INTRODUCTION

Obstetric and gynecologic (OB/GYN) emergencies in the prehospital setting represent a wide disease spectrum, with tremendous variability in illness acuity. Fortunately, OB/GYN responses for EMS are infrequently life threatening and require little more than a focused history and physical examination along with safe and timely transport to the hospital. There are notable exceptions (e.g., imminent deliveries, prolapsed umbilical cords, and eclamptic seizures) that have the potential to be catastrophic. These calls challenge even the most seasoned medic and provoke significant anxiety for patients and their families, EMS dispatchers and providers, and even EMS medical directors. These are stressful, time-sensitive emergencies for which most EMS providers have had limited exposure and medical education. Like all prehospital encounters, these calls are made even more challenging by limited equipment and manpower resources and unpredictable environments. Deliveries encountered in the prehospital setting are frequently from known high-risk pregnancies and are often significantly premature. These factors lend to the increased maternal and infant morbidity and mortality found in the prehospital setting.\(^1\)

The role of the EMS medical director is to ensure that crews are properly trained and equipped. This includes seeing that their educational staff has adequate high-quality offerings for the field crews on this broad range of topics and aggressively reviewing patient care reports to ensure that appropriate, compassionate, and evidence-based care is being consistently delivered.

EVALUATION OF THE PATIENT WITH A GYNECOLOGIC COMPLAINT

General Approach

Most EMS providers are not afforded the luxury of bedside urine pregnancy testing. Accordingly, to maximize patient safety, all female patients of childbearing age are considered to be potentially pregnant until proven otherwise. Patients at extremes of age can reasonably be treated in a more directed fashion. EMS providers infrequently encounter children and pre-teens with gynecologic complaints, and any gynecologic complaint in this age group should at least raise the suspicion of sexual abuse. Medical directors must ensure prehospital providers understand their states’ reporting laws and procedures for suspected abuse. Postmenopausal women with infectious or hemorrhagic complaints should be treated with appropriate goal-directed resuscitative therapy as indicated.

Women of childbearing age with pelvic and/or lower quadrant abdominal pain should have a focused assessment performed that includes vital signs, cardiopulmonary examination, and a standard abdominal examination. Providers should be taught to maintain a broad differential that includes gynecologic, obstetric, and intestinal causes of pain. Pain control should be administered according to protocol or after contacting direct medical oversight (DMO). Women with infectious complaints (i.e., fever, discharge, and pain) should be assessed for signs of sepsis with a similar
focused assessment and examination. In most non-delivery cases, visual inspection or palpation beneath the umbilicus should be deferred to emergency department (ED) personnel. Policies and procedures should be developed that expressly explain it is inappropriate for a crewmember to examine a patient without a “chaperone.” Any accusation of inappropriate contact between prehospital providers and patients should be thoroughly investigated through a formal internal affairs mechanism.

Vaginal Bleeding

All patients of childbearing age with abdominal pain and vaginal bleeding should be treated as possible ectopic pregnancies until proven otherwise.2–4 Providers should be instructed to obtain IV access with use of supplemental oxygen for patients bleeding with an elevated heart rate, hypotension, or significant abdominal tenderness to palpation. An initial fluid bolus of 500 ml of normal saline (NS) during transport can be initiated if there are vital sign abnormalities. Evidence of hypotension in the setting of a “normal” heart rate can be a sign of intraperitoneal blood and would warrant more aggressive fluid resuscitation.5 A basic familiarity of the differential diagnosis of vaginal bleeding should be taught to prehospital providers (Table 31.1).

Evaluation of the Pregnant Patient

All levels of EMS providers, from first responders to paramedics, should be capable of rapidly ascertaining pertinent information from the ill or injured pregnant patient. BLS providers should be comfortable obtaining the core gestational information from the patient, including estimated due date/weeks of gestation, last menstrual period, number and type of previous deliveries, membrane rupture, bleeding, and contraction time intervals. ALS providers should be expected to expand that history and determine if the patient has had complications associated with the pregnancy such as gestational diabetes, preeclampsia, or preterm labor. As soon as it is determined that the patient is not going to deliver imminently, vital signs should be obtained and viewed in context of the normal physiologic changes of pregnancy (Table 31.2). If there is a history of precipitous delivery or the patient has the urge to push, a visual examination of the perineum should be performed. Medical directors should carefully craft strict protocols that specify when visual inspection of the perineum is appropriate. Failure to have a written document for the EMS provider to follow opens the provider, medical director, and system to potential liability.

