Chapter 46

Obstetrics

Learning Objectives

• Describe the basic anatomy and physiology of the female reproductive system.
• Outline fetal development from ovulation through birth.
• Explain normal maternal physiological changes that occur during pregnancy and how they influence prehospital patient care and transportation.
Learning Objectives

- Describe appropriate information to be elicited during the obstetrical patient’s history.
- Describe specific techniques for assessment of the pregnant patient.
- Describe the general prehospital care of the pregnant patient.
- Discuss the special implications of trauma in pregnancy.

Learning Objectives

- Outline principles of care for a pregnant patient in cardiac arrest or peri-arrest.
- Recognize and begin treatment for complications of pregnancy such as hyperemesis gravidarum, Rh sensitization, diabetes mellitus, and infection.
- Describe the assessment and management of patients with preeclampsia and eclampsia.

Learning Objectives

- Explain the pathophysiology, signs and symptoms, and management of vaginal bleeding in pregnancy.
- Outline the physiological changes that occur during the stages of labor.
- Describe the role of the paramedic during normal labor and delivery.
Learning Objectives

• Compute an Apgar score.
• Describe assessment and management of postpartum hemorrhage.
• Discuss the identification, implications, and prehospital management of complicated deliveries.

Female Reproductive Anatomy

• Comprised of external and internal anatomic structures
  – Allow for pregnancy
• External genitalia
  – Labium minora
  – Labium majora
  – Vagina
  – Clitoris

Female Reproductive Anatomy

• Internal organs; lie within pelvis
  – Uterus
  – Ovaries
  – Uterine (or fallopian) tubes
  – Cervix
• Under control of endocrine system and hormones
Female Reproductive Anatomy

• For women of childbearing age
  – Cycle usually a monthly event
    • Begins with menstruation (shedding of the endometrium or uterine lining)
    • Ends with pregnancy OR
    • Absence of fertilization, another menstrual cycle

Normal Events in Pregnancy

• Fertilization normally occurs in fallopian tube
  – Head of sperm penetrates mature ovum
  – Nuclei of sperm and ovum fuse
  – Newly fertilized ovum becomes zygote
  – Zygote undergoes repeated cell divisions as it passes down tube

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Normal Events in Pregnancy

- Fertilization normally occurs in fallopian tube
  - After few days of cell division, ball of cells called morula formed
    - Cell differentiation between inner layer cells (blastocyst cells) and outer layer cells (trophoblast cells)
  - Trophoblast cells attach to endometrium lining of uterus
  - Implantation begins within 7 days after fertilization
    - Completed when trophoblast make contact with maternal circulation
    - About day 12

Normal Events in Pregnancy

- Fertilization normally occurs in fallopian tube
  - Trophoblast go on to make various life support systems for embryo
    - Placenta
    - Amniotic sac
    - Umbilical cord
  - Blastocyst cells develop into embryo itself
Specialized Structures of Pregnancy

- Provide nutrients for developing embryo
- Part of fetal circulation
  - Placenta
  - Umbilical cord
  - Amniotic sac and its fluid

Placenta

- Disk-like organ composed of interlocking fetal and maternal tissues
- Trophoblast cells continue to develop and form placenta for about 14 days after ovulation
- Organ of exchange between mother and fetus

Placenta

- Responsible for five functions
  - Transfer of gases
    - Diffusion of oxygen and carbon dioxide through placental membrane (similar to diffusion that occurs in lungs)
    - Dissolved oxygen in maternal blood passes through placenta into fetal blood
    - Takes place as result of increase in partial pressure of oxygen in mother’s blood compared to fetus
    - Fetal carbon dioxide pressure ($P_{CO_2}$) accumulates, a low pressure gradient of carbon dioxide develops across placental membrane
    - Carbon dioxide diffuses from fetal blood to maternal blood
Placenta

- Responsible for five functions
  - Transport of nutrients
    - Other metabolic substrates that fetus needs diffuse into blood in same manner as oxygen
    - Glucose in fetal blood about 20 to 30 percent lower than maternal blood
    - Results in rapid diffusion of glucose to fetus
    - Transports other substrates; fatty acids, potassium, sodium, and chloride
    - Actively absorbs some nutrients from maternal blood

Placenta

- Responsible for five functions
  - Excretion of wastes
    - Diffuse from fetal blood into maternal blood
    - Examples are urea, uric acid, and creatinine
    - Excreted with waste products of mother
    - Transfer from fetal circulation to maternal circulation moving osmotically from higher concentration to lower concentration; same manner as carbon dioxide

Placenta

- Responsible for five functions
  - Hormone production
    - Placenta becomes temporary endocrine gland
    - Secretes estrogen and progesterone
    - By third month of development, corpus luteum on the ovary no longer is needed to sustain pregnancy
    - Estrogen, progesterone, and other hormones maintain uterine lining, prevent occurrence of menses
    - Stimulate changes in pregnant woman's breasts, vagina, cervix, and pelvis
Placenta

- Responsible for five functions
  - Formation of barrier
    - Placenta forms barrier against some harmful substances in mother’s circulation (e.g., bacteria and certain drugs)
  - Only partially selective and does not fully protect fetus
  - Certain medications easily cross placenta
    - Steroids
    - Narcotics
    - Anesthetics
    - Some antibiotics

What happens to diffusion of gases if the mother becomes hypoxic?

Fetal Circulation

- Umbilical cord connects umbilicus with placenta
- The average umbilical cord is about 55 cm long with diameter of 1 to 2 cm
Fetal Circulation

• Blood flows from fetus to placenta through two umbilical arteries in cord
  – Arteries carry deoxygenated blood
  – Oxygenated blood returns to fetus through umbilical vein
• Independent of and separated from maternal circulation

Fetal Circulation

• Anatomic structures unique to fetal circulation
  – Ductus venosus
    • Continuation of umbilical cord
    • Serves as shunt to allow most blood returning from placenta to bypass immature liver
    • Allows blood to empty directly into inferior vena cava
    • Lungs remain collapsed until birth
  – Foramen ovale
    • Shunt from right atrium into left

Fetal Circulation

• Anatomic structures unique to fetal circulation
  – Ductus arteriosus
    • Connects pulmonary artery to aorta
    • Well-oxygenated blood from placenta enters left side of heart directly from right side, bypassing lungs
    • Left ventricle pumps oxygenated blood mainly into vessels of head and forelimbs
    • Blood entering right atrium from superior vena cava progresses downward through tricuspid valve into right ventricle
Fetal Circulation

- Anatomic structures unique to fetal circulation
  - Ductus arteriosus
    - Most of this blood is deoxygenated blood from head of fetus
    - Blood is pumped by right ventricle into pulmonary artery
    - Deoxygenated blood passes from pulmonary artery, through ductus arteriosus, into descending aorta, through two umbilical arteries, and into placenta for oxygenation
- At birth, various arteriovenous shunts close in most infants

Amniotic Sac and Fluid

- Completely surrounds embryo
- Contains fluid primarily produced by fetal urine and placenta
- Fluid is continually produced
Amniotic Sac and Fluid

- Amounts to about 175 to 225 mL by 15th week of pregnancy and about 1 L at birth
- Amniotic sac may rupture before or at time of delivery
- May be large loss of fluid (gross rupture) or small trickle (leaking of membranes)

Fetal Growth and Development

- Developing ovum is called an embryo during first 8 weeks of pregnancy
- Thereafter and until birth, called a fetus
- Period during which fetus grows and develops within uterus is known as gestation
  - Averages 40 weeks from time of fertilization to delivery
  - Divided into trimesters

Fetal Growth and Development

- Calculated delivery date referred to as estimated date of confinement (EDC)
- Rapid fetal growth and development characterize period of gestation
Infant Adaptations After Birth

- Infant loses placental connection with mother at birth
- Fetal circulation changes almost immediately to permit adequate blood flow through lungs
- Newborn usually begins to breathe spontaneously at birth

Infant Adaptations After Birth

- Occurs when chest exits birth canal or with some external stimulation
- Surface tension of viscid fluid that fills alveoli holds walls of alveoli together
- First breaths need to be powerful enough to open alveoli and allow subsequent respirations to occur with less effort
Infant Adaptations After Birth

- Ductus venosus, ductus arteriosus, and foramen ovale allow blood flow to bypass immature liver and lungs of the developing fetus
- Blood flow through placenta ceases at birth, resultant increase in systemic vascular resistance and increase in pressure in aorta, left ventricle, and left atrium

Infant Adaptations After Birth

- Pulmonary vascular resistance decreases greatly because of lung expansion
  - Reduces pulmonary arterial, right ventricular, and right atrial pressures
  - Arteriovenous shunts close normally within few hours after birth
  - Eventually close completely and covered with growth of fibrous tissue

