Obstetrical Emergencies

EMS Continuing Education Technician through Technician-Advanced Paramedic

Consistent with the National Occupational Competency Profiles as developed by Paramedic Association of Canada and “An Alternate Route to Maintenance of Licensure” as developed by Manitoba Health

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Revised August 2010
Disclaimer

These documents were developed for improved accessibility to “An Alternative Route to Maintenance of Licensure” for all paramedics in Manitoba. Regional implementation of Alternate Route is at the discretion of the local EMS Director.

This is a supportive document to the National Occupational Competency Profiles and “An Alternative Route to Maintenance of Licensure.” It is not the intent that this package be used as a stand-alone teaching tool. It is understood that the user has prior learning in this subject area, and that this document is strictly for supplemental continuing medical education. To this end, the Paramedic Association of Manitoba assumes no responsibility for the completeness of information contained within this package.

It is neither the intent of this package to supercede local or provincial protocols, nor to assume responsibility for patient care issues pertaining to the information found herein. Always follow local or provincial guidelines in the care and treatment of any patient.

This package is to be used in conjunction with accepted models for education delivery and assessment, as outlined in “An Alternative Route to Maintenance of Licensure”.

This document was designed to encompass all licensed training levels in the province Technician, Technician-Paramedic, Technician-Advanced Paramedic. Paramedics are encouraged to read beyond their training levels. However, the written test will only be administered at the paramedic’s current level of practice.

All packages have been reviewed by the Paramedic Association of Manitoba’s Educational Subcommittee and physician(s) for medical content.

As the industry of EMS is as dynamic as individual patient care, the profession is constantly evolving to deliver enhanced patient care through education and standards. The Paramedic Association of Manitoba would like to thank those practitioners instrumental in the creation, distribution, and maintenance of these packages. Through your efforts, our patient care improves.

This document will be amended in as timely a manner as possible to reflect changes to the National Occupational Competency Profiles, provincial protocols/Emergency Treatment Guidelines, or the Cognitive Elements outlined in the Alternate Route document.

Any comments, suggestions, errors, omissions, or questions regarding this document may be referred to info@paramedicsofmanitoba.ca, attention Director of Education and Standards.
**Introduction:**

This package will address pregnancy and childbirth and the complications associated with them. It is important to remember that childbirth is a natural process and occurs daily. Complications are uncommon, but when they do occur, they must be recognized rapidly and managed accordingly.

**Conventions Used in this Manual**

Black lettering without a border is used to denote information appropriate to the Technician Level and above.

Text with the single striped border on the left is information appropriate to Technician-Paramedic and above.

Text with the double striped border on the left is information appropriate to Technician-Advanced Paramedic and above.
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Obstetrical Emergencies

Anatomy and Physiology of the Female Reproductive System

The reproductive system of the female consists of two ovaries, two fallopian tubes, the uterus, vagina, and external genitals.

![Diagram of the female reproductive system](image)

*The female reproductive system consists of the ovaries, fallopian tubes, uterus, cervix, and vagina.*

**Ovaries**

The ovaries, or female gonads, are small, walnut-sized organs adjacent to the uterus. They are responsible for producing a portion of the female hormones and for production of the female component of reproduction, the ovum.

**Fallopian Tubes**

The fallopian tubes are hollow tubes connecting the ovary to the uterus. They transport the ovum to the uterus. Fertilization usually occurs in the fallopian tube, which is open at the end adjacent to the ovary. This provides direct access to the abdominal cavity and to
the uterus. The fallopian tube is a source of infection (salpingitis), especially in pelvic inflammatory disease (PID).

**Uterus**

The uterus is a hollow, muscular organ, situated low in the pelvis. A portion of it, the cervix, extends into the vagina. The superior part of the uterus is called the fundus. The uterus is the site of implantation and development of the fetus.

**Vagina**

The vagina extends from the uterus to the vulva. It is the female organ of copulation and the birth canal. The external opening of the vagina is called the introitus.

**Vulva**

The vulva is the external female genitalia. It consists of the labia majora, labia minora, and accessory glands.

**Anatomy and Physiology of the Obstetric Patient**

Pregnancy begins with fertilization of the ovum. Ovulation is the growth and discharge of an egg, or ovum, from the ovary. The ovum develops under the influence of the hormones, estrogen and progesterone. Fourteen days before the beginning of the next menstrual period, the ovum is released from the ovary into the abdominal cavity. It then enters the wide opening of the fallopian tube, where it is transported to the uterus.

If the woman has had intercourse within 24 to 48 hours before ovulation, fertilization may occur in the fallopian tube. Fertilization is the combination of the female ovum and the male spermatozoa. After fertilization, the ovum begins to divide immediately. The fertilized ovum continues down the fallopian tube to the uterus, where it ultimately attaches itself to the inner lining of the uterus. This process is called implantation.

The placenta, which is the organ of exchange between mother and fetus, develops early in pregnancy. The placenta has several important functions for the developing fetus. It provides for the exchange of respiratory gases, transport of nutrients from the mother to the fetus, excretion of wastes, and transfer of heat. In addition, the placenta becomes an active endocrine gland, producing several important hormones.

The placenta is attached to the developing fetus by the umbilical cord. This cord normally contains two arteries and one vein. The umbilical vein transports oxygenated blood toward the fetus, while the umbilical arteries return relatively deoxygenated blood to the placenta.
The amniotic sac also develops early in pregnancy. The amniotic sac consists of membranes that surround and protect the developing fetus. Eventually, the amniotic sac will fill with amniotic fluid, which cushions the fetus against trauma and provides a stable environment in which the fetus can develop. The volume of amniotic fluid, approximately 1000 mls, is maintained by the fetus’ continual swallowing of fluid as well as continual urination.

**Fetal Development**

Fetal development begins immediately after implantation and is very complex. There are a few developmental milestones with which paramedics should be familiar. First, the normal duration of pregnancy is 40 weeks from the first day of the mother’s last menstrual period. This is equal to 10 lunar months or, roughly, 9 calendar months. The time at which fertilization occurs is called conception. Conception occurs approximately 14 days after the first day of the last menstrual period. With this knowledge, it is possible to calculate, with fair accuracy, the approximate date the baby should be born. This date is commonly called the due date. Medically, it is known as the estimated date of confinement (EDC). The mother is usually told this date on her first prenatal visit.

During normal fetal development, the sex of the infant can usually be determined by the end of the third month. By the end of the fifth month, fetal heart tones (FHTs) can be detected by stethoscope. The mother also has generally felt fetal movement by this time. By the end of the sixth month, the baby may be able to survive if born prematurely. Fetuses born after the end of the seventh month have an excellent chance of survival. By the middle of the ninth month the baby is considered term, or fully developed.

Generally, pregnancy is divided into trimesters. Each trimester is approximately 13 weeks, or three calendar months. Most of the fetus’ organ systems develop during the first trimester. Therefore, this is when the fetus is most vulnerable to the development of birth defects.

*Human fetus at the end of the first trimester.*

Diagram found on page 377 of The Basic EMT, 2nd edition
Assessment of the Obstetrical Patient

The initial approach to the obstetrical patient should be the same as for the non obstetrical patient, with special attention paid to the developing fetus. Complete the initial and ongoing assessment quickly. It is important that the members of the EMS team display a calm, reassuring and professional manner and work in a cooperative manner with other allied health care providers.

When delivery is imminent, additional EMS personnel should be requested because there is a potential for two patients (mother and newborn) who require emergency care. EMS personnel should be aware of their role and responsibilities in the event that a home delivery attended by midwives has taken place. EMS personnel must obtain a focused medical and obstetrical history including the following:

- Date of expected birth and current gestation
- History of the current pregnancy:
  - prenatal care
  - any problems during pregnancy
  - time of onset of contractions
  - frequency and duration of contractions
  - status of membranes: intact or ruptured
  - evidence of meconium staining
- Anticipated problems with delivery of current pregnancy:
  - multiple gestation
  - expected large or small birth weight
  - abnormal placental location
- History of prior pregnancies and deliveries:
  - length of previous labour
  - number of live births
  - history of postpartum hemorrhage
  - history of premature or abnormal labour or delivery
  - c-section or vaginal delivery
- Past medical history

Consider delivering the baby at the scene in the following circumstances:

- When delivery can be expected within a few minutes
- When a natural disaster, bad weather, or some other type of catastrophe makes it impossible to reach the hospital
- When no transportation is available
How do you determine whether delivery is going to occur within a few minutes? First, look for crowning. Explain to the mother what is being done and why. Drape the mother and ensure her privacy. Second, ask the mother these questions:

- Are you having contractions? How far apart are the contractions?
- How long do the contractions last?
- Do you feel as though you have to strain or move your bowels?
- Have you had any showing or spotting?
- Have you had any gushing of fluid from the vagina?
- Were any of your previous children delivered by cesarean section?