Women of childbearing age who present with abdominal pain can obviously have a wide spectrum of disease etiologies.6 The EMS provider’s challenge, to identify life threats and initiate treatment during transport to the hospital, is made more difficult by the very fact that pregnancy status is often unknown by the patient. Prehospital clinical guidelines/protocols should reflect a general approach to vaginal bleeding and abdominal pain that covers early pregnancy complications as well as nonpregnancy-related causes of bleeding and pain.

When pregnancy status is known, quickly determining the trimester helps narrow the differential diagnosis.7 The goal for the EMS system is to quickly recognize and initiate treatment for the life-threatening problems that arise during pregnancy, labor, and delivery.

**TABLE 31.1**

<table>
<thead>
<tr>
<th>Differential Diagnosis of Vaginal Bleeding</th>
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<tbody>
<tr>
<td>Known pregnancy—first trimester</td>
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<tr>
<td>Ectopic pregnancy, threatened miscarriage/abortion, trauma</td>
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<tr>
<td>Known pregnancy—second and third trimester</td>
</tr>
<tr>
<td>Placenta previa, placental abruption, bloody show, trauma</td>
</tr>
<tr>
<td>Unknown pregnancy status</td>
</tr>
<tr>
<td>Ectopic pregnancy, dysfunctional uterine bleeding, degenerating fibroid, menses, trauma, cancer</td>
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**TABLE 31.2**

<table>
<thead>
<tr>
<th>Physiology Changes in Pregnancy</th>
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<tr>
<td>Blood volume increased by greater than 50%</td>
</tr>
<tr>
<td>Baseline heart rate increased 10%–15%</td>
</tr>
<tr>
<td>Respiration increased 10%–15%</td>
</tr>
<tr>
<td>Cardiac output increased</td>
</tr>
<tr>
<td>Blood pressure decreased or normal</td>
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TREATMENT OF THE PREGNANT PATIENT:
PREPARTUM COMPLICATIONS

First-Trimester Emergencies

For the prehospital provider, the key to treating a pregnant patient with early (i.e., first trimester) potential obstetric complications is maintaining a high index of suspicion for a possible ectopic pregnancy and recognizing hemodynamic instability secondary to hemorrhagic shock (see vaginal bleeding section). Although there is no directed prehospital intervention for ectopic pregnancies or miscarriages, crews should recognize the potential emotional distress associated with these conditions and offer psychological first aid.

Preeclampsia and Eclampsia

Preeclampsia and eclampsia are life-threatening emergencies requiring prompt recognition to initiate lifesaving care. Prehospital providers must be familiar with the signs and symptoms of preeclampsia (Table 31.3). Although they are infrequently encountered conditions in the out-of-hospital setting, EMS providers must be vigilant with measuring blood pressures in the advanced gestational patient. It should be continually reinforced with EMS crews that marginal increases in blood pressure are abnormal in pregnancy. Protocols should reflect that abnormal blood pressures in the pregnant patient require DMO if a patient is contemplating refusing transport to the hospital. Although the majority of obstetric calls likely do not benefit from peripheral IV access, pregnant women with elevated blood pressures are an important exception. The potential for difficult-to-control seizures exists in these patients, making IV access desirable. Seizing patients should promptly receive IV benzodiazepines. If IV access is unobtainable, many benzodiazepines can be delivered intramuscularly (IM) or per rectum. EMS units that carry magnesium should contact DMO for all pregnant patients with a diastolic pressure of greater than 100 and preeclamptic symptoms (e.g., headache, visual complaints, and abdominal pain). All eclamptic patients should receive 4 g of magnesium sulfate over 10 to 15 minutes.8 If no IV access can be established, 5 g of magnesium can be given IM in each buttock.9 Special attention should be made to maintaining an airway, monitoring respiratory function, and rapid transport to the hospital.

Placental Abruption and Previa

Bleeding in the late second or third trimester is most often associated with placental abruptions or previa. A placental abruption is a separation of the placenta from the uterine wall. It typically occurs following trauma, and prehospital providers should be continually educated on the small amount of force required to cause an abruption (ground level falls, low-speed motor vehicle collisions, and so on) Significant placental separation results in maternal hemodynamic instability and fetal distress. Nontraumatic abruptions can occur and are often associated with hypertension, smoking, and cocaine use. The hallmark of abruptions is the association between abdominal pain and bleeding late in pregnancy. The provider should gently palpate the abdomen to attempt to appreciate a firm globular uterus.