Do fetal heart tones sound normal if you auscultate them immediately after birth?
Pregnancy Terminology (GTPAL)

• GTPAL stands for Gravida, Term, Preterm, Abortions, and Living
  – Gravida: number of times woman has been pregnant, including present
  – Term: number of term deliveries
  – Preterm: number of preterm deliveries
  – Abortions: number of spontaneous or induced abortions
  – Living: number of living children

Pregnancy Terminology (GTPAL)

• Patients are described by gravid and parous states
  – Para refers to number of infants born after 20 weeks gestation
  – Example: Woman who is pregnant for first time is gravida 1, para 0
• Woman who has had two or more deliveries is multipara
• Woman who has never delivered a child is nullipara

Patient Assessment

• Must be familiar with normal physiological changes that occur in pregnant woman
• Help paramedic to assess a pregnant patient
Maternal Changes During Pregnancy

• Changes affect
  – Genital tract
  – Breasts
  – Gastrointestinal system
  – Cardiovascular system
  – Respiratory system
  – Metabolism

Genital Tract

• Uterus
  – Size increases from 70 g (nongravid) to 1000 g by term
  – Triples in size and weight by 8 weeks of pregnancy
  – Occupies entire pelvic cavity
    • May be palpated suprapubically by 12 weeks of pregnancy
  – Becomes abdominal organ and top of the uterus (fundus) reaches level of umbilicus by 20 weeks gestation
  – Fundus descends a little when fetus descends into pelvis.
    • Occurs close to term, between 38 and 40 weeks gestation

Genital Tract

• Cervix
  – Increased uterine blood volume and lymphatic fluid cause pelvic congestion and edema
    • Results in softening and bluish discoloration of cervix (Chadwick’s sign)
Genital Tract

- Vagina
  - Develops a violet color from increased vascularity
  - Mucosa increases in thickness and vaginal secretions increase
  - PH of vaginal secretions decrease to about 3.5 because of increased production of lactic acid from glycogen in vaginal epithelium
    - Acidic pH reduces the growth of some pathogens

Genital Tract

- Bladder
  - Early in first trimester, frequency of urination occurs mainly from pressure of expanding uterus on bladder
  - Physiologic increases in blood volume and cardiac output of mother may also play role
  - Frequency disappears when uterus rises out of pelvis
  - Returns once again when fetal head engages in pelvis near term

Genital Tract

- Breasts
  - Become tender in early weeks of pregnancy
  - Breasts increase in size as result of hypertrophy of mammary alveoli by second month of pregnancy
  - Nipples become larger, more deeply pigmented, and usually more erectile early in pregnancy
  - Breast glands proliferate, nipples may secrete a clear fluid by 10th week of pregnancy if stimulated
Gastrointestinal System

- Morning sickness and nausea may occur at any time
  - Usually begin by 6th and abate by 14th week
  - Cause is unknown but may be related to high serum levels of chorionic gonadotropin in early pregnancy
- Enlarging uterus displaces the mother's stomach and intestines upward and laterally
  - May cause indigestion and gastroesophageal reflux (GERD)
  - May increase risk for aspiration in unconscious patients

Gastrointestinal System

- Liver is displaced backward, upward, and to right
- Tone and motility of gastrointestinal tract decrease
  - Leading to prolonged gastric emptying and relaxation of pyloric sphincter
  - Heartburn and constipation are common

What problems are associated with these GI changes for the unconscious pregnant woman who has sustained trauma?
Cardiovascular System

• Heart
  – Elevation of diaphragm displaces heart to left and upward
  • Flat or negative T waves may be present in lead III on electrocardiogram
  – Cardiac output increases by 30 percent by 34th week
  – Pulse rate may increase 15 to 20 beats/min above baseline late in third trimester
  – Pulmonic systolic and apical systolic murmurs are common
  • Lowered blood viscosity and increased flow lead to turbulence in great vessels

Cardiovascular System

• Circulation
  • Total blood volume increases by 30 percent
    • Plasma volume increases by 50 percent
    • Hemodilutional anemia is possible beginning at 28 weeks
  – Blood pressure decreases 10 to 15 mm Hg during second trimester
    • Reduction in peripheral resistance
    • Gradually increases to prepregnancy levels toward term

Cardiovascular System

• Circulation
  – Enlarged uterus interferes with venous return from legs
    • Resulting in peripheral edema in ankles
    • Hemorrhoids and varicose veins may be present
  – Supine position may cause uterus to compress inferior vena cava
    • Can produce decreased cardiac filling and decreased cardiac output (supine hypotension syndrome)
    • Patient may become faint and hypotensive while lying on back after first or second trimester
Cardiovascular System

- Blood
  - Leukocyte count increases
  - Fibrinogen levels increase by 50 percent because of influence of estrogen and progesterone

Respiratory System

- Tidal volume and minute ventilation increase by 30 to 40 percent in late pregnancy
- Functional residual capacity decreases by about 25 percent
- Respiratory rate may be normal or may increase because of elevation of diaphragm by enlarged uterus

Respiratory System

- Pco2 normally decreases because of an increased respiratory rate
  - Changes from 40 torr to 30 torr to provide a gradient for fetal carbon dioxide
  - May cause dizziness and sensation of shortness of breath
Metabolism

- Mother normally will experience a weight gain of 15 to 30 pounds
- Increased water retention produces increase in hydrostatic pressure within capillaries
  - Favors filtration from vascular bed and can result in edema
- Metabolic rate and caloric demand (especially for protein) increase

Metabolism

- Glucose escapes into urine because of increased glomerular filtration
- Maternal gestational diabetes mellitus (GMD) may result from impaired ability to metabolize carbohydrates
- Fetal demands for calcium and iron may deplete maternal stores if patient does not supplement through diet
History

• First gather details about chief complaint
  – Complaint may not be related to pregnancy
• If possible, solicit information about onset of signs and symptoms and examine patient in privacy
• After ruling out life-threatening illness or injury, interview patient to obtain relevant information

History

• History for pregnant patient must incorporate following
  – Obstetrical history
    • Length of gestation
    • Parity and gravidity
    • Previous cesarean delivery
    • Maternal lifestyle (alcohol, drug use, smoking history)
    • Infectious disease status
    • History of previous gynecological or obstetrical complications (eclampsia, GDM, premature labor, ectopic pregnancy)

History

• History for pregnant patient must incorporate following
  – Presence of pain
    • Onset (gradual or sudden)
    • Character
    • Duration and evolution over time
    • Location and radiation
History

• History for pregnant patient must incorporate following
  – Presence, quantity, and character of vaginal bleeding
  – Presence of abnormal vaginal discharge
  – Presence of “show” or rupture of membranes
    • Expulsion of mucous plug in early labor

History

• History for pregnant patient must incorporate following
  – Current general health and prenatal care
    • None, physician, nurse, midwife
  – Allergies and medications taken
    • Especially use of narcotics in past 4 hours
  – Maternal urge to bear down or sensation of imminent bowel movement, indicating imminent delivery

Physical Examination

• Patient’s chief complaint determines extent of examination
• Goal identify acute life-threatening conditions rapidly
  – Identify imminent delivery
  – If delivery is near, paramedic must take proper management steps
Physical Examination

• Assess general appearance and skin color
  – If very pale, hemorrhage should be suspected
  – Sunken cheeks, cracked lips, or hollow eyes with history of vomiting indicates dehydration

Physical Examination

• Vital signs should be monitored often
  – Orthostatic vital signs may indicate early presence of significant bleeding or fluid loss
  – Recall normal physiological changes in pregnant patient can produce variations
    • Mild tachycardia
    • Slight fall in systolic and diastolic blood pressures
    • Increase in respiratory rate

Physical Examination

• Abdomen should be examined for scars and gross deformities
  – Gentle palpation may reveal presence of masses, enlarged organs, intestinal distention, or distended bladder
    • May be hard to recognize in late pregnancy
Physical Examination

- During exam, may be possible to discern peritoneal irritation
  - Diagnosed by presence of tenderness, guarding or rebound tenderness
- If obviously pregnant, may need to assess uterine size and monitor fetus

Evaluation of Uterine Size

- Uterine contour usually irregular between 8 and 10 weeks gestation
- Early enlargement may not be symmetrical
  - May be deviated to one side
- Located above symphysis pubis at 12 to 16 weeks gestation
- At level of umbilicus at 20 weeks and near xiphoid process at term
Fetal Monitoring