Also consider asking the following questions:

- Have you had a complicated pregnancy in the past?
- What did your last ultrasound (sonogram) show?
- Do you use any drugs or take any medications? Do you have any allergies?
- Is there any possibility that this is a multiple birth?
- Have you seen a doctor throughout the pregnancy? Does he/she expect any complications?

If the patient is in pain, try to determine when the pain started and whether its onset was sudden or slow. Also, attempt to define the character of the pain—its duration, location, and radiation, if any. It is especially important to determine whether the pain is regular.

**Physical Examination**

Generally, vital signs in the pregnant patient should be taken with the patient lying on her left side. As pregnancy progresses, the uterus increases in size. By the third trimester when the patient is supine, the weight of the uterus compresses the inferior vena cava, severely compromising venous blood return from the lower extremities. Turning the patient to her left side alleviates this problem. The blood pressure tends to be lower during pregnancy, and the pulse rate is faster (10-15 beats per minute). This is because of normal changes occurring in the cardiovascular system.

**First Trimester Complications**

**Vaginal Spotting or Bleeding**

Vaginal bleeding during pregnancy is always a cause for concern. Bleeding early in pregnancy is often caused by spontaneous abortion, ectopic pregnancy, or vaginal trauma.

**Miscarriage**

Miscarriage is the termination of a pregnancy before the fetus is viable, generally considered to be about 20 weeks gestation. The terms “miscarriage” and “abortion” can
be used interchangeably. Generally, people think of abortion as termination of pregnancy at maternal request and of miscarriage as an accident of nature. Medically, the term “abortion” refers to both types of fetal loss. Often, abortion results from fetal defects or maternal infection. The Classifications of abortion include:

**Spontaneous Abortion**
A spontaneous abortion, commonly called a miscarriage, occurs of its own accord. Most spontaneous abortions occur before the twelfth week of pregnancy. Many occur within two weeks after conception and are mistaken for menstrual periods.

**Threatened Abortion**
A threatened abortion is a pregnancy in which the cervix is slightly open and the fetus remains in the uterus and is still alive. In some cases of threatened abortion, the pregnancy can still be salvaged.

**Inevitable Abortion**
An inevitable abortion is one in which the fetus has not yet passed from the uterus, but the pregnancy cannot be salvaged.

**Incomplete Abortion**
An incomplete abortion is one in which some, but not all, fetal tissue has been passed. Incomplete abortions are associated with a high incidence of infection.

**Assessment for Miscarriage**
Most women who are having miscarriages will experience vaginal bleeding. Often, women who have first-trimester miscarriages report passing tissue or excessive clotting. In late first-trimester and second-trimester miscarriages, a recognizable fetus may be passed. In addition, there will often be significant abdominal cramping and pain. If the abortion was not recent, then frank signs and symptoms of infection may be present.

The physical examination should include orthostatic vital signs, if possible. Any tissue or large clots should be retained and given to emergency department personnel.
Management for Miscarriage

The miscarriage patient should be treated in the same manner as any patient at risk for hypovolemic shock.

- Initial survey
- Obtain a history etc.
- Record vital signs
- Initiate load and go
- Place bulky dressings against the vaginal opening, if necessary
- Position the patient on her left side
- Treat for shock
- Perform a detailed assessment en route
- Bring the fetus or any tissue to the health care facility
- Transport to the nearest appropriate health care facility
- Notify the receiving facility while en route

Administer oxygen, and establish an I.V. if certified to do so. If the patient is bleeding severely and shock is impending, establish a second I.V. Due to the possibility for need of rapid bolus and/or blood administration, the largest bore I.V. possible should be initiated (16 or 18ga).

If the miscarriage occurs during or following the late first trimester, a fetus may be passed. Often, the placenta does not detach, and the fetus is suspended by the umbilical cord. In such a case, place the umbilical clamps from the OB kit on the cord and cut it. Carefully wrap the fetus in linen or other suitable material, and transport it to the hospital with the mother.

A miscarriage is a very sad time. Provide emotional support to the parents. Parents who wish to view the fetus should be allowed to do so. Occasionally, parents request baptism of the fetus. This can be performed by making the sign of the cross and stating, “I baptize you in the name of the Father, the Son, and the Holy Spirit. Amen.”

**Ectopic Pregnancy**

An ectopic pregnancy, the implantation of a fertilized ovum outside of the uterus, occurs once in approximately 200 pregnancies. The most common implantation site is in a fallopian tube. However, the ovum can attach to an ovary or anywhere in the abdominal cavity.

An ectopic pregnancy is a medical emergency. The developing fetus can grow so large that it may rupture the fallopian tube, causing extensive bleeding into the pelvis and abdominal cavity. Women can die from the complications of ruptured ectopic pregnancies.
Several predisposing factors can lead to ectopic pregnancy. They include previous pelvic infections, such as PID, pelvic adhesions from prior abdominal surgery, tubal ligations, or the presence of an IUD. All of these tend to scar the fallopian tube, thus preventing transport of the fetus to its normal implantation site into the uterus.

Most patients with an ectopic pregnancy have abdominal pain, which may be severe. Often, there is associated vaginal bleeding. In 15-20 percent of cases, women report shoulder pain, which is probably referred pain. Many patients report a missed period or intermittent spotting over 6-8 weeks. Patients often report pregnancy-associated symptoms, such as breast tenderness, nausea, vomiting or fatigue. Many patients report a prior history of PID, tubal ligation, previous ectopic pregnancy, or pelvic surgeries.

**Assessment of Ectopic Pregnancy**

The patient with ectopic pregnancy is at risk for the rapid development of shock. Take vital signs frequently and regularly. Orthostatic vital signs may be helpful, unless the patient is in frank shock. The abdominal examination may reveal significant lower quadrant tenderness, often more pronounced on one side than the other. Rebound tenderness or rigidity may be present. Avoid repeated abdominal examination, as this may cause the ectopic pregnancy to rupture. Vaginal bleeding may range from spotting to profuse hemorrhage. Do not perform a vaginal examination in the field.

**Management of Ectopic Pregnancy**

Ectopic pregnancy is difficult to diagnose in the field. However, a patient suspected of suffering ectopic pregnancy should be handled like any patient in shock or at risk of hypovolemic shock. The patient should receive high-flow oxygen and ventilatory support as indicated. Start an IV if certified to do so. Repeat vital signs regularly. The patient should be positioned on her left side and transport should be rapid, as prompt surgical intervention is required. Be sure to obtain a focused history, including the date of last menstrual period and expected date of delivery. Initiate load and go to health care facility capable of operative obstetrics, if available.

**Third Trimester Complications**

Although third trimester bleeding can be caused by injury to the vagina or cervix, it most often results from one of two conditions: abruptio placentae or placenta previa. Vaginal bleeding can range from simple spotting to life-threatening hemorrhage. Generally, the exact etiology of vaginal bleeding during pregnancy cannot be determined in the field. With antepartum hemorrhage, including abruptio placentae, placenta previa and uterine rupture, the treatment is as follows:

- Initial Survey
- Obtain a history
➤ Record vital signs
➤ Initiate load and go
➤ Place bulky dressings against the vaginal opening, if necessary
➤ Position the patient on her left side
➤ Treat for shock
➤ Perform a detailed assessment en route
➤ Transport to the nearest appropriate health care facility
➤ Notify the receiving facility while en route

**Abruptio Placentae**

Abruptio placentae is the premature separation of the placenta from the wall of the uterus. Separation can be either partial or complete. Complete separation almost always results in death of the fetus. Several factors may predispose a patient to abruptio placentae. These include preeclampsia, maternal hypertension, multiparity, abdominal trauma, or an extremely short umbilical cord.