A placental previa is the result of placental implantation over the cervical os. This can result in heavy painless bleeding late in pregnancy. Providers should be instructed to only perform a visual inspection of the perineum when a patient has bleeding in the later half of pregnancy (to check for presenting parts). Any insertion of digits into the vagina of a woman with a potential placental previa can be catastrophic. Patients with either a placental abruption or previa should be treated for shock and quickly transported to an appropriate obstetric hospital if available.

Treatment of the Pregnant Patient: Antepartum Issues

Imminent Delivery

All women who are in active labor should receive supplemental oxygen and an IV line during transport. Clinical care guidelines should reflect that only truly imminent deliveries justify out-of-hospital delivery, and all reasonable efforts should be made to maximize

<table>
<thead>
<tr>
<th>Table 31.3 Signs and Symptoms of Preeclampsia</th>
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<tbody>
<tr>
<td>Systolic blood pressure greater than 160 mm Hg</td>
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<tr>
<td>Diastolic blood pressure greater than 110 mm Hg</td>
</tr>
<tr>
<td>Increasing pedal edema</td>
</tr>
<tr>
<td>Headache</td>
</tr>
<tr>
<td>Epigastric or right upper quadrant abdominal pain</td>
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the probability of an in-hospital delivery. If a delivery is deemed imminent, crews should ensure they have appropriate manpower to provide resuscitative care for the mother and baby. Obstetric and neonatal resuscitation equipment should be readied. Some recommend notifying DMO of an impending delivery, in case emergent assistance and advice is required. Deliveries in most cases progress with little intervention. Once the head is delivered, the nares and mouth should be suctioned out with a bulb syringe. The umbilical cord should be double clamped and divided after the remaining body is delivered. The baby should be immediately dried and evaluated. Inexpensive obstetric simulators are now available and ideal for scenario-based annual refresher training.

**Prolapse of the Umbilical Cord**

A prolapsed umbilical cord is one potential complication associated with vaginal deliveries. Clinical care guidelines should instruct the EMS provider not to push the cord back into the vagina. The provider should wrap the cord in moistened sterile gauze, and insert two fingers of a sterile gloved hand into the vagina to keep the presenting part off the pelvic brim. The patient is then placed in a knee-chest position to allow gravity to help take pressure off the cord and potentially improve umbilical blood flow and reduce the chance of hypoxia to the neonate. This maneuver should be maintained throughout transport to the hospital. If the delivery is imminent, the providers should proceed as previously discussed.

**Nuchal Cord**

A more common complication of vaginal deliveries is the finding of the umbilical cord wrapped around the baby’s neck. The provider should attempt to gently lift the cord over the head. If the cord is tight and cannot be lifted over the neonate’s head, the prehospital care provider should suction out the oral pharynx and nares before double clamping and cutting the cord. This maneuver will clear the airway and allow the neonate to breathe. The neonate should be delivered as quickly as possible.

**Meconium**

If thick meconium is present, EMS providers should first suction out the hypopharynx with a bulb syringe. The neonate should not be stimulated in the normal fashion so as not to induce a big respiratory effort. Depending on the level of training, equipment, and protocols, once the delivery is complete, a paramedic can intubate the neonate and suction through the endotracheal tube as it is being withdrawn from the airway. This procedure should be continued until the majority of the meconium has cleared or the newborn becomes bradycardic (<80 beats/min). The provider should not bag the neonate or stimulate it until the meconium is cleared. If a provider without those advanced skills is not available on scene, or if the neonate becomes bradycardic, the provider will need to ventilate and oxygenate the infant with a bag-valve-mask and 100% oxygen. Endotracheal intubation is not required if watery or thin meconium is present.

**Breech**

Breech presentations are high-risk deliveries. Frequently the presenting part does not adequately dilate the cervix, making spontaneous delivery difficult. Morbidity and mortality are significantly higher even when breech deliveries are attempted in an in-hospital obstetric suite. It is extremely challenging for DMO to give adequate instructions over the radio or phone in the midst of a breech delivery. A reasonable approach is to have the prehospital providers support the presenting part, begin moving toward the hospital, and let the delivery occur spontaneously if possible. When the head presents, the EMS providers can place two fingers forming a “V” into the vagina to allow the neonate to breathe. Oxygen should be administered to the mother. The presenting part should never be forcibly pushed back into the vagina.