• Fetal heart sounds
  – Can be auscultated beginning at 12 weeks gestation
  – May be difficult to hear in noisy environment
  – Can be auscultated by use of stethoscope, fetoscope, or Doppler probe
  – Purpose of checking heart tones is to assess fetal well-being
  – Monitor fetal heart rate and maternal vital signs every 5 to 10 minutes

• When auscultating fetal heart rate (FHR), position high-intensity diaphragm of stethoscope (bell of fetoscope or microphone of Doppler probe) firmly on mother’s abdominal wall
  – If more than 20 weeks gestation, palpate for fetal back (defined by structure that is firm and hard vs. small body parts)
Fetal Monitoring

- Diaphragm is then moved in circular pattern 6 to 8 inches in diameter around woman’s umbilicus until fetal heart tones can be heard
  - If using Doppler, should be placed below umbilicus on side of fetal back
- Once paramedic locates tones, fetal heart rate is measured in bpm
  - Difficult to hear, so do not spend too much time trying to find, particularly in patient who is seriously sick, in active labor, or otherwise unstable

Fetal Monitoring

- Normal fetal heart rate = 120 to 160 bpm
  - Fetal heart rate that remains over 160 (fetal tachycardia) or under 110 bpm (fetal bradycardia) for 60+ seconds may be early sign of fetal distress
  - May be sign of fetal or maternal hypoxia
Fetal Monitoring

- Intermittent, short-term increases or decreases in fetal heart rate usually are normal
  - Variation can occur at any time and is sign of fetal suckling
  - Short-term periodic changes in fetal heart rate are common during
    - Fetal sleep
    - Fetal movement
    - Contractions associated with labor and delivery

General Management of the Obstetrical Patient

- If birth is not imminent, care for healthy patient should be limited to
  - Basic treatment modalities (airway, ventilatory, and circulatory support)
  - Transport
    - In absence of distress or injury, transport in comfortable position
    - Usually left lateral recumbant

General Management of the Obstetrical Patient

- May need to
  - Monitor ECG
  - Administer oxygen (5 to 7 L/min)
  - Monitor fetus based on patient assessment and vital sign determinations
  - Medical direction may advise IV access in some patients
  - Most drugs usually are inappropriate as they can mask symptoms of worsening condition
Trauma During Pregnancy

• 1 in every 12 pregnancies is complicated by physical trauma
  – When pregnant woman is severely injured, fetus at high risk for death
  – Anatomical and physiological changes of pregnancy can alter woman’s response to injury
    • May necessitate modified assessment, treatment, and transportation strategies

Maternal Injury

• Causes of maternal injury in decreasing order of frequency are
  – Vehicular crashes
  – Falls
  – Penetrating objects
• Injuries can result in trauma to gravid uterus, maternal bladder, liver, spleen
  – Injury that results in pelvic fracture can produce massive hemorrhage and damage to fetal skull
  – Severity of injury depends on many factors and may involve multiple organ systems

Maternal Injury

• During pregnancy, fetus is well protected within uterus
  – Amniotic fluid surrounds fetus
  – Fluid serves as excellent shock absorber
  – Because of this protection, fetus rarely experiences physical trauma except as result of direct penetrating wounds or extensive blunt trauma to maternal abdomen
Maternal Injury

• Greatest risk of fetal death is from interruption of blood flow to placenta from trauma to or death of mother
  – Can cause fetal distress and intrauterine demise
  – When dealing with pregnant trauma patient, promptly assess and intervene on behalf of mother

• Severe abdominal injury can result in
  • Premature separation of placenta
  • Premature labor or abortion
  • Rupture of uterus
  • Fetal death

Maternal Injury

• Causes of fetal death from maternal trauma
  – Death of mother
  – Separation of placenta
  – Maternal shock
  – Uterine rupture
  – Fetal head injury
Maternal Injury

- Direct life-threatening fetal injury uncommon in blunt trauma
  - In penetrating trauma, direct injury to fetus can cause fetal death, even if mother’s injuries are not life threatening

Assessment and Management

- Priorities in assessing and managing pregnant trauma patient are same as for nonpregnant patient
  - Adequate airway, ventilatory, and circulatory support with spinal precautions
  - Hemorrhage control
  - Rapid assessment
  - Stabilization
  - Rapid transport

Assessment and Management

- Resuscitating mother is key to survival of mother and fetus
  - During first stages of assessment and management, mother’s status should be focus
  - Despite severity, all pregnant trauma patients should be given high-concentration oxygen and transported for physician evaluation
Assessment and Management

• Examination should be thorough
  – Must detect, identify, manage injuries that contribute to hypovolemia or hypoxia
  – With normal increase in maternal blood volume, mother can tolerate more blood loss before showing signs and symptoms of shock

Assessment and Management

• 30 to 35 percent reduction in blood volume can produce minimal changes in BP but reduce uterine blood flow by 10 to 20 percent
  – Mother may maintain adequate BP at expense of fetus
• True amount of blood loss may be difficult to detect
  – Fetal monitoring is best available indicator of fetal well-being after trauma
  – Patient transport should never be delayed to assess fetal heart rate

Assessment and Management

• Accelerations of fetal heart rate above baseline are associated with fetal movement and contractions
  – May be early sign of fetal distress
  – Decreased fetal movement and increased fetal heart rate can indicate maternal shock
Assessment and Management

• Decelerations in fetal heart rates (below baseline) result from decrease in cardiac output and hypoxia
  – Hypoxic fetus in metabolic acidosis cannot accelerate his or her heart rate
    • Fetus becomes bradycardic (heart rate less than 100 bpm)
    • Sustained fetal bradycardia (lasting 10 minutes+) may be response to increased parasympathetic tone

• Fetus can tolerate this only for short time before becoming acidotic
  – Fetal bradycardia may be late sign of
    • Maternal hypotension
    • Hypoxia
    • Decreased maternal circulating volume
    • Fetal distress due to umbilical cord compression or prolonged decelerations in heart rate

How do you think the traumatized pregnant patient feels emotionally?
Special Management Considerations

• Special considerations in managing pregnant trauma patient
  – Oxygenation
  – Volume replacement
  – Hemorrhage control
• Labor is complication of trauma in pregnancy
  – Be ready to manage delivery or spontaneous abortion

Special Management Considerations

• Oxygenation
  – Adequate maternal airway maintenance and oxygenation are essential to prevention of fetal hypoxemia
  – Oxygen requirements are 10 to 20 percent > in normal, nonpregnant patient
  – Fetal hypoxia may occur with even small changes in maternal oxygenation
  – Administer oxygen at 5 to 7 L/min
  – Pulse oximetry should be used to monitor oxygen saturation AHA?

Special Management Considerations

• Volume replacement
  – Signs and symptoms of hypovolemia may not be present until blood loss is large
  – Blood is shunted preferentially from uterus to preserve maternal BP
  – Bleeding also may occur inside uterus
    • Pregnant uterus can sequester up to 2000 mL of blood after separation of placenta with little or no evidence of vaginal bleeding
Special Management Considerations

• Volume replacement
  – Crystalloid fluid replacement is indicated, even when BP remains normal
  – Vasopressors generally are not recommended
    • Decrease uterine blood flow and fetal oxygen delivery
    • Vasodilators sometimes are given to patients with severe preeclampsia who are hypertensive

Special Management Considerations

• Hemorrhage control
  – External hemorrhage should be controlled same as in nonpregnant patient
  – Use of the pneumatic antishock garment (PASG) is controversial in trauma, rarely used today
    • Most studies suggest role of the PASG for internal hemorrhage is very limited
    • If PASG is to be applied, only leg compartments should be inflated
    • Use of abdominal compartment may increase blood loss from pelvic injury
    • Abdominal can be inflated (by order of medical direction) when maternal and fetal deaths are imminent, rarely done

Special Management Considerations

• Hemorrhage control
  – Vaginal bleeding may point to placental separation, placental previa, uterine rupture
  – Avoid vaginal examination
    • May increase bleeding and bring on delivery
    • May be case especially if unsuspected placenta previa is present
  – Document amount and color of vaginal bleeding
  – Collect and transport any expelled tissue with patient to facility
Transportation Strategies

• Pregnant patients after 3 to 4 months gestation should not be transported in supine position because of potential for supine hypotension
  – In absence of suspected spinal injury, transport in left lateral recumbent position

Transportation Strategies

• If spinal injury is suspected, patient should be prepared for transportation in following manner
  – Fully immobilize patient on long spine board
  – After immobilization, carefully tilt board on its left side by logrolling secured patient 10 to 15 degrees
  – Place blanket, pillow, or towel under right side of board to move uterus to left side

Are facilities in your community equipped to handle high-risk deliveries?
Special Management Considerations