When abruptio placentae occurs, blood tends to collect behind the separating placenta. As a result, vaginal blood loss is minimal. If the placenta is not completely separated, it may apply pressure on the bleeding uterine wall. If the placenta separated completely, this pressure is lost and severe hemorrhage can occur quite suddenly.

![Graphic](https://example.com/)

*In abruptio placentae, the placenta separates prematurely from the wall of the uterus.*

**Assessment for Abruptio Placentae**

Most frequently, patients suffering abruptio placentae have constant, severe abdominal pain. Often, the patient says that the pain feels like “something is tearing.” The abdomen is very tender. Vaginal bleeding may range from absent to very heavy. If present, bleeding will be very dark in colour. Occasionally, the patient has a history of abruptio placentae in previous pregnancies.
Physical examination will reveal a very tender uterus that may feel tightly contracted. Do not perform a vaginal examination in the field.

**Management for Abruptio Placentae**

In abruptio placentae there are two lives at stake. First, administer oxygen at high concentration. The fetus also receives oxygen when it is administered to the mother, unless complete abruption has occurred. Second, establish one or two large-bore IV’s, if certified to do so. Monitor vital signs continuously. Transport the patient rapidly. If the fetus is still viable, the definitive treatment is cesarean section.

**Placenta Previa**

Placenta previa is the attachment of the placenta very low in the uterus so that it partially or completely covers the internal cervical os, or opening. There are three categories of placenta previa: complete, partial, and marginal. Complete placenta previa completely covers the internal cervical os and is, fortunately quite rare. Partial placenta previa is partial coverage of the internal cervical os by the placenta. Marginal placenta previa occurs when the placenta is adjacent to the cervical os but does not extend over it. Marginal or partial placenta previa occurs in approximately 1 out of every 200 pregnancies. Predisposing factors include multiparity, maternal age greater than 35, and pregnancies in rapid succession.

Implantation of the placenta occurs early in pregnancy. Unless a sonogram is done, placenta previa is usually not detected until the third trimester. At that time, when fetal pressure on the placenta increases, or uterine contractions begin, the cervix effaces, or thins out, resulting in placental bleeding. In addition, sexual intercourse or digital examination can precipitate bleeding from placenta previa.

*Graphic found on page 502, Emergency Care & Transportation of the Sick & Injured, 7th edition*
Assessment of Placenta Previa

The patient with placenta previa is usually a multigravida (a woman who has been pregnant more than once) in her third trimester of pregnancy. She may have a history of prior placenta previa or bleeding early in the current pregnancy. She may report a recent episode of sexual intercourse or vaginal examination just before bleeding began, or she may not bleed until the onset of labor.

The most common sign of placenta previa is painless, bright red vaginal bleeding. In fact, any painless bleeding in pregnancy is considered placenta previa unless proven otherwise. The bleeding may or may not be associated with uterine contractions. The uterus is usually soft, and the fetus may be in an unusual presentation. VAGINAL EXAMINATION SHOULD NEVER BE ATTEMPTED AS AN EXAMINING FINGER CAN PUNCTURE THE PLACENTA, CAUSING A FATAL HEMORRHAGE.

As with abruptio placentae, there are two lives at stake. Treatment should include the following steps. First, administer oxygen at high concentration. Second, establish one or two large-bore IV’s if certified to do so. Third, monitor vital signs continuously. Transport the patient rapidly. If the fetus is still viable, the definitive treatment is cesarean section.

Uterine Rupture

Uterine rupture is the actual tearing, or rupture, of the uterus. It usually occurs during labor or at its onset. However, it can also occur before labor with abdominal trauma. During labor, it often results from tetanic uterine contractions or a surgically scarred uterus, such as that which occurs from a previous cesarean section. It can also occur following a prolonged or obstructed labor, as in the case of cephalopelvic disproportion or in conjunction with abnormal presentations.

Assessment of Uterine Rupture

The patient with uterine rupture will often be in shock. There may be a history of continuous abdominal pain that has increased in intensity. Labor may have started, and then appeared to have stopped when the uterus ruptured. On physical examination, there is often profound shock without evidence of external hemorrhage. The abdomen is often tender and rigid and may exhibit rebound tenderness.

Management of Uterine Rupture

Management is the same as for any patient in shock. Administer oxygen at high concentration. Next, establish one or two large-bore IV’s if certified to do so. Monitor
vital signs. Transport the patient rapidly. If the fetus is still viable, the definitive treatment is cesarean section with subsequent repair or removal of the uterus.
### Differentiation of Abruptio Placentae, Placenta Previa, and Uterine Rupture

<table>
<thead>
<tr>
<th>History</th>
<th>Bleeding</th>
<th>Abnormal Pain</th>
<th>Abdominal Examination</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Abruptio Placentae</strong></td>
<td>Single attack of scant, dark, vaginal bleeding (often concealed) that continues until delivery</td>
<td>Present</td>
<td>Localized uterine tenderness</td>
</tr>
<tr>
<td>Association with toxemia of pregnancy and hypertension of any cause</td>
<td></td>
<td></td>
<td>Labour</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Absent fetal heart tones (often)</td>
</tr>
<tr>
<td><strong>Placenta Previa</strong></td>
<td>Repeated “warning” hemorrhages over days to weeks</td>
<td>Usually absent</td>
<td>Lack of uterine tenderness (usually)</td>
</tr>
<tr>
<td>Lack of association with toxemia of pregnancy</td>
<td></td>
<td></td>
<td>Labour (rare)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fetal heart tones (usually)</td>
</tr>
<tr>
<td><strong>Uterine Rupture</strong></td>
<td>Possible bleeding</td>
<td>Usually present and associated with sudden onset of nausea and vomiting</td>
<td>Diffuse abdominal tenderness</td>
</tr>
<tr>
<td>Previous cesarean section</td>
<td></td>
<td></td>
<td>Sudden cessation of labour</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Possible fetal heart tones</td>
</tr>
</tbody>
</table>

**Supine Hypotension Syndrome**

Supine hypotension syndrome usually occurs in the third trimester of pregnancy. The increased mass and weight of the gravid uterus compresses the inferior vena cava when the patient is supine, markedly decreasing blood return to the heart and reducing cardiac output. Some patients are predisposed to this problem because of an overall decrease in blood volume or because of anemia.

**Assessment of Supine Hypotension**

As mentioned previously, the supine hypotension syndrome usually occurs in a patient late in her pregnancy who has been supine for a period of time. Question the patient about prior episodes of a similar nature and about any recent hemorrhage or fluid loss. The physical examination should be directed at determining whether the patient is volume depleted.
Management of Supine Hypotension

If there are no indications of volume depletion, such as decreased skin turgor or thirst, place the patient in the left lateral recumbent position. Monitor maternal vital signs frequently. If there is clinical evidence of volume depletion, administer oxygen and start an IV if certified to do so. Monitor vital signs, and SAED monitor. Transport the patient promptly.

**Hypertensive Disorders of Pregnancy**

In addition to vaginal bleeding, you should be aware of pregnancy-associated problems known collectively as hypertensive disorders of pregnancy (formerly known as “toxemia of pregnancy”). These disorders are characterized by hypertension, weight gain, edema, protein in the urine, and, in late stages, seizures. Hypertensive disorders of pregnancy occur in approximately 5 percent of pregnancies. They are thought to be caused by abnormal vasospasm in the mother, which results in increased blood pressure and other associated symptoms. These disorders include pre-eclampsia and eclampsia.

**Pre-eclampsia**

Pre-eclamptic patients are those that have hypertension, abnormal weight gain, edema, headache, protein in the urine, epigastric pain, and, occasionally, visual disturbances. If untreated, pre-eclampsia may progress to the next stage, eclampsia.