**Shoulder Dystocia**

In most deliveries the shoulders are delivered easily. Unfortunately, if the shoulders become impeded the potential for a catastrophic outcome is real. The EMS providers should be trained to have an assistant or family member hyperflex the mother’s hip against her abdomen and then apply mild suprapubic pressure (McRoberts Maneuver). Gentle posterior traction of the head can also help to relieve the dystocia. If these maneuvers do not work, DMO should instruct the provider to rotate the shoulders while suprapubic pressure is being applied. This can be accomplished by having the provider apply two fingers on the front part of the top shoulder (anterior) and rotate the neonate toward the back into an oblique position (Corkscrew maneuver). If this does not facilitate the delivery, the mother can be instructed to rotate over into an upright position on her hands and knees. If all these maneuvers still do not facilitate delivery, the crew should expedite transport to the hospital.
These situations are extremely stressful for experienced obstetricians, no less a provider with minimal formal obstetrical training.

**Post-Delivery: Care of the Neonate**

Once the umbilical cord is clamped and cut, the neonate should be placed in a supine, head down position with the head turned to the side. Normally, the newborn begins to breathe and cry almost immediately after birth. If respirations do not occur or are infrequent, suctioning of the mouth and pharynx should be performed. Stimulating the feet or back may also initiate breathing. The neonate should be dried and kept warm. If the neonate is stable, the infant can be held close to the mother’s chest to decrease heat loss.

A standardized method to evaluate the newborn’s condition is the 1- and 5-minute APGAR scores (Table 31.4). Scores between 4 and 6 at 1 minute may indicate a mildly to moderately depressed infant, whereas scores below 3 represent a severely depressed infant. If warming and stimulating the neonate do not initiate the infant’s respirations, the prehospital provider will need to begin resuscitating the infant according to standard Pediatric Advanced Life Support (PALS) algorithms.

IV access is not necessary in the prehospital setting unless the neonate requires ongoing and active resuscitation. Even then, it should only be performed if adequate hands exist to accomplish all other first-line resuscitative efforts. If the baby is in distress, transport should be immediately initiated to the closest appropriate facility.

**Postpartum Hemorrhage**

Blood loss of greater than 500 ml after the third stage of labor is considered abnormal. Bleeding can occur anywhere along the reproductive tract. Bleeding at the placenta is usually controlled by uterine contractions. Early postpartum bleeding is usually either from uterine atony or lacerations to the genital tract (Table 31.5). If bleeding is significant, an abdominal examination should be performed to evaluate the uterus. A soft and boggy uterus is suggestive of uterine atony. If the uterus is firm and contracted, the source of bleeding is most likely a laceration of the genital tract. Unfortunately, these findings are often difficult to discern in the field. Out-of-hospital treatment is mainly IV crystalloids and oxygen. The provider should expedite transport of the patient to the hospital.

**Delivery of the Placenta**

The placenta normally delivers spontaneously. The prehospital care provider should not delay transport for delivery of the placenta. Physical signs that the placenta is about to be delivered include the uterus becoming globular in shape, the umbilical cord lengthening, and a potential gush of blood just prior to the delivery. If the placenta is delivered before arrival to the hospital, the placenta should be saved for pathologic evaluation.

## TREATMENT OF THE PREGNANT PATIENT: SPECIAL CONSIDERATIONS

### Pregnant Trauma Patient

The pregnant trauma patient represents an especially difficult challenge in the prehospital setting. Much like eclampsia, its low frequency but high consequence relationship makes it an ideal topic for EMS continuing medical education. Basic trauma life support should be carried out according to local trauma management protocols. Airway and hemorrhage control, high-flow oxygen, immobilization, and rapid