• Cardiac arrest can occur in pregnant women from number of causes
  – Many cardiovascular problems associated with pregnancy are related to changes in anatomy that produce decrease in return of venous blood

• Key interventions to prevent cardiac arrest in distressed or compromised pregnant patient
  – Placing patient in left lateral position
  – Manually and gently displacing uterus to left
  – Administering 100 percent oxygen
  – Giving fluid bolus
  – Key to resuscitation of fetus is often resuscitation of mother
  • Cannot be resuscitated until blood flow to her right ventricle is restored

• Aggressive resuscitation effort is justified in patients who are near term
  – Can allow for cesarean delivery at the hospital
  – Fetal survival improves if the time between maternal death and delivery is less than 5 minutes
  • Survival is poor if time is longer than 20 to 25 minutes
  – Alerting emergency department staff of the possibility of the need for emergency cesarean section is critical to infant survival
If cardiac arrest occurs, institute CPR with few modifications:

- Relieve pressure on aorta and inferior vena cava
  - Can be done by placing hands on abdomen to move uterus to patient’s right or left side
  - Displacement can also be accomplished by placing patient in left lateral tilt of 20 to 30 degrees, using blankets, pillows, or wedge to support pelvis
  - Generally perform chest compressions higher on sternum (ensures palpable pulse wave) to adjust for shifting of pelvic and abdominal contents toward head

Other patient management considerations unique to pregnant patient in cardiac arrest:

- Establish IV access above diaphragm to enhance systemic circulation of fluids and drugs
- Manage maternal hypotension (systolic BP less than 100 mm Hg or less than 80 percent of baseline) to avoid reduced placental perfusion
- Anticipate a difficult airway because of changes in airway mucosa that occur during pregnancy
- Standard drug doses and defibrillation therapies are recommended
Complications in Pregnancy

- Pregnancy can mask or worsen certain medical conditions and diseases
  - Hypertension
  - Diabetes
  - Infection
  - Neuromuscular disorders
  - Cardiovascular disease
- Conditions and diseases should be considered as part of differential diagnosis

Complications in Pregnancy

- Pregnancy can also cause certain conditions to present atypically
  - Acute appendicitis
  - Acute cholecystitis

Hyperemesis Gravidarum

- Symptoms begin within 2 to 5 weeks after conception
  - Nausea and vomiting generally eases after first trimester
  - Typically stops before 20 weeks gestation
- About 10 to 20 percent of mothers will have nausea and vomiting until delivery, usually less severe
  - HG in previous pregnancies often follows similar pattern of duration and severity in future pregnancies
Hyperemesis Gravidarum

- Exact cause unknown
  - Likely due to several factors that may include
    - Sensitivity of brain to motion
    - Slow gastric-emptying
    - Insufficient fluids or nutrition
    - Rapidly changing hormone levels during pregnancy due to rapidly growing placenta
    - GI reflux
    - Physical and emotional stress of pregnancy
    - Vitamin deficiencies

Management

- Can lead to
  - Dehydration
  - Weight loss
  - Malnutrition that can harm both mother and fetus
- Usually managed with
  - Antiemetics to control nausea and vomiting
  - Rehydration therapy
  - Vitamin and mineral supplements

Management

- Antidepressants are sometimes needed to manage depression that may accompany illness
  - Severe cases may require hospitalization and fluid therapy to manage dehydration
  - Prehospital care is primarily supportive
Rh Sensitization

- People with Rh-negative blood do not carry Rh marker on their red blood cells
  - People with Rh-positive blood do carry marker
  - Rh sensitization can occur during pregnancy if Rh-negative woman is pregnant with baby who has Rh-positive blood

Rh Sensitization

- If this occurs, immune system reacts to Rh factor by producing antibodies to destroy it (Rh sensitization)
  - During first pregnancy, Rh sensitization usually does not pose problem for mother or baby
    - First exposure of fetal blood to maternal blood normally does not occur until delivery
    - Then becomes sensitizing event
    - Maternal antibodies take some time to develop

Rh Sensitization

- Women are tested early in pregnancy for their Rh factor and to determine if they have been sensitized
  - Women who have Rh-negative blood who are not sensitized will require antibody tests until delivery
  - Newborn will have blood tested at birth
  - Injections of Rh immune globulin (e.g., RhoGAM) are usually given to prevent Rh sensitization
Rh Sensitization

• Women who are sensitized will need careful monitoring and serial blood testing to measure antibody levels during their pregnancy
  – Doppler studies and amniocentesis may be performed to monitor fetus
  – If fetal anemia is severe, baby may need blood transfusions before birth (intrauterine transfusion) and immediately after birth
  – Early caesarean delivery is common in these cases

Rh Disease

• An infant born with Rh disease may have no symptoms of illness
  – Other newborns can have a serious and life-threatening blood disorder known as erythroblastosis fetalis

Rh Disease

• Symptoms
  – Anemia
  – Jaundice
  – Edema
  – Enlarged liver or spleen
  – Hydrops fetalis (accumulation of fluid throughout body tissues, including lungs, heart, abdominal organs)

• Disease treated with blood transfusion
Pregnancy-Induced Hypertensive Disorders

- Occur in about 6 to 8 percent of pregnancies in U.S.
- Increase risk to mother and fetus
- Generally divided into three categories
  - Gestational hypertension
  - Preeclampsia
  - Eclampsia

Gestational Hypertension

- Occurs during pregnancy and resolves during postpartum period
  - Recognized by new BP reading of 140/90 mm Hg or higher
  - Thought to result from rejection of pregnancy by immune system and can be early sign of preeclampsia

Preeclampsia

- Gestational hypertension with proteinuria
  - Hypertension can be mild or severe (diastolic BP that exceeds 110 mm Hg)
  - Progression to eclampsia is unpredictable and can occur rapidly

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Preeclampsia

- Pathophysiology, which does not reverse until after delivery, is characterized by
  - Vasospasm
  - Endothelial cell injury
  - Increased capillary permeability
  - Activation of clotting cascade
- Signs and symptoms result from hypoperfusion to tissue or organs involved
  - Generalized edema is possible sign of preeclampsia although it may occur in both normal pregnancy or in pregnancy complicated by another disorder

Preeclampsia

- Factors
  - Advanced maternal age
  - Chronic hypertension
  - Chronic renal disease
  - Vascular diseases
    - Diabetes
    - Systemic lupus
    - Multiple gestation
Eclampsia

• Occurrence of seizures in patient with other signs of preeclampsia
  – Most common in patients with severe preeclampsia
  – Unknown origin
  – Primarily affects previously healthy, normotensive women in their first pregnancy
  – Occurs after 20 weeks gestation, often near term, but may occasionally be seen postpartum

Eclampsia

• Preeclampsia is dangerous for expectant mother and fetus for two reasons
  – Can develop and progress rapidly
  – Early symptoms are not often noticed by woman or may be attributed to other causes

Management

• Not all hypertensive patients have preeclampsia
  – Not all preeclamptic patients have hypertension
• Suspect preeclampsia or eclampsia with
  – Hypertension or headache
  – Visual changes
  – Epigastric pain in late pregnancy or within 2 weeks postpartum
Management

• Prehospital care is directed at
  – Preventing or controlling seizures
  – Treating hypertension (under guidance of medical direction)

Management

• Seizure activity in eclampsia most often is characterized by tonic-clonic activity
  – Often begins around mouth in form of twitching
  – Eclampsia may be associated with apnea during seizure
• Labor can begin suddenly and progress rapidly

Management

• Regimen for managing severe preeclampsia
  – Place patient in left lateral recumbent position to help maintain or improve uteroplacental blood flow
    • Will help lessen risk of insult to fetus
  – Handle patient gently and minimize sensory stimulation
    • Helps avoid seizures
  – Administer high-concentration oxygen and monitor oxygen saturation
    • Assist respirations as needed
Management

• Regimen for managing severe preeclampsia
  – Initiate IV therapy per protocol
  – Anticipate seizures at any moment
    • Be prepared to provide airway, ventilatory, and circulatory support
  – Be ready to administer following medications per medical direction and local protocol

Management

• Regimen for managing severe preeclampsia
  – Magnesium sulfate 10 percent
    • Loading dose is normally 4 grams over 20 minutes
    • Rare for this to make patient hypermagnesemic
    • Antidote (calcium gluconate) should be close at hand if necessary to treat respiratory depression

Management

• Regimen for managing severe preeclampsia
  – Diazepam or lorazepam
    • May precipitate fall in BP
    • May jeopardize fetal circulation
    • Closely monitor vital signs
  – Gently transport patient to proper medical facility
Gestational Diabetes Mellitus