**Eclampsia**

Eclampsia is the most serious manifestation of the hypertensive disorders of pregnancy. It is characterized by grand mal seizure activity. Eclampsia if often preceded by visual disturbances, such as flashing lights or spots before the eyes. Also, the development of epigastric pain or pain in the right upper abdominal quadrant often indicates impending seizure. Eclampsia can be distinguished from epilepsy by the history and physical appearance of the patient. Patients who become eclamptic are usually edematous and have a markedly elevated blood pressure, while epileptics usually have a prior history of seizures and are taking anticonvulsant medications.

The hypertensive disorders of pregnancy tend to occur most often with a woman’s first pregnancy. They also appear more frequently in patients with pre-existing hypertension. Diabetes mellitus is also associated with an increased incidence of this disease process. Patients who develop pre-eclampsia are at an increased risk for cerebral hemorrhage, the development of renal failure, and pulmonary edema. Patients who are pre-eclamptic have intravascular volume depletion, since a great deal of their body fluid is in the third space. If eclampsia develops, death of the mother and fetus frequently results.
Assessment of Hypertensive Disorders

Developing an accurate history is extremely important whenever you suspect one of the hypertensive disorders of pregnancy. Question the patient about excessive weight gain, headaches, visual problems, epigastric or right upper quadrant abdominal pain, apprehension, or seizures.

On physical exam, patients with pre-eclampsia are usually markedly edematous. They are often pale and apprehensive. The reflexes are hyperactive. The blood pressure, which is usually elevated, should be taken after the patient has rested for 5 minutes in the left lateral recumbent position.

Management of Hypertensive Disorders

Definitive treatment of the hypertensive disorders of pregnancy is delivery of the fetus. However, in the field, use the following management tactics to prevent dangerously high blood pressures or seizure activity.

Pre-eclampsia: The patient who is hypertensive and shows other signs and symptoms of pre-eclampsia, such as edema, headaches, and visual disturbances, should be treated quickly.

- Establish ABC’s.
- Obtain a history.
- Handle the patient gently, keep the patient calm, and dim the lights.
- Prepare for possible seizures.
- Initial survey
- Record vital signs
- Initiate load and go
- Place the patient in the left lateral recumbent position, and quickly carry out a rapid and detailed assessment.
- Begin an IV if certified to do so.
- Transport the patient rapidly, without lights or sirens.
- Notify the receiving facility while en route

Eclampsia. If the patient has already suffered a seizure or a seizure appears to be imminent, then, in addition to the above measures, administer oxygen and manage the airway appropriately.

Premature Labor and Braxton-Hicks Contractions

It is occasionally difficult to determine the onset of labor. For many weeks before labour begins, the uterus contracts irregularly, thus conditioning itself for the birth process. As the EDC approaches, these contractions become more frequent. Ultimately, the
contractions become stronger and more regular, signaling the onset of labor. Labor consists of uterine contractions that change the dilation or effacement of the cervix. The contractions of labor are firm, fairly regular, and quite painful. Braxton-Hicks contractions, occasionally called false labor, are generally less intense than labor contractions and do not change the cervix.

It is virtually impossible to distinguish false labor from true labor in the field. Distinguishing the two requires repeated vaginal examinations, over time, to determine whether the cervix is effacing or dilating. This, of course, should not be done in the field. Therefore, all patients with uterine contractions should be transported to the hospital for additional evaluation.

Braxton-Hicks contractions do not require treatment by the paramedic aside from reassurance of the patient and, if necessary, transport for evaluation by a physician. True labor that begins before the 38th week of gestation, referred to as preterm labor, may require intervention. Many conditions may lead to preterm labor, including premature rupture of the membranes and abnormalities in the cervix or uterus. In many cases, physicians attempt to stop preterm labor to give the fetus additional time to develop in the uterus.

**Assessment of Premature Labour**

When confronted by a patient with uterine contractions, first determine the approximate gestational age of the fetus. If it is less than 38 weeks, then preterm labor is suspected. If gestational age is greater than 38 weeks, the patient should be treated as a term patient.

After determining gestational age, obtain a brief obstetrical history. Then question the mother about the urge to push or the need to move her bowels or urinate. She should also be questioned about the status of her membranes. Any sensation of fluid leakage or “gushing” from the vagina should be interpreted as ruptured membranes until proven otherwise. Next, palpate the contractions by placing your hand on the patient’s abdomen. Note the intensity and length of the contractions, as well as the interval between contractions.

**Management of Premature Labour**

Premature labor, especially if quite early, should be stopped if possible. The process of stopping labor, or tocolysis, is NOT done in the field and the preterm labor patient must be transported immediately.
**Trauma**

Paramedics may receive calls to help a pregnant woman who has been in a motor vehicle accident or who has sustained a fall. In pregnancy, syncope occurs frequently. The syncope of pregnancy often results from compression of the inferior vena cava or from normal changes in the cardiovascular system associated with pregnancy. Also, the weight of the gravid uterus alters the patient’s balance, making her more susceptible to falls.

Pregnant victims of major trauma are more susceptible to life-threatening injury than are non-pregnant victims, because of the increased vascularity of the gravid uterus. Generally, the amniotic fluid cushions the fetus from blunt trauma fairly well. However, in direct abdominal trauma, the pregnant patient may suffer premature separation of the placenta from the uterine wall, premature labor, abortion, uterine rupture, and possibly, fetal death. The presence of vaginal bleeding or a tender abdomen in a pregnancy patient should increase your suspicion of serious injury. Fetal death may result from death of the mother, separation of the placenta from the uterine wall, maternal shock, uterine rupture, or fetal head injury. Any pregnant patient who has suffered trauma should be immediately transported to the emergency department and evaluated by a physician.

*When spinal injury is suspected, the pregnant woman should be immobilized and transported in the supine position. To prevent compression of the vena cava, carefully tilt the long board 10 to 15 degrees to the left.*

**Potential High Risk Deliveries**

**Multiple Births**

Multiple births are fairly rare. Usually the mother knows, or at least suspects, the presence of more than one fetus. Multiple births should also be suspected if the mother’s abdomen remains large after the delivery of one baby. In twin births, labor often begins earlier than expected, and the infants are generally smaller than babies born singly. Usually, one twin presents vertex and the other breech. There may be one or two placentas.

When delivery of multiple births is imminent:
- Check for, and identify the presenting part, IF the membranes have ruptured.
- If the membranes have NOT ruptured, do NOT check for the presenting part. It is best to maintain intact membranes until the cervix is dilated. Vaginal examination or any procedure that might contribute to premature rupture of membranes should be avoided.
- NOTE: Prolapsed cord is more common with multiple gestations after membranes have ruptured. If a prolapsed cord is noted, treat as outlined in Prolapsed Cord section of this module.
- Request additional EMS personnel as early as possible in order to treat mother and infants.
- Manage each baby in the same manner as for a single delivery.
- After delivery of the first baby, clamp and cut the cord immediately to prevent hemorrhage to each subsequent baby.
- NOTE: Birth of the second baby is often delayed, so if there is no indication that the second birth is imminent, load and go.
- If possible, transport to a facility capable of operative obstetrics.
- If delivery of second infant begins en route, the ambulance should be pulled over to the side of the road for delivery.
- Note times of birth for each baby.
- Clearly label, identify each baby.
- Notify receiving facility while en route.

**Premature Births**

Premature babies are those who are born prior to 37 weeks gestation or weighing less than 2.5 kilograms (5.5 pounds). Each baby should be managed in the same manner as for a term delivery. Be aware that premature babies are particularly susceptible to heat loss and heat loss complications. Pay particular attention to keep the baby warm and prevent loss of body heat.

- Wrap the baby in warm, dry blankets
- Wrap the bundled baby in tin foil or a survival blanket
- Administer oxygen via non-rebreath mask hung above the baby’s head
- Initiate neonatal resuscitation, if necessary
- Monitor and transport to the nearest appropriate health care facility
- Notify receiving facility while en route
Pathophysiology of Labour and Delivery

The delivery of the fetus is the culmination of pregnancy. The process by which delivery occurs is called labor. Labor is generally divided into three stages:

- **First Stage.** The first stage of labor begins with the onset of uterine contractions and ends with complete dilation of the cervix. It lasts approximately 8 hours in nulliparous (a woman who has never borne children) women and 5 hours in multiparous (a woman who has given birth to more than once) women. Contractions may be irregular at first. Later in the first stage, the contractions increase in intensity, while the intervals between contractions shorten.

