check for a nuchal cord – the umbilical cord wrapped around the neck. Try to gently slip the cord over the baby's head by placing two fingers under the cord at the back of the neck. Bring the cord over the shoulders and head. Although the cord is durable, it can tear if handled roughly so do not use excessive force. If it is too tight to loosen, clamp the cord in two places two inches apart, and very carefully cut the cord between the clamps, then unwrap.

Once the head is delivered, encourage the woman to push strongly with contractions. To assist delivery of the anterior shoulder, apply gentle downward pressure on the shoulder and head. Once the anterior shoulder has delivered, apply gentle upward pressure to deliver the other shoulder.

When the head and shoulders deliver, be ready! The rest of the baby usually follows quickly. Babies are slippery so be very careful; dry and wrap the baby as quickly as possible. Stimulate the newborn by rubbing vigorously and tapping the feet.

Once pulsations have stopped, place a clamp approximately 6 inches from the baby. Place a second clamp approximately 2 inches from the first, then cut the cord between the clamps.

Re-suction the baby's mouth and nostrils **only if** baby is not breathing or is in respiratory distress. Dry and wrap the baby in a warm blanket — cover the head with a cap if possible. Place the baby at the mother's breast if possible, on his or her side to facilitate drainage.

Perform an APGAR assessment at 1 minute and 5 minutes after delivery.

Care of the Mother

After childbirth, you will be caring for two patients. A common mistake is to focus attention on the baby to the detriment of the mother. Therefore, once the baby is delivered and the umbilical cord is cut and clamped you should:

- Monitor and **control bleeding** from the mother
- Begin fundal massage
- Monitor **vital signs**
- Keep the mother and baby warm

In general, you should transport once the infant is delivered. Do not wait for the placenta— it may take up to 30 minutes to deliver. Do not pull on the umbilical cord. If the placenta does deliver at the scene, transport it with the mother and baby to the hospital.

After the placenta is delivered, place a sanitary napkin between the mother's legs. Ask her to hold her legs together. It is normal for the mother to bleed up to one cup (about 250 cc) or 5 sanitary napkins of blood after delivery. Record the number of pads.

Another strategy to help reduce bleeding is to allow the mother to nurse the infant. This will stimulate the release of hormones causing the uterus to contract. Be aware that a first-time mother may not know how to breastfeed.

Fundal massage makes the uterus contract and diminishes vaginal bleeding. You can feel for the fundus of the uterus, located in the abdomen between the pubic bone and umbilicus. It should feel like a softball. Perform the massage like you would a firm muscle massage. This area may be tender and massaging it can cause discomfort. Fundal massage is particularly important if there is post-partum hemorrhage; in any case, it should never cause a delay in transport.

Care of the Baby - APGAR

The APGAR scale is a numerical measure of a baby's overall condition immediately after birth. A perfectly healthy baby will have a total score of 10, while many babies score 7 to 8 during the first minute. By 5 minutes, most babies score 8 to 10 on the scale.

APGAR stands for:

- Appearance
- Pulse
- Grimace
- Activity
- Respirations

Apgar Scale			
Sign	0	1	2
Appearance (color of skin, nailbeds, or lips)	Blue, pale	Body pink, limbs blue	Completely pink
Pulse	Absent	<100	>100
Grimace	No response	Grimaces	Cries
Activity	Limp	Some flexion	Active motion
Respirations	Absent	Slow irregular crying	Strong crying

Assign a number (0, 1, or 2) for each category and then add the numbers for a total score. Repeat the process at 5 minutes. Use the lips and tongue for appearance of dark-skinned babies.

An APGAR score of 7 to 10 means adequate function. A score of 4 to 6 means moderate depression. An APGAR score of less than 4 requires that you begin resuscitation.

Although the APGAR score is important, it becomes a low priority in situations where both patients require all of your attention, for example, postpartum hemorrhaging or resuscitation.

Neonatal Resuscitation

There are three things to remember when managing an infant with a low APGAR score: position, suction, and stimulate (PSS).

- **Position** the body so that the head is down and the airway is open.
- **Suction** mucous and fluid from the mouth and nostrils.
- **Stimulate** the infant by taping the bottoms of the feet.

After delivery, if the infant is not breathing effectively after 10 to 15 seconds of stimulation, begin assisted respirations. Use an infant BVM with high-flow oxygen at a rate of 40 to 60 breaths/min.

If the pulse rate falls below 60 beats/min, start compressions and ventilations at ratio of 3:1. In King County, the ratio is 15:2. Be sure to follow your agency guidelines. Remember that ventilations is the most important action in neonatal resuscitation.

CPR - Two-Thumb Encircling Hands Technique

The CPR technique for an infant with a pulse rate below 60 beats/min is as follows:

1. Place the infant on a firm, flat surface.
2. Find the compression site, which is just below the nipple line on the middle or lower third of the sternum.
3. Wrap your hands around the upper abdomen with your thumbs on the compression site.
4. Use your thumbs to deliver gentle pressure against the sternum, pressing $\frac{1}{2}$ to $\frac{3}{4}$ inch into the chest.

Coordinate compressions and ventilations to avoid simultaneous delivery. Let the chest fully recoil during relaxation, but keep your thumbs on the chest.

SPECIAL CONSIDERATIONS

Safe Haven Law

Safe Haven laws decriminalize the turning over of an unharmed infant to a designated location such as a hospital, fire station, or police station. All 50 states have some version of this law, which was developed to prevent the abandonment and subsequent death of newborns and infants in dumpsters or other locations.

While the laws in each state vary, most incorporate these parameters:

- limited to newborns or infants
- must be turned over to a person rather than left outside a facility
- while anonymous, provision of information on family history is encouraged

In Washington State, an infant may be turned over to personnel at a hospital emergency room or a fire station, up to the age of 3 days. While anonymity of the person handing over the infant is preserved, the person accepting the infant may ask about family medical history and should also be prepared to provide information about adoption, counseling, and other social services. The person accepting the newborn must notify child protective services; they will assume custody of the infant within 24 hours. Washington State's RCW provides immunity from liability to firefighters or other qualified personnel who accept newborns under this provision.

For more information on Washington state's safe haven law, see:

http://safehaven.tv/states/washington/Washington_Safe_Haven_Law.pdf

For more information on safe haven laws in general, see the National Safe Haven Alliance's website:

<http://www.nationalsafehavenalliance.org/>

Midwives and Doulas

Both midwives and doulas help women make the transition from being pregnant to being a mother.

Doulas provide mostly supportive care rather than medical care. A birth doula assists with breathing techniques, relaxation, and massage; a post-partum doula assists with the care of the baby including breastfeeding and can help with the baby's siblings. There is a certification process for doulas.

A midwife is a medical professional who can perform many birthing tasks, including providing prenatal care, performing gynecological exams, administering pain medications and labor inducing drugs, and performing episiotomies. The focus is on promoting natural birth as well as recognizing possible complications. A common misconception is that a midwife-attended birth must occur in the home. Rather, a credentialed midwife can work in any setting, including a clinic and hospital, as well as in the mother's home. Like doulas, midwives go through a certification process; this varies from state to state.

Midwives and EMS personnel have the same goal – a healthy mother and healthy baby. Rarely, conflict can arise if there is an unexpected problem and 911 is called. Unlike most situations when we enter a scene and take charge immediately, in this situation, a more collaborative approach is needed. Recognize that the midwife is a skilled provider and the best approach is to listen to the midwife's history and reason for the call: is immediate transport needed? Is there a newborn who needs resuscitation? The best outcome for the mother and infant is to work cooperatively.