- Diabetes caused by pregnancy
  - Occurs in about 4 percent of all pregnancies
  - Affects 135,000 women in U.S. each year
  - Thought to be related to inability of mother to metabolize carbohydrates

Gestational Diabetes Mellitus

- May be caused by deficiency of mother’s insulin or from placental hormones that block action of mother’s insulin (insulin resistance)
  - As a result, mother’s body is not able to produce or use all insulin it needs during pregnancy
  - Excessive amounts of her glucose are transmitted to fetus where stored as fat

Gestational Diabetes Mellitus

- Treatment
  - Regular glucose monitoring
  - Dietary modification
  - Exercise
  - In some cases, insulin injections
- Usually subsides after pregnancy
  - May return in later years or with future pregnancies
Gestational Diabetes Mellitus

- Most are aware of condition through prenatal care and have healthy pregnancies and healthy babies
  - Without treatment, mothers often have very large babies
  - More difficult labor and delivery (with increased risk for fetal and maternal injury) and longer recovery

Gestational Diabetes Mellitus

- Children whose mothers had GDM are at higher risk for certain health problems
  - Respiratory distress syndrome
  - Obesity
  - Related health issues as children or adults
  - Increased risk for developing type 2 diabetes during lifetime

Gestational Diabetes Mellitus

- Prehospital care for insulin-dependent GDM
  - Airway, ventilatory, and circulatory support
  - Glucose testing
  - Managing hypoglycemia with IV fluids and dextrose
  - Managing hyperglycemia with administration of IV fluids and insulin (per medical direction)
Infection

• Numerous infections can pose problems for pregnant mother and some can be spread to developing fetus and newborn
  – Examples: HIV infection, TORCH infection

TORCH Infection

• "TORCH" stands for following infections
  – T: Toxoplasmosis
  – O: Other infections: namely hepatitis B, syphilis, and herpes zoster (virus that causes chickenpox)
  – R: Rubella (formerly known as German measles)
  – C: Cytomegalovirus (CMV)
  – H: Herpes simplex virus (cause of genital herpes)

TORCH Infection

• TORCH infections can be passed to fetus in womb, resulting in fetal death or serious complications for newborn
  – Miscarriage
  – Congenital heart disease or heart defects (rare)
  – Hearing impairment, including deafness
  – Mental retardation or other learning, behavioral, or emotional problems
  – Anemia
  – Liver or spleen enlargement
TORCH Infection

• TORCH infections can be passed to fetus in womb, resulting in fetal death or serious complications for newborn
  – Pneumonia
  – Microcephaly (small head and brain size)
  – Jaundice
  – Low birthweight or poor growth inside the womb
  – Blindness or other vision problems, such as cataracts,
    a clouding of lens of eye
  – Skin rash or scarring

TORCH Infection

• Most TORCH infections can be prevented through
  – Immunization
  – Good personal hygiene
  – Safe sex practices
• In case of toxoplasmosis, prevention includes avoidance of raw meat and exposure to cats, which can sometimes carry disease

Bleeding Complications Related to Pregnancy

• Although most pregnancies are successful events, complications can and do occur
  – Vaginal bleeding can result from
    • Spontaneous abortion (miscarriage)
    • Ectopic pregnancy
    • Abruptio placenta
    • Placenta previa
    • Uterine rupture
    • Postpartum hemorrhage
As the mother loses blood from vaginal hemorrhage, what effect does that have on the fetus?

Spontaneous Abortion

- Spontaneous abortion is nontherapeutic termination of pregnancy from any cause before 20 weeks gestation.
  - Between 21 and 36 weeks gestation, is known as preterm birth
  - Abortion is most frequent cause of vaginal bleeding in pregnant women
  - Occurs in about 1 in 10 pregnancies

Spontaneous Abortion

- Most spontaneous abortions occur in first trimester, usually before 10th week
  - Patient often is anxious and apprehensive and complains of vaginal bleeding with pain
  - Bleeding may be slight (dime- or quarter-sized spotting) or profuse
Spontaneous Abortion

- Pain may be referred to lower back and is often described as cramp-like and similar to pain of labor or menstruation
  - May have suprapubic pain

Spontaneous Abortion

- When obtaining history, ascertain
  - Time of onset of pain and bleeding
  - Amount of blood loss (soaked sanitary pad suggests 20 to 30 mL of blood loss)
  - Whether patient passed any tissue with blood
    - If patient passed tissue during bleeding episodes, tissue should be collected and transported with patient for analysis

Management

- Assessment of all first-trimester bleeding should include close observation for signs of significant blood loss and hypovolemia
  - Measure vital signs often during transport
Management

- Depending on patient’s hemodynamic status, IV fluid therapy may be indicated
- All patients with suspected abortion should receive
  - Oxygen
  - Emotional support
  - Transportation for physician evaluation

Ectopic Pregnancy

- Occurs when fertilized ovum implants anywhere other than uterus
  - Ectopic gestation occurs in about 2 percent of all pregnancies
  - Leading cause of first-trimester death and accounts for more than 6 percent of all maternal deaths in United States
  - Death from ectopic pregnancy usually results from hemorrhage

Ectopic Pregnancy

- Causes
  - Most involve factors that delay or prevent passage of fertilized ovum to its normal site of implantation
  - Predisposing factors
    - Pelvic inflammatory disease
    - Adhesions from previous surgery
    - Tubal ligation
    - Previous ectopic pregnancy
    - Presence of intrauterine contraceptive device
Ectopic Pregnancy

- Obtaining full gynecological history is important in risk assessment
  - Although time from fertilization to rupture varies, most ruptures occur by 2 to 12 weeks gestation
- Signs and symptoms often are difficult to distinguish from those of
  - Ruptured ovarian cyst
  - Pelvic inflammatory disease
  - Appendicitis
  - Abortion (thus named the great imitator)

Ectopic Pregnancy

- Classic triad of symptoms
  - Abdominal pain
  - Vaginal bleeding
    • May be absent, spotty, or minimal
  - Amenorrhea
    • May be replaced by oligomenorrhea (scanty flow)

Ectopic Pregnancy

- Variable presentation of this type of pregnancy is one reason for its high-risk profile
  - Other symptoms of ectopic pregnancy include signs of early pregnancy
    • Referred pain to shoulder
    • Nausea, vomiting
    • Syncope
    • Classic signs of shock
Management

• Ruptured ectopic pregnancy is true emergency
  – Calls for initial resuscitation measures and rapid transport for surgical intervention
  – May become unstable quickly
  – If paramedic suspects an ectopic pregnancy, patient should be managed like any victim of hemorrhagic shock, with airway, ventilatory, and circulatory support and IV fluid resuscitation

Third-trimester Bleeding

• Third-trimester bleeding occurs in 4 percent of all pregnancies and is never normal
  – About half of bleeding episodes are result of
    • Abruptio placentae
    • Placenta previa
    • Uterine rupture

Abruptio Placentae

• Partial or full detachment of normally implanted placenta at more than 20 weeks gestation
  – Occurs in about 1 percent of all pregnancies
  – Severe enough to result in fetal death in about 15 percent of cases of abruption
Abruptio Placentae

• Predisposing factors
  – Maternal hypertension
  – Preeclampsia
  – Multiple pregnancies
  – Trauma
  – Previous abruption

Why is abruptio placentae associated with such a high fetal death rate?

Abruptio Placentae

• Common presentation is sudden third-trimester vaginal bleeding and pain
  – Vaginal bleeding may be minimal
  – Degree of shock is often out of proportion to visible blood loss because much of hemorrhage is concealed behind placenta
Abruptio Placentae

- More extensive the separation, greater the uterine irritability, resulting in tender abdomen and rigid uterus
  - Contractions may be present
  - Absence of fetal heart tones or a bradycardic fetal heart rate suggests severe abruptio placentae
    - Fetal death is likely

Placenta Previa

- Placental implantation in lower uterine segment partially or completely covering cervical opening
  - Occurs in about 5 in 1000 deliveries
  - Incidence is higher in preterm births
  - Characterized by painless, bright red bleeding with or without uterine contraction

Placenta Previa

- Bleeding may occur in episodes and may be slight to moderate
  - Bleeding may become more profuse if active labor begins
  - Fetal heart rate slows because of hypoxia
Placenta Previa

- Associated with
  - Increasing maternal age
  - Multiple pregnancies
  - Previous cesarean section
  - Previous placenta previa episodes
  - Recent sexual intercourse can lead to bleeding

Uterine Rupture

- Spontaneous or traumatic rupture of uterine wall
  - Most frequently results from reopening of previous uterine scar
  - May result from prolonged or obstructed labor, or direct trauma