- **Second Stage.** The second stage of labor begins with complete dilation of the cervix and ends with the delivery of the fetus. In the nulliparous patient, the second stage lasts approximately 50 minutes; in the multiparous patient, it lasts approximately 20 minutes. Contractions are strong, and each one may last 2 or 3 minutes. Often, the patient feels pain in her lower back, as the fetus descends into the pelvis. The urge to push or “bear down” usually begins in the second stage. The membranes usually rupture at this time, if they have not ruptured previously.

- **Third Stage.** The third stage of labor begins with delivery of the fetus and ends with the delivery of the placenta. Delivery of the placenta usually occurs within 30 minutes after birth.

As discussed earlier, labor is painful. The pain usually begins in the abdomen and for some women, begins in the back. Later, as the fetus moves farther down into the pelvis, the pain may extend to the back. The contractions are regular and generally increase in frequency and intensity. The total length of labor averages 6-12 hours, with a great deal of individual variation.

The uterus and cervix must undergo several changes to facilitate delivery of the fetus. First, the cervix must efface. Effacement is the thinning and shortening of the cervix. Early in pregnancy the cervix is quite thick and long, but after complete effacement it is paper thin. Effacement usually begins several days before active labor ensues. Second, the cervix must dilate. Dilation is the progressive stretching of the cervical opening. The cervix dilates from its closed position to 10 cm, which is considered complete dilation.
When dilation and effacement are complete, the baby’s head moves down into the vagina. Late in the second stage of labor, the head can be seen at the opening of the vagina during a contraction. This is called crowning.

The part of the baby that is born first is termed the presenting part. In the majority of cases, this is the head. Occasionally, the buttocks or other parts present first. In the field, the presenting part of the baby cannot usually be determined until crowning has occurred, since vaginal examinations should NOT be performed.

**Management of a Patient in Labor**

Probably one of the most important decisions you must make with a patient in labour is whether to attempt to deliver the infant at the scene or transport the patient to the hospital. There are several factors to take into consideration when making this decision. They include the patient’s number of previous pregnancies, the length of labor during previous pregnancies, and the frequency of contractions.

**Delivery is Imminent**

The following signs and symptoms indicate that delivery is imminent:

- Contraction are less than 2-3 minutes apart. Intervals are measured from the beginning of one contraction to the beginning of the next. If contractions are more than 5 minutes apart, there is generally time to transport the mother to a receiving hospital.
- The mother has an urge to “push” or bear down or has a sensation of needing a bowel movement.
- There is a large amount of bloody show.
- Perineum is bulging or crowning is evident.
- Patient has had one or more normal deliveries.
- The mother believes that delivery is imminent.

If any of these signs are present, the EMS crew should request a second ambulance and prepare for delivery. In such cases, the infant should be delivered at the scene or in the ambulance. With the exception of cord presentation (described later in this module), the paramedic should not delay delivery.

However, certain factors should prompt immediate transport, despite the threat of imminent delivery. These include:

- Prolonged rupture of membranes, since prolonged time between rupture and delivery often leads to fetal &/or maternal infection
- Abnormal presentation, such as breech or transverse
- Fetal distress, as evidenced by fetal bradycardia
- Meconium staining (the presence of meconium indicates the fetus has had a bowel movement in utero).
If contractions are more than 5 minutes apart, AND there is no urge to “push”, “bear down” or “have a bowel movement”, AND crowning is not evident:

- Initiate load and go
- Position the patient on her left side facing the attending EMS personnel
- Prepare to assist with the delivery if the patient’s status changes.

For patients with contractions less than 5 minutes apart, but no other sign of imminent delivery, transport may be initiated, but there is a risk that delivery will occur en route. Consider the following:

- Transport time to the receiving facility (short transport time to hospital would favor transport of patient)
- Road and weather conditions
- Time to available backup
- NOTE: EMS personnel may contact physician on-line control medical control (if available) for assistance or direction

**Normal Delivery**

If delivery is imminent, equipment must be quickly prepared. Set up a delivery area. This should be out of public view, such as in a bedroom or in the back of the ambulance. Administer oxygen to the mother. The patient should be placed on her back and, if time permits, draped. Coach the mother to breathe deeply between contractions and to push with contractions. In most cases, the paramedic crew only assists in the natural events of childbirth. The primary responsibilities of the EMS crew are to prevent an uncontrolled delivery and protect the infant from cold and stress after birth. The following are steps to be taken in assisting the mother with a normal delivery:

- EMS crew should wash hands and arms thoroughly and put on isolation gown and sterile gloves.
- Position the mother semi-fowler on a flat, sturdy surface with her knees bent and legs apart and prepare her for delivery. Remove any constrictive clothing from the mother, and drape her.
- Prepare equipment and obstetrical kit for use during and after delivery, using sterile technique.
- Allow delivery to progress spontaneously.
- When crowning occurs, apply gentle palm pressure with one hand, to the infant’s head to prevent an explosive delivery and tearing of the perineum. Place the other hand just below the vaginal opening, with fingers at the perineum. If membranes are still intact, tear the sac with finger pressure to allow escape of amniotic fluid.
- Suction the infant’s mouth and nose with a bulb syringe to clear the airway as soon as the head is clear of the birth canal.
Support the head and body as delivery proceeds.
DO NOT PULL ON THE BABY!
To minimize the chances of tears in the birth canal, attempt to have the head delivered between contractions by asking the mother to take short, quick breaths (pant)
Reassure the mother continuously, keeping her informed of the progress
Instruct the mother to push with contractions and mouth breathe slowly
During the delivery process, check the position of the cord and ensure that the cord is not around the baby’s head or neck
If the cord is around the neck, treat as outlined in “Abnormal Deliveries- Umbilical Cord Around the Neck”

When the baby is delivered:

- Place baby in drainage position.
- Suction baby’s airway, mouth then nose, with a bulb syringe.
- Keep baby warm and dry.
- Stimulate crying by gently tapping soles of feet. If no spontaneous cry within 1 minute, suction again and begin resuscitating the newborn as outlined in “Resuscitation of the Newborn (Birth to 6 weeks)”.
- Position baby face down with head lowered to facilitate drainage.
- Clamp or tie umbilical cord in two places (do not wait for cord to stop pulsating). First, clamp or tie the cord approximately 18 centimeters (7 inches) from the baby. Next, clamp or tie the cord approximately 25 centimeters (10 inches) from the baby.
- Ensure clamps or ties are secure, and then cut the cord between the clamps or ties.
- Check the cord attached to the baby for bleeding and if bleeding continues, attach a second clamp or tie proximal to the first clamp. Reassess cord for bleeding.
- Assess the baby by the APGAR scoring system at 1 minute and at 5 minutes after birth and record the information.

Birth of the baby, followed (usually within a few minutes) by the delivery of the placenta.

Graphics found on page 506, Emergency Care & Transportation of the Sick & Injured, 7th edition

APGAR Scoring System
The APGAR Score

As soon as possible, the neonate should be assigned an APGAR score. Ideally, this should be done at 1 and 5 minutes after birth. However, if the neonate is not breathing, DO NOT withhold resuscitation until determining the APGAR score.

The APGAR scoring system helps to differentiate those neonates who need only routine care from those who need greater assistance. The system also predicts long-term survival. It was developed in 1952 by Dr. Virginia Apgar, an anesthesiologist. The parameters for APGAR scoring include Appearance, Pulse rate, Grimace, Activity, and Respiratory effort. A score of 0, 1, or 2 is given for each parameter. The minimum total score is 0 and the maximum is 10. A score of 7-10 indicates an active and vigorous neonate that requires only routine care. A score of 4-6 indicates a moderately depressed neonate that requires oxygenation and stimulation. Severely depressed neonates, those with APGAR scores of less than 4, require immediate resuscitation. By repeating the APGAR score at 1 and 5 minutes, it is possible to determine whether intervention has caused a change in the neonate’s status.