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<tr>
<th>TABLE 31.4</th>
<th>APGAR Scoring System</th>
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<tr>
<td><strong>Sign</strong></td>
<td><strong>0</strong></td>
</tr>
<tr>
<td>Heart rate</td>
<td>Absent</td>
</tr>
<tr>
<td>Respiratory effort</td>
<td>Absent</td>
</tr>
<tr>
<td>Muscle tone</td>
<td>Flaccid</td>
</tr>
<tr>
<td>Reflex irritability</td>
<td>No response</td>
</tr>
<tr>
<td>Color</td>
<td>Blue, pale</td>
</tr>
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Transport to an appropriate facility remain top priorities. Severity of injury can be difficult to determine in the traumatized pregnant patient. Although normal physiologic vital sign changes seen with pregnancy can mimic shock (see Table 31.2), the pregnant patient’s elevated blood volume can allow for massive blood loss before decompensation. Respiratory reserve obviously becomes increasingly limited as the pregnancy advances. EMS protocols should reflect that seemingly minor trauma (e.g., ground level falls, low speed motor vehicle accidents) can cause placental abruption and require transport to an appropriate facility.

All supine pregnant trauma patients in the second and third trimester should be transported tilted roughly 15 degrees to the left. (The right side of a long back board can be lifted approximately 15 degrees with blankets or sand bags). This positioning allows the uterus to be moved off the inferior vena cava, and facilitates blood return to the heart and maintains uterine blood perfusion.17,18

### Pregnant Patient in Cardiac Arrest

Cardiac arrest resuscitation strategy for the pregnant patient who is more than 20 weeks along differs fundamentally from the nongestational patient in that scene interventions should be extremely minimal and immediate transport is the highest priority. Similar to the scene evaluation of a traumatized patient, EMS providers are directed to “load and go” and perform all interventions and resuscitation measures en route to the hospital. The primary directive during transport is to maximize maternal resuscitative measures. EMS providers must focus on external chest compressions in an attempt to maintain some degree of perfusion to the fetus. The success of perimortem caesarean section in the ED correlates directly with the length of time the patient has been in cardiac arrest. There are reported cases of good neurologic outcome of the neonate if the caesarean section is done within the first 5 minutes of the arrest.19-23

### SUMMARY

Most obstetric and gynecologic requests for EMS in the out-of-hospital setting require little more than an uneventful transport to the hospital. But obstetric calls in particular can challenge the most experienced provider and have the potential for catastrophic complications. Medical directors should work with their crews and educators to ensure these topics are reviewed frequently. Simulators should be used when possible. Symptom-based clinical care guidelines should be written to reflect that women with abdominal pain often do not know their pregnancy status. Crews should be encouraged to safely transport laboring patients to the hospital for delivery unless imminent signs of delivery exist. Protocols must reflect that all pregnant trauma patients and all hypertensive pregnant patients require evaluation in the ED. Crews should be encouraged to contact DMO early both for guidance and to allow obstetric and neonatal personnel an opportunity to respond to the ED for pregnant patients in extremis if necessary. Any opportunity to bring EMS providers to labor and delivery for refresher training should be aggressively pursued.

### Late Postpartum Hemorrhage

<table>
<thead>
<tr>
<th>Early Postpartum Hemorrhage</th>
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<tbody>
<tr>
<td>Uterine atony</td>
</tr>
<tr>
<td>Laceration</td>
</tr>
<tr>
<td>Retained placenta</td>
</tr>
<tr>
<td>Uterine rupture</td>
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<tr>
<td>Uterine inversion</td>
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</tbody>
</table>

**CLINICAL VIGNETTE**

A 26-year-old female is undergoing a planned home birth under the treatment of a local midwifery service. It is her second child and she goes into labor at the 39th week of her pregnancy. Her first child was delivered vaginally in the hospital without complication. The midwife calls 9-1-1 for emergency assistance when she recognizes the birth is being complicated by a shoulder dystocia. On first...
responder arrival (BLS fire/rescue engine crew), they 
are instructed by the midwife to assist by flexing and 
abducting the maternal thighs (McRoberts maneu-
ver) against the abdomen. An additional crew mem-
ber places the mother on supplemental oxygen. The 
midwife attempts to perform the Corkscrew man-
euver without success. An ALS ambulance crew ar-
rives on scene and performs a brief assessment and 
immediately contacts DMO. The physician on the 
base radio advises them to reposition the mother 
upright on her hands and knees. With the mother 
on her knees, the midwife is able to “corkscrew” out 
the anterior shoulder and the baby delivers sponta-
neously. With low initial APGAR scores, the baby 
is dried, warmed, and aggressively stimulated. He is 
placed on supplemental oxygen and almost imme-
diately his cry, color, and muscle tone begin to im-
prove. The mother and baby are transported to the 
hospital without further incident or complication.

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