Uterine Rupture

- Occurs in about 1 in 1500 pregnancies
  - Carries 0-1 percent maternal mortality rate and 2 percent fetal mortality rate in developed countries
  - Fetal mortality rate, which had been about 65 percent in the 1960s and 70s, has steadily declined in last two decades to under 5 percent
Uterine Rupture

- Characterized by
  - Sudden abdominal pain described as steady and “tearing”
  - Active labor
  - Early signs of shock (complaints of weakness, dizziness, anxiety)
  - Bleeding, which may not be visible
- On examination, abdomen usually is rigid
  - Patient complains of diffuse abdominal pain
  - Fetal parts may be felt easily through abdominal wall

Management

- Prehospital management third-trimester bleeding is aimed at preventing shock
  - Do not try to examine patient vaginally
    - May increase hemorrhage and precipitate labor

Management

- Emergency care measures should include
  - Provide adequate airway, ventilatory, and circulatory support (with spinal precautions if indicated)
  - Place patient in left lateral recumbent position
  - Begin transport immediately
  - Initiate IV therapy with volume-expanding fluid
Management

• Emergency care measures should include
  – Apply fresh perineal pad
    • Note time of application to assess bleeding during transport
  – Check fundal height
    • Document for baseline measurement
  – Closely monitor patient’s vital signs en route to medical facility
  – Closely monitor fetal heart rate

Labor and Delivery

• Parturition is process by which infant is born
  – Near end of pregnancy, uterus becomes increasingly irritable and exhibits occasional contractions
    • Become stronger and more frequent until parturition begins

• During and as result of these contractions, cervix begins to dilate
  – As uterine contractions increase, complete cervical dilation occurs to about 10 cm
  – Amniotic sac usually ruptures
  – Fetus, and shortly thereafter placenta, are expelled from uterus through vaginal canal
Stages of Labor

- Labor follows several distinct stages
  - Lengths of stages vary depending on whether mother is nullipara or multipara
  - Use stages of labor only as guideline in assessing labor progression in average pregnancy
First Stage of Labor

• Begins with contractions and ends when cervix is fully dilated at 10 cm
  — Divided into
    • Early labor
    • Active labor
    • Transition

First Stage of Labor

• Early labor
  — Defined by cervical dilation of 0 to 3 cm
  — Contractions occurring every 5 to 20 minutes and lasting 30 to 45 seconds
  — In this stage, mother typically notices backache and mild discomfort

First Stage of Labor

• Contractions progress over time, becoming longer, stronger, and closer together
  — Between contractions, mother feels relatively normal and pain free
  — For first-time mothers, may last 8 to 20 hours
    • With subsequent births, stage lasts 6 to 8 hours or less
First Stage of Labor

• Active labor
  – Defined by cervical dilation of 4 to 8 cm, and
    contractions 4 to 5 minutes apart, lasting about 60
    seconds
  – Marks beginning of intense contractions
  – Between contractions, mother may experience
    trembling, nausea, vomiting
  – Coached relaxation and slowed breathing between
    contractions often is comforting to mother
  – Usually lasts 1 to 2 hours

First Stage of Labor

• Transition
  – Defined by cervical dilation of 8 to 10 cm
  – Contractions are about 2 to 3 minutes apart and
    last for about 60 to 90 seconds
  – Contractions are intense and may occur with little
    rest for mother in between

First Stage of Labor

• May be accompanied by rectal pressure if
  baby’s head is positioned low
  – In many pregnancies, amniotic sac ruptures
    (rupture of membranes) toward end of first stage
  – Period of transition lasts only 15 to 30 minutes on
    average
What comfort measures can you use during transportation for the patient who is in the first stage of labor?

Second Stage of Labor

- Measured from full dilation of cervix to delivery of infant
  - Fetal head enters birth canal
  - Contractions become more intense and frequent (usually 2 to 3 minutes apart)
  - Often mother becomes diaphoretic and tachycardiac during this stage

Second Stage of Labor

- Experiences an urge to bear down with each contraction
  - May express need to have bowel movement
    - Normal sensation caused by pressure of fetal head against mother’s rectum
  - Mucous plug (sometimes mixed with blood, thus name bloody show) is expelled from dilating cervix and discharged from vagina
Second Stage of Labor

• Presenting part of fetus (usually head) emerges from vaginal opening
  – Known as crowning, indicates delivery is imminent
  – Usually lasts 1 to 2 hours in nullipara mother
  – Usually lasts 30 minutes or less in multipara mother

Third Stage of Labor

• Begins with delivery of infant and ends when placenta is expelled and uterus has contracted
  – Length of this stage varies from 5 to 60 minutes, regardless of parity

Signs and Symptoms of Imminent Delivery

• Following signs and symptoms indicate delivery is imminent; prepare for childbirth at scene
  – Regular contractions lasting 45 to 60 seconds at 1- to 2-minute intervals
    • Intervals are measured from beginning of one contraction to beginning of next
    • If contractions are more than 5 minutes apart, generally is time to transport to receiving hospital
  – Mother has urge to bear down or has sensation of bowel movement
Signs and Symptoms of Imminent Delivery

- Following signs and symptoms indicate delivery is imminent, prepare for childbirth at scene
  - Large amount of bloody show
  - Crowning occurs
  - Mother believes that delivery is imminent

Signs and Symptoms of Imminent Delivery

- With exception of cord presentation, do not try to delay delivery
  - If complications are anticipated or abnormal delivery occurs, medical direction may recommend expedited transport of patient to medical facility

Preparation for Delivery

- When preparing for delivery, try to provide area of privacy
  - Mother should be positioned on a bed, stretcher, or table
  - Surface should be long enough to project beyond mother’s vagina
  - Delivery area should be as clean as possible
    - Should be covered with absorbent material to guard against staining and contamination by blood and fecal material
Preparation for Delivery

• Mother should be placed on her back
  – Knees should be flexed and widely separated (or in another position preferred by mother)
  – Vaginal area should be draped appropriately
  – If delivery occurs in car, mother should be instructed to lie on her back across seat with one leg flexed on seat and the other leg resting on floorboard
  – Pillow or blanket, if available, should be placed beneath mother’s buttocks

Preparation for Delivery

• Will aid in delivery of infant’s head
  – Evaluate mother’s vital signs for baseline measurements
  – Monitor fetal heart for signs of fetal distress
  – Per protocol and medical direction, consider maternal oxygen administration and IV access for fluid administration or postdelivery administration of oxytocin if needed

Preparation for Delivery

• Mother should be coached to bear down and push during contractions and to rest between contractions to conserve strength
  – If mother finds it difficult to refrain from pushing, should be encouraged to breathe deeply or “pant” through her mouth between contractions
  – Deep breathing and panting help decrease force of bearing down and promote rest
Delivery Equipment

• Prehospital delivery equipment ("OB kit") generally includes
  – Surgical scissors
  – Cord clamps or umbilical tape
  – Towels
  – Surgical masks
  – 4 x 4 inch gauze sponges
  – Sanitary napkins
  – Bulb syringe and DeLee suction kit
  – Baby blanket and baby stocking cap
  – Plastic bag for placental transportation
  – Neonatal resuscitation equipment
  – IV fluid supplies

Delivery Equipment

• Personal protective measures should be used when assisting in a delivery
• Sterile technique should be used when handling equipment
Assistance with Delivery

• In most cases paramedic only assists in natural events of childbirth
  – Chief duties of the EMS crew are to prevent uncontrolled delivery and protect infant from cold and stress after birth

Assistance with Delivery

• Following are steps to be taken in assisting mother with normal delivery
  – Observe standard precautions
  – When crowning occurs, apply gentle palm counterpressure to infant’s head to prevent explosive delivery and tearing of mother’s perineum
    • If membranes are still intact, tear sac with finger pressure to allow escape of amniotic fluid

Assistance with Delivery

• Following are steps to be taken in assisting mother with normal delivery
  – After delivery of head, examine infant’s neck for looped (nuchal) umbilical cord
    • If cord is looped around neck, gently slip it over infant’s head
  – Suction infant’s mouth and nose with bulb syringe to clear airway
    • Perform suction after head appears but before next contraction
    • Next contractions deliver shoulders and chest
    • Risk of aspiration is minimal
Assistance with Delivery

- Following are steps to be taken in assisting mother with normal delivery
  - Support infant’s head as it rotates for shoulder presentation
    - Most infants present face down
    - Infant usually rotates to left or right so shoulders present in an anterior-posterior position

Assistance with Delivery

- Following are steps to be taken in assisting mother with normal delivery
  - If shoulders do not spontaneously deliver with next contraction, using gentle pressure, guide infant’s head downward to deliver anterior shoulder and then upward to release posterior shoulder
    - Rest of infant is delivered quickly by smooth uterine contraction