As soon as the entire infant is born, wrap it in a towel, and place it on one side, with the head slightly lower than the rest of its body. Wrap the baby so that only the face is exposed, making sure that the top of the head is covered. Also, make sure that the baby’s neck is in a neutral position so that the airway remains open. Newborn babies are very sensitive to cold, so if it is at all possible, you should keep the blanket warm before you use it. Use a sterile gauze pad to wipe the infant’s mouth, and once again, suction the mouth and nose. Suctioning the nose is particularly important, since babies breathe through their noses. If you prefer, you can cradle the infant in your arm while doing this, but always keep the head slightly downward to prevent aspiration. After suctioning, keep the infant at the same level as the mother’s vagina until the umbilical cord is cut. If the infant is higher than the vagina, blood will be siphoned from the infant through the umbilical cord back into the placenta.
A newborn’s body temperature can drop very quickly, so dry and wrap the infant as soon as possible. Only then will you clamp the umbilical cord.

See **cutting the umbilical cord** in the Normal Delivery section of this module.

Remember, the umbilical cord is fragile; if handled too roughly; it could be torn from the infant’s abdomen, resulting in a fatal hemorrhage. Once the clamps are in place, there is no need to rush.

Post delivery care of the umbilical cord stump is important, as infection is easily transmitted through the cord to the baby. Do not use ordinary string or twine, which will cut through the soft, fragile tissues of the cord. Do not remove either clamp. The part of the cord that is attached to the mother will be delivered when the placenta delivers.

By now, the infant should be pink and breathing on its own. Give the infant, wrapped in a warm blanket, to your partner; he or she can monitor the infant and complete its initial care. Record the time of delivery. If the mother is alert and in stable condition, you may give the infant to her and she may want to begin breastfeeding at this time. You need to turn your attention to the mother and the delivery of the placenta.

**NOTE:** if baby is in cardiorespiratory distress at any time after birth, neonatal resuscitation should be initiated based on the Neonatal Resuscitation section in this module.

If placenta delivers spontaneously:

- Do not pull on cord
- Allow placenta to deliver spontaneously
- Place placenta in container and transport it, with baby and mother, to hospital
- Clean blood from mother after normal delivery of placenta

If placenta does not deliver spontaneously:

- Do not pull on cord
- Initiate transport
- Do not delay transport waiting for delivery of placenta

Post-partum bleeding:

- Gently massage uterine fundus on mother’s lower abdomen, using firm, even pressure.
- Assess that fundus has become firm, if it remains soft, massage until firm (ensure proper, gentle technique is used when massaging fundus).
- Assist mother to nurse infant and explain that doing so will help control bleeding.
- It is typical to have some bleeding after placental separation, however, blood loss greater than 500ml or clinical evidence of shock, is considered significant and indicates load and go.

EMS personnel trained and certified to treat postpartum hemorrhage with oxytocin may do so as outlined in “Pharmacological Agent Oxytocin” (page 40)

Post-Delivery Care:

- Place a sterile pad over the vaginal opening.
- Place mother’s legs together to assist in controlling bleeding.
- Transport mother and baby to nearest appropriate health care facility.
- Monitor mother and baby en route.
- Additional EMS personnel should be employed so enough personnel are present to assess and treat both mother and infant(s).
- Notify receiving facility of status of mother and baby.

**Abnormal Deliveries**

**Prolapsed Cord**

A prolapsed cord occurs when the umbilical cord is the first part to be delivered or is protruding from the vagina and is compressed between the fetus and the bony pelvis, shutting off fetal circulation. This tends to occur most frequently in abnormal presentations, with multiple or premature births, or in conjunction with premature rupture of the membranes. It is a serious emergency, and fetal death will occur quickly without prompt intervention.

[Graphic found on page 388 of The Basic EMT, 2nd edition]

**Management of Prolapsed Cord**

If the umbilical cord is seen in the vagina:
Initiate load and go.
Administer high flow oxygen.
Position mother in the knee-chest or Trendelenburg position, with hips elevated and the head low.
Insert a gloved hand into the vagina and gently push the baby’s presenting part (head) up and away from the cord. This reduces pressure on the cord and allows blood flow through the cord to resume. When performing this procedure, ensure the hand does not compress the cord.
Keep the prolapsed cord warm and moist by placing it inside the vagina, if possible.
If IMMEDIATELY available, have additional personnel brought along in the ambulance.
Transport to the nearest health care facility capable of providing operative obstetrics, if available.
Notify receiving facility of mother’s and baby’s status while en route.
Report all information to the staff at the receiving facility, and document on the patient care report.
Do not remove hand until relieved by health care facility staff.

**Breech**

Most babies present head first, or vertex. However, approximately 3% of deliveries are breech presentations, in which the presenting part is the feet or the buttocks. Breech presentations are more common in premature infants and in mothers with uterine abnormalities. Such deliveries usually carry an increased risk for fetal trauma, anoxia, and cord prolapse.

Because cesarean section is often required, delivery of the breech presentation is best accomplished in the hospital. However, if field delivery is unavoidable, then the following maneuvers are recommended:

- If the membranes have ruptured, check for and identify the presenting part.
- If the membranes have not ruptured, do not check for the presenting part.

Vaginal examination or any procedure that might contribute to premature rupture of the membranes should be avoided. NOTE: Umbilical cord prolapse is more common with breech presentations after membranes have ruptured. If umbilical cord prolapse is noted, treat as noted in the Prolapsed Cord section of this module.

Graphic found on page 389 of The Basic EMT, 2nd edition.

*Types of breech presentations. Illustrated here (L to R): Frank, Complete, and Footling presentations.*
Management of Breech

Optimal results occur when the following principles are adhered to:

- DO NOT interfere with the delivery until the body has passed the vaginal opening.
- Have the mother bear down hard during contractions and rest between contractions.
- Maintain suprapubic pressure during descent of the baby to aid delivery and maintain head in flexed position.

If birth is NOT imminent:

- Initiate load and go.
- Position the mother on her left side, if tolerated.
- If immediately available, have additional personnel brought along in the ambulance.
- Transport to the nearest facility capable of operative obstetrics (if available).
- Notify receiving health care facility of the baby’s and mother’s status while en route.
- Report all information to the staff at the receiving facility, and document on the patient care report.

If labour resumes while en route and birth is imminent, the ambulance should be pulled over to the side of the road for delivery. EMS crew should request a second ambulance. Position the mother as per the “Breech Birth- If Birth is Imminent” section, that follows in this module and deliver the infant using this procedure. Notify the receiving facility of the change in the status of the delivery.

If birth is imminent:

- Prepare the mother by positioning her on a suitable raised surface which is high enough to allow the baby to hang freely and not rest on the ground.
- Another member of the EMS team should be positioned so they can support baby and assist if delivery is rapid.
- Administer high concentration oxygen.
- Without interference, or lifting the baby, allow the breech to deliver until the umbilicus has passed the vaginal opening.
- Premature traction on the baby MUST BE AVOIDED!
- When possible, identify and attempt to loosen the umbilical cord without excessive pulling on it, or lifting of the baby’s body, as this will prevent traction on the umbilical cord.
- Without interference, allow the spontaneous delivery of the rest of the body.
- Cover the baby with a warm towel and support the body.
- Maintain suprapubic pressure.
- When the hairline at the back of the baby’s neck (nape) appears at the vaginal opening, place the fingers of one hand on the baby’s head, to control the speed of the delivery.
Use the fingers of the other hand to retract vaginal tissue away from the baby’s mouth and nose to permit the baby to breathe.

If the baby delivers spontaneously, the assistant should lift the baby onto the mother’s abdomen and initiate post-delivery care.

If the baby’s body delivers spontaneously, but the head does not:

- Lift the baby’s legs up together by grasping the ankles in a locked finger hold.
- Using a smooth motion, gently lift the baby’s legs and body toward the mother’s abdomen with one hand.
- Use the other hand to gently apply firm pressure against the perineum to prevent forceful expulsion of the baby’s head and tearing of the perineum.

If progress of the delivery ceases prior to the appearance of the nape of the neck, initiate load and go:

- If immediately available, have additional personnel brought along in the ambulance.
- Transport to the nearest facility capable of operative obstetrics (if available).
- Notify receiving health care facility of the baby’s and mother’s status while en route.
- Continue to monitor the progress of the delivery en route.
- Report all information to the staff at the receiving facility, and document on the patient care report.

**Limb Presentation**

On very rare occasions, the presenting part of the infant is neither the head, nor the buttocks, but a single arm, leg, or foot. This is called limb presentation. You cannot successfully deliver such a presentation in the field. These infants usually must be surgically. If you are faced with a limb presentation, you must:

- Initiate load and go.
- Administer high flow oxygen.
- Position mother in the knee-chest or Trendelenburg position, with hips elevated and the head low.
- If IMMEDIATELY available, have additional personnel brought along in the ambulance.
- Transport to the nearest health care facility capable of providing operative obstetrics, if available.
- Notify receiving facility of mother’s and baby’s status while en route.
- Monitor the mother en route.
- Report all information to the staff at the receiving facility, and document on the patient care report.
**Umbilical Cord around the Neck**

An umbilical cord wound tightly around the neck could cause the infant to strangle. It must therefore be released from the neck immediately.

**Management of Umbilical Cord around the Neck**

As soon as the head is delivered, feel whether the cord is looped around the head or neck. If the cord is felt:

- Attempt to slip the cord over the baby’s head between contractions.
- If this is unsuccessful, attempt to slip the cord over the presenting shoulder

If these are both unsuccessful:

- Clamp the cord in two places, 5 centimeters (2 inches) apart
- Cut the cord between the clamps, ensuring that the baby is not cut
- Slip the cord from around the baby’s neck
- Deliver the baby
- Check the cord for bleeding. If there is still bleeding, place another clamp on the cord attached to the baby, proximal to the first clamp. Assess the cord again for bleeding.
- Continue with the delivery

Following delivery:

- Assess the mother’s and baby’s vital signs and assess the baby for adequacy of respirations and provide respiratory support, if required.
- Transport mother and baby to the nearest appropriate health care facility.
- Additional EMS personnel should be available to assess and treat both mother and infant.
- Monitor mother and baby en route.
- Notify receiving facility of mother’s and baby’s status while en route.
- Report all information to the staff at the receiving facility, and document on the patient care report.

**Delayed or Abnormally Progressing Delivery**

Where delivery is delayed or not progressing normally (delay may be a sudden cessation in progress) and there are not two strong contractions in five minutes, or the mother displays signs of severe abdominal pain or shock:

- Initiate load and go.
- Provide high concentration oxygen.
- Treat shock, if indicated.
- Position patient on her left side and do not elevate the head.
➢ Prepare for possible delivery en route.
➢ If IMMEDIATELY available, have additional personnel brought along in the ambulance.
➢ Transport to the nearest health care facility capable of providing operative obstetrics, if available.
➢ Notify receiving facility of mother’s and baby’s status while en route.
➢ Report all information to the staff at the receiving facility, and document on the patient care report.

**Meconium**

About 12% of deliveries are complicated by the presence of meconium, a dark green material in the amniotic fluid. Meconium can be thick or thin. If the newborn aspirates thick meconium, serious lung disease and sometimes death can occur. Therefore, if you see meconium in the amniotic fluid or meconium staining, you should continue vigorous suctioning of the infant after delivery.

**Postpartum Complications**

**Postpartum Hemorrhage**

Postpartum hemorrhage is the loss of 500 ml or more of blood in the first 24 hours following delivery. It occurs in approximately 5 percent of deliveries. The most common cause of postpartum hemorrhage is uterine atony, or lack of uterine muscle tone. This tends to happen most frequently in the multigravida and is the most common following multiple births or births of large infants. Uterine atony also occurs after precipitous deliveries (delivery that occurs after less than 3 hours of labor) or long labors. In addition to uterine atony, postpartum hemorrhage can be caused by placenta previa, abruptio placentae, retained placenta parts, clotting disorders in the mother, or vaginal and cervical tears. Occasionally, the uterus fails to return to its normal size during the postpartum period, and postpartum hemorrhage occurs long after the birth.

**Assessment of Postpartum Hemorrhage**

Assessment of the patient with postpartum hemorrhage should focus on the history and the predisposing factors listed above. You must rely heavily on the clinical appearance of the patient and her vital signs. Often the uterus will feel boggy and soft on physical examination. Vaginal bleeding is usually obvious.
Management

- Gently massage the fundus of the uterus with a circular rubbing motion on the mother’s lower abdomen.
- Assess that the uterus has become firm.
- Reassess the fundus every 5 minutes to ensure it remains firm, if the fundus becomes soft (boggy), massage the fundus again until it becomes firm. Ensure proper, gentle technique is used when massaging the uterus. Rough or improper technique could damage the uterus and result in increased bleeding.
- Put the baby to the mother’s breast to nurse.
- Place a sanitary pad or bulky dressings over the vaginal opening.
- Manage bleeding from tears, using direct pressure.
- Place mother’s legs together to assist in controlling bleeding.
- Treat for shock, if indicated.
- Initiate load and go.
- Estimate blood loss.
- Notify receiving facility while en route.
- EMS personnel trained and certified to treat postpartum hemorrhage with oxytocin may do so as outlined in “Pharmacological Agent Oxytocin” (page 40)
- Monitor mother and baby en route.
- Additional EMS personnel should be present to treat mother and baby.
- Notify receiving facility of the status of mother and baby.

**Inverted Uterus**

Inverted uterus is a rare emergency that occurs when the uterus turns inside out after delivery. When uterine inversion occurs, the supporting ligaments and blood vessels supplying blood to the uterus are torn, usually causing profound shock. Uterine inversion usually results from pulling on the umbilical cord while awaiting delivery of the placenta or from attempts to express the placenta when the uterus is relaxed.

Management

If uterine inversion occurs:

- Act quickly.
- Place patient supine.
- Administer oxygen.
- DO NOT attempt to detach the placenta or pull on the cord.
- Initiate one or two large bore IV’s if certified to do so.
- Notify receiving facility while en route.
**Assessment and Management of the Newborn**

Assess the neonate immediately after birth. Ideally, if two paramedics are available, one will attend the mother, while the other attends the neonate.

Obtain vital signs quickly. The neonate’s respiratory rate should average 40-60 breaths per minute. If asphyxia is present, begin resuscitation at once. Next, assess the heart rate. The heart rate is normally 150-180 beats per minute at birth, slowing to 130-140 beats per minute shortly thereafter. A heart rate of less than 100 beats per minute indicates distress and requires emergency intervention. The skin colour should be evaluated as well. Some cyanosis of the extremities is common immediately after birth. However, cyanosis of the central part of the body is abnormal, as is persistent peripheral cyanosis.

**Resuscitation of the Newborn (Birth to 6 weeks)**

Prior to assisting with delivery, all neonatal resuscitation equipment should be prepared and placed for immediate access. If, during delivery, meconium staining is observed in the amniotic fluid and the baby is not fully delivered, EMS personnel should suction the baby’s mouth, pharynx and nose thoroughly until it is clear of meconium. This should be done as soon as the head is delivered and PRIOR to the delivery of the shoulders. Initial suctioning should follow the order: mouth and pharynx, then nose. Suctioning MAY stimulate breathing. Ensure thorough suctioning of the airway as it is vital in avoiding aspiration.

The order of subsequent suctioning of the neonate’s airway is affected by the presence of fluid or secretions in the mouth or nose. If the mouth contains fluid or secretion, the mouth and pharynx should be suctioned first. If the mouth is clear of secretions, the nose should be suctioned first. The mouth, pharynx and nose MUST be suctioned.