Assistance with Delivery

- Following are steps to be taken in assisting mother with normal delivery
  - Be careful to grasp and support infant as he or she emerges, using dry towel or clean piece of clothing
    - Hold infant with his or her head dependent to aid drainage of secretions
    - Place infant on mother’s abdomen if she is able to hold her infant
Assistance with Delivery

- Following are steps to be taken in assisting mother with normal delivery
  - Clear infant’s airway of any secretions with sterile gauze
    - Suction infant’s nose and mouth if there is course gurgling
  - Dry infant with sterile towels, and cover infant (especially head) to reduce heat loss
  - Record infant’s gender and time of birth

How do you think you will feel after delivering a healthy infant?
Evaluation of the Infant

• After delivery, infant should be positioned on side or with padding under back if needed
  – Clear airway and provide tactile stimulation to initiate respirations
  – If no need for resuscitation, assign an Apgar score at 1 minute and 5 minutes to evaluate in infant

Evaluation of the Infant

• Criteria for computing Apgar score
  – Appearance (color)
  – Pulse (heart rate)
  – Grimace (reflex irritability to stimulation)
  – Activity (muscle tone)
  – Respiratory effort
  – Each criterion is rated from 0 to 2
    • Numbers are added for total Apgar score
Evaluation of the Infant

- Score of 10 indicates that infant is in best possible condition
- 7 to 9 indicates that infant is slightly depressed (near normal)
- 4 to 6 indicates that infant is moderately depressed
- 0 to 3 indicates that infant is severely depressed

Evaluation of the Infant

- Most newborns have Apgar score of 8 to 10 at 1 minute after birth
  - Newborns with Apgar score less than 6 generally require resuscitation
    - Paramedic should not solely use Apgar score to determine need for resuscitation

Cutting the Umbilical Cord

- After paramedic delivers and evaluates infant and cord has stopped pulsing, umbilical cord should be clamped (or tied with umbilical tape) and cut
- Clamping or cutting cord may be delayed for at least 1 minute in term and preterm infants not requiring resuscitation
Cutting the Umbilical Cord

- Take following steps to manage umbilical cord
  - Clamp cord about 4 to 6 inches away from infant in two places
  - Cut between two clamps with sterile scissors or scalpel
  - Examine cut ends of cord to ensure there is no bleeding
    - If cut end attached to infant is bleeding, clamp cord proximal to previous clamp and reassess for bleeding
    - Do not remove first clamp
  - Handle cord carefully at all times because it can tear easily

Delivery of the Placenta

- If baby and mother are in good condition and if mother is agreeable, place baby at her breasts to encourage suckling
  - Stimulates release of oxytocin that will lead to decreased blood loss
  - Placenta normally is delivered within 20 minutes of infant
Delivery of the Placenta

- Transport should not be delayed for placental delivery
  - Placental delivery is characterized by
    - Episodes of contractions
    - Palpable rise of uterus within abdomen
    - Lengthening of umbilical cord protruding from vagina
    - Sudden gush of vaginal blood

Delivery of the Placenta

- After birth of infant and clamping of cord, mother should be told to bear down with contractions
  - Paramedic should place one hand lightly on mother’s abdomen and other hand should apply steady traction to cord
    - This is not pulling motion
    - Traction is used to keep cord taut until there is gush of vaginal blood or lengthening of cord

Delivery of the Placenta

- When placenta is expelled, should be placed in plastic bag or other container and transported with mother and infant to receiving hospital
  - At hospital, placenta will be examined for abnormality and completeness
Delivery of the Placenta

- Pieces of placenta retained in uterus can cause persistent hemorrhage and infection
  - After delivery of placenta, paramedic should assess mother’s perineum for tears
  - If tears are present, bleeding should be managed by applying sanitary napkins to area and maintaining direct pressure

Delivery of the Placenta

- Initiate fundal massage to promote uterine contraction
- Monitor mother during transport for signs of hemorrhage or shock
- Medical direction also may prescribe oxytocin to manage postpartum bleeding, if needed

Postpartum Hemorrhage

- Characterized by more than 500 mL of blood loss after delivery of newborn
  - Actual volume of blood loss is difficult to estimate with accuracy
  - Hemorrhage often occurs within first few hours after delivery
  - Can be delayed up to 24 hours
Postpartum Hemorrhage

• Occurs in about 5 percent of all deliveries and accounts for up to 25 percent of obstetric deaths
  – Often results from ineffective or incomplete contraction of interlacing uterine muscle fibers
  – Other causes of postpartum hemorrhage include retained pieces of placenta or membranes in uterus

Postpartum Hemorrhage

• Hemorrhage can also be caused by vaginal or cervical tears during delivery
  – Risk factors associated with postpartum hemorrhage
    • Uterine atony (lack of uterine tone) from prolonged or tumultuous labor
    • Grand multiparity
    • Twin pregnancy
    • Placenta previa
    • Full bladder

Management

• Postpartum hemorrhage can occur
  – In prehospital setting after field delivery
  – Home delivery
  – Delivery at independent birthing center
• Assessment and management are similar to those described for third-trimester bleeding
Management

• Take following measures to encourage uterine contraction
  — Massage the uterus
    • Palpate uterus for firmness or loss of tone
    • If uterus does not feel firm, apply fundal pressure by
      supporting lower uterine segment with edge of one hand
      just above symphysis and massaging fundus with other hand
    • Continue massaging until uterus feels firm
    • Reevaluate patient every 10 minutes
    • Note location of fundus in relation to level of umbilicus,
      degree of firmness, vaginal flow

Management

• Take following measures to encourage uterine contraction
  — Encourage infant to breast-feed
    • If mother and infant are stable and mother is
      agreeable, place newborn to her breast to encourage
      breast-feeding
    • Stimulation of breasts may promote uterine contraction

Management

• Take following measures to encourage uterine contraction
  — Administer oxytocin
    • Per medical direction and after ensuring that second
      fetus is not present in uterus, add 10 units of oxytocin
      to 1000 mL lactated Ringer’s solution
    • Infuse at 20 to 30 drops/min via microdrip tubing
      (titrated to severity of hemorrhage and uterine
      response or as ordered by medical direction)
    • Continue with fluid resuscitation as indicated by
      patient’s vital signs
Delivery Complications

- Most women have uncomplicated pregnancies
  - Prehospital deliveries seldom present any significant problems for mother, newborn, or paramedic crew

Cephalopelvic Disproportion

- Condition in which newborn’s head is too large or mother’s birth canal is too small to allow normal labor or birth
  - Mother often is primigravida and having strong, frequent contractions for prolonged period
  - Prehospital care is limited to
    - Maternal oxygen administration
    - IV access for fluid resuscitation if needed
    - Rapid transport

Abnormal Presentation

- Most infants are born head first (cephalic or vertex presentation)
  - Sometimes presentation is abnormal
    - Breech presentation
    - Shoulder dystocia
    - Shoulder presentation
    - Cord presentation (prolapsed umbilical cord)
Breech Presentation

• Largest part of fetus (head) is delivered last
  – Occurs in 3 to 4 percent of deliveries at term
  – More frequent with multiple births and when labor occurs before 32 weeks gestation

Breech Presentation

• Categories of breech presentation
  – Frank breech
    • Fetal hips are flexed and legs extend in front of fetus
    • Buttocks are presenting part
    • Accounts for about 60 to 65 percent of breech presentations
  – Complete breech
    • Fetus has both knees and hips flexed
    • Buttocks are presenting part
    • Accounts for about 5 percent of breech presentations

Breech Presentation

• Categories of breech presentation
  – Incomplete breech
    • Fetus has one or both hips incompletely flexed
    • Results in presentation of one or both lower extremities (often foot)
    • Accounts for about 25 to 30 percent of breech presentations
What resources can you use to assist in an abnormal presentation delivery?