**Upon delivery of the baby:**

- Continually reassess, maintaining body heat
- Position the baby on his/her back or side with the neck slightly extended. In order to maintain the correct position and head alignment, a rolled towel can be placed under the shoulders to elevate them 2 to 3 cm (3/4 to 1 inch) off the surface.
- As soon as the baby has been positioned, the mouth, pharynx and nose should be suctioned again.
- After drying and suctioning, tactile stimulation should be provided to the baby by flicking the soles of the baby’s feet and/or rubbing the baby’s back (tactile stimulations should not be provided until after the airway is cleared in the presence of meconium staining.
- Immediately assess the baby’s breathing. If breathing is normal, assess the heart rate by auscultating the apical beat or palpating the umbilical pulse. The initial heart rate should be greater than 100 beats per minute.
If both breathing and heart are normal, assess the colour of the baby. If central cyanosis is present, administer free flow oxygen (5 lpm) by holding oxygen tubing or an infant mask 1 to 2 cm (0.5 inch) from the baby’s nares. Peripheral cyanosis to the extremities is common in most infants during the first few minutes after birth.

If initial assessment reveals apneic or gasping respirations, or an initial heart rate less than 100 beats per minute, ventilation MUST be initiated, using a bag-valve mask with 100% oxygen for 30 seconds (one breath every three seconds). Reassess the breathing and heart rate.

If ventilation does NOT result in adequate chest rise, reapply the mask to the face, reposition the baby’s head. Be sure to avoid hyperextension of the neck. Check for secretions and suction as necessary. Ventilate with the infant’s mouth slightly open.

If the heart rate is greater than 100 beats per minute, after initial ventilation, assess the baby for the presence and adequacy of spontaneous ventilation. If spontaneous breathing is adequate, administer free flow oxygen (5 lpm). If spontaneous ventilation is still inadequate, continue to ventilate the baby with 100% oxygen using a BVM. Continue to reassess respirations and pulse at 60 second intervals.

If the heart rate is less than 60 beats per minute after initial ventilation, load and go. Ventilation should be continued and checked for adequacy. Chest compressions should be started at a rate of 120 per minute (ratio of 3:1). Continue to reassess respirations and pulse at 60 second intervals.

Document initial assessments and any changes in the neonate’s status and all interventions carried out in treatment of the neonate.
Unfortunately, you may find yourself delivering an infant that has died in the mother’s uterus before labour. This will be a true test of your medical, emotional, and social abilities. Grieving parents will be emotionally distraught and perhaps even hostile, requiring all your professionalism and support skills.

The onset of labour may be premature, but labour will progress normally in most cases.

Assessment of Stillborn Infant

If an intrauterine infection has caused the demise, you may note an extremely foul odor. The delivered infant may have skin blisters, skin sloughing, and a dark discoloration, depending on the stage of decomposition. The head will be soft and perhaps grossly deformed.

Do not attempt to resuscitate an obviously dead infant. However, do not confuse such an infant with those who have had a cardiopulmonary arrest as a complication of the birthing process. You must try to resuscitate normal-appearing infants.

Management of Stillborn Infant

- Obtain a history and time frame from delivery if not witnessed by EMS personnel.
- Assess the baby. Complete an initial survey and determine if the infant fulfills the criteria for an obvious death. Assess for presence or absence of a pulse and respirations. Then assess for dependent lividity and rigor mortis. These signs may not be evident in a newborn or may be difficult to assess.
- If the newborn infant does not meet the criteria for an obvious death, resuscitation should be initiated.
- Load and go.
- Document all actions and decisions fully.
- If the infant does not meet the criteria for resuscitation, notify the appropriate authorities.
- Provide emotional and psychological support to the parents.

EMS Personnel and Midwives

Midwives in Manitoba operate under the Midwifery Act and Regulation to the Midwifery and Consequential Amendments Act. To read the “Consequential Amendments Act”,

Resuscitation of the neonate.
you may go to the following link:

EMS personnel may be called to a home birth or health care facility where a midwife is in attendance. When attending a home birth with a midwife present, EMS personnel should obtain the midwife’s name and the midwife’s assistant’s name and record both on the patient care report.

Each region may have additional policies in place for the interaction between midwives and other health care providers. EMS providers should be current with local policies relating to working with midwives.

When planning a delivery attended by a midwife, the College of Midwives of Manitoba recommends that the midwife involved use their “Standard For Planned Out Of Hospital Births” protocol. The midwife is responsible for the home birth and this planning must include:

- Identifying the distance to a health care facility capable of providing operative obstetrics
- Access to telephones and other communication services
- Weather conditions
- Availability of emergency support systems
- Psycho-social support factors

The midwife must also ensure that a backup plan is in place in the event of an emergency. The backup plan must include:

- An adequately trained second birth attendant is present at each home birth
- Making prior contact with the local emergency medical service and the nearest hospital or health care facility capable of dealing with an obstetrical emergency
- Ensuring satisfactory transport service for mother and infant/s can be initiated within 30 minutes
- Ensure a satisfactory means of communication is available

The College of Midwives of Manitoba recommends that the midwife should pre-register the home birth with Emergency Medical Services if the birth is to occur in a location at a distance of at least thirty minutes journey from a hospital with surgical facilities, using a method of transportation ordinarily used for health care purposes in the area or if the mother lives in a location with difficult or obscure access.

The College of Midwives of Manitoba further recommends that the midwife provide written notification of a planned home birth to the appropriate ambulance dispatch office when the mother has reached 37 weeks gestation. The midwife should provide registration of a planned home birth to the appropriate ambulance dispatch office within 48 hours of the scheduled date of birth.

In most instances, the midwife will take the lead role in delivering the baby. EMS personnel will be called to transport the mother and baby to an appropriate health care
facility, should the need arise. If there are complications associated with the delivery, the midwife may request EMS personnel to assist with the delivery and transport the mother and baby to a health care facility. EMS personnel should assist the midwife within the limits of their occupational competencies, level of training, and protocols.

EMS personnel are responsible for providing emergency care for the mother and baby when the care required is beyond the scope of practice of the midwife. This includes, but is not limited to, seizures, cardiac arrest, trauma, and shock.

Under normal circumstances, the midwife must arrange for a second birth attendant to assist in the home delivery. EMS personnel are required to assume care of either the mother or newborn if a second birth attendant is not present or the condition of either mother or baby is compromised.

If transport is required for either or both mother and baby, the appropriate personnel should accompany the most critical patient in the ambulance. The midwife may elect to accompany the most critical patient and assist with treatment en route. If one patient is transported without the midwife in attendance, the EMS personnel should treat as per the appropriate Emergency Treatment Guidelines and Protocols.
Pharmacological Agent Oxytocin

Oxytocin (Pitocin, Syntocin)

Class
- hormone

Mechanism of Action
- increases uterine contractions

Indications
- postpartum hemorrhage after infant and placental delivery

Contraindications
- fetus not yet delivered
- unfavorable fetal position
- hypersensitivity

Adverse Reactions
- hypotension, hypertension, tachycardia, dysrhythmias, angina pectoris
- anxiety, seizures, nausea, vomiting, uterine rupture
- anaphylaxis

Drug Interactions
- other vasopressors may potentiate hypertension

How Supplied
- 10 USP units/1ml ampule (10 U/ml) and prefilled syringe
- 5 USP units/1 ml ampule (5 U/ml) and prefilled syringe

Dosage and Administration
- IM Administration: 3-10 units after delivery of placenta
- IV Administration: mix 50-500 units in 1000 ml of D5W, NS or LR
  - infuse at 20-40 milliunits/min (12-24 ml/hours), titrated to severity of bleeding and uterine response

Duration of Action
- onset: IM: 3-5 minutes; IV: immediate
- peak effect: variable
- duration: IM: 30-60 minutes; IV: 20 minutes after infusion discontinued

Special Considerations
- pregnancy safety: not applicable
- monitor vital signs, including fetal heart rate and uterine tone, closely
References

Emergency Care and Transportation of the Sick and Injured, Seventh Edition, Bruce D. Browner, MD, FAAOS; Lenworth M. Jacobs, MD, MPH, FACS; Andrew N. Pollak, MD, EMT-P, FAAOS, AAOS, Jones and Bartlett Publishers 1999

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The Basic EMT: Comprehensive Prehospital Patient Care, Second Edition, Norman E. McSwain, Jr., and James L. Paturas, Mosby Inc. c 2001