Management

- Infant in breech presentation is best delivered in hospital where emergency cesarean section is alternative to vaginal delivery
  - Sometimes, paramedic must assist in breech delivery
Management

• If delivery is imminent, proceed as follows
  – Prepare mother for delivery as described before
  – Provide supplemental oxygen and IV access
    • Continuously monitor fetal heart rate
  – Allow fetus to deliver spontaneously up to level of umbilicus
    • If fetus is in frank breach presentation, gently extract legs downward after buttocks are delivered

Management

• If delivery is imminent, proceed as follows
  – After infant’s legs are clear, support his or her body with palm of hand and volar surface of arm
  – After umbilicus is visible, gently extract a 4- to 6-inch loop of umbilical cord to allow delivery without excessive traction on cord
    • Gently rotate fetus to align shoulders in anterior-posterior position
    • Continue with gentle traction until axilla is visible

Management

• If delivery is imminent, proceed as follows
  – Gently guide infant upward to deliver posterior shoulder
  – Gently guide infant downward to deliver anterior shoulder
  – Be aware that head often is delivered without difficulty after shoulder delivery
    • Be careful to avoid excessive head and spine manipulation or traction
Management

• If head does not deliver immediately, action must be taken to prevent suffocation of infant
  – Maintain fetal head in flexed position by placing index and middle fingers on either side of infant’s nose (the Mauriceau maneuver)
• Fetal body should be supported in neutral position, using care not to overextend baby’s neck
  – During this maneuver second rescuer should apply suprapubic pressure

Management

• If head does not deliver quickly, chance for good fetal outcome is poor
  – Mother should be transported rapidly

Shoulder Dystocia

• Occurs when fetal shoulders are wedged against maternal symphysis pubis
  – Blocks shoulder delivery
  – In this presentation, head delivers normally but then pulls back tightly against maternal perineum (the turtle sign)
Shoulder Dystocia

- Common condition in pregnancy, occurring in 1 in 300 deliveries
  - Complications
    - Brachial plexus damage
    - Fractured clavicle
    - Fetal anoxia from cord compression
  - 50 percent occur in women without risk factors

Management

- Calls for dislodging one shoulder and then rotating fetal shoulder girdle at angle into wider part of pelvic opening
  - Because shoulder is pressing against pelvis, there is potential for cord compression
- Paramedic should deliver anterior shoulder immediately after head
  - Several maneuvers can help paramedic successfully deliver infant when shoulder dystocia arises

Management

- Following steps represent one approach to shoulder dystocia
  - Position mother on her left side in dorsal-knee-chest position
    - Increases diameter of pelvis
  - Try to guide infant’s head downward to allow anterior shoulder to slip under symphysis pubis
    - Avoid excessive force or manipulation
Management

- Following steps represent one approach to shoulder dystocia
  - Gently rotate fetal shoulder girdle at angle to wider pelvic opening
    - Posterior shoulder usually delivers without resistance
    - Medical direction may recommend that paramedic try to deliver posterior shoulder first by rotating posterior shoulder downward and into left posterior quadrant
    - Anterior shoulder usually follows
  - After delivery, continue with resuscitative measures as needed

Shoulder Presentation

- Results when long axis of fetus lies perpendicular to that of mother
  - Position usually results in fetal shoulder lying over pelvic opening
  - Fetal arm or hand may be presenting part
  - Occurs in only 0.3 percent of deliveries but occurs in 10 percent of second twins

Management

- Normal delivery of a presentation is not possible
  - Provide mother with adequate oxygen, ventilatory and circulatory support, and rapid transport
  - Cesarean delivery is required whether fetus is viable or not
Cord Presentation

- Prolapsed cord occurs when cord slips down into or out of vagina after amniotic membranes have ruptured
  - Umbilical cord is compressed against presenting part of fetus
    - Diminishes fetal oxygenation from placenta

Cord Presentation

- Occurs in about 0.3 to 0.6 percent of all deliveries
  - When fetal distress is present, suspect prolapsed cord
  - Predisposing factors
    - Breech presentation
    - Premature rupture of membranes
    - Multiple gestation
    - Long cord
    - Preterm labor

Management

- Fetal asphyxia can ensue rapidly if circulation through cord is not reestablished and maintained until delivery
- If paramedic can see or feel umbilical cord in vagina, following steps should be taken
  - With gloved hand, gently push infant back into vagina
    - Elevate presenting part to relieve pressure on cord
    - Cord may retract spontaneously
    - Do not try to reposition cord
Management

• If paramedic can see or feel umbilical cord in vagina, following steps should be taken
  – Maintain this hand position during rapid transport to hospital
    • Definitive treatment is cesarean delivery
  – Position mother with hips elevated as much as possible
    • Trendelenburg or knee-chest position may relieve pressure on cord

Management

• If paramedic can see or feel umbilical cord in vagina, following steps should be taken
  – Administer oxygen to mother
  – If help is available, apply moist sterile dressings to exposed cord
    • Will minimize temperature changes that may cause umbilical artery spasm
  – Instruct mother to pant with each contraction to prevent bearing down

Other Abnormal Presentations

• Face or brow (military) presentation and occiput posterior presentation
  – Infant’s head is delivered face up instead of face down
    • Results in increased risks to fetus because of difficult labor and delivery
Other Abnormal Presentations

• Sometimes fetus has other associated abnormalities
  – May require cesarean delivery
• Goals of treatment
  – Early recognition of potential complications
  – Maternal support and reassurance
  – Rapid transport for definitive care

Premature Birth

• Infant born before 37 weeks gestation
  – Low birth weight (less than 2.5 kg [5.5 lb]) also determines prematurity
  • Conditions are not synonymous.
  – Occur in 8 to 10 percent of all pregnancies

Premature Birth

• After preterm labor, newborn is at increased risk for
  – Hypothermia because of large surface/mass ratio
  – Cardiorespiratory distress because cardiovascular system is premature
  • These infants require special care and observation
**Premature Birth**

- After delivery, prehospital management for premature infant includes
  - Keep infant warm
    - Dry infant, wrap in warm blanket, place infant on mother’s abdomen, and cover mother and infant
    - If transport time is delayed, very small (under 1500 g) infants should be wrapped in food-grade heat-resistant plastic wrap and placed under radiant heat in addition to other warming methods

- Frequently suction secretions from infant’s mouth and nares
- Carefully monitor cut end of umbilical cord for oozing
  - If bleeding present, manage as described before

- Administer humidified free-flow oxygen through makeshift oxygen tent
  - Aim oxygen flow toward top of tent
  - Do not allow it to flow directly into infant’s face
- Protect infant from contamination
  - Don mask and gown and minimize family member and bystander contact with infant
- Gently transport mother and infant
Premature Birth

- Note that tocolytic agents (drugs used to inhibit labor) are used widely today by some mothers who are at risk for premature birth
  - May be administered in home setting
  - Include
    - Magnesium sulfate
    - Nicardipine
    - Nifedipine
    - Ritodrine
    - Terbutaline
    - Indomethacin
  - Ask patient about any recent medication use, including use of tocolytic agents
Multiple Gestation

- Pregnancy with more than one fetus
  - Historically, twin births usually occurred in only 1 percent of all deliveries
  - Because of increasing use of fertility treatments, about 30 percent of every 1000 live births are now multiple births

Multiple Gestation

- Places more stress on maternal system and also is accompanied by increased complication rate
  - Associated complications
    - Premature labor and delivery (30 to 50 percent of twin deliveries are premature)
    - Premature rupture of membranes
    - Abruption placentae
    - Postpartum hemorrhage
    - Abnormal presentation
  - Mother who has not had prenatal care may be unaware of her multiple pregnancy

Do you have enough supplies on your ambulance to manage more than one delivery?
Delivery Procedure

• First-twin delivery is identical to single delivery with same presentation
  – Up to 50 percent of second-twin deliveries are not in normal presentation position
  – Fetuses are smaller in multiple births

Delivery Procedure

• After delivery of first twin, cut and clamp (or tie) umbilical cord as described earlier
  – Within 5 to 10 minutes after delivery of first twin, labor begins again
  – Delivery of second twin usually occurs within 30 to 45 minutes
  – Medical direction may recommend transport before delivery of second twin
  – Usually both twins are born before delivery of placenta

Delivery Procedure

• Infants in multiple births often are smaller than infants in single term births
  – Give special attention to keeping these infants warm, well oxygenated, and free from unnecessary contamination as described for premature infants
Delivery Procedure

- Postpartum hemorrhage may be more severe after multiple births
  - Hemorrhage may require
    - Fluid resuscitation
    - Uterine massage
    - Oxytocin infusion to control bleeding

Precipitous Delivery

- Rapid spontaneous delivery with less than 3 hours from onset of labor to birth
  - Results from overactive uterine contractions and little maternal soft tissue or bony resistance
  - Most often occurs in mother who is grand multipara

Precipitous Delivery

- Can be associated with soft tissue injury and uterine rupture (rare)
  - Has increased perinatal mortality rate because of trauma and hypoxia
  - Main danger to fetus is from cerebral trauma or tearing of umbilical cord
Precipitous Delivery

• If paramedic expects a precipitous delivery, attempts should be made to prevent explosive one
  – Can be done by providing gentle counterpressure to infant’s head
  – Do not attempt to detain fetal head descent
  – After delivery, infant should be kept dry and warm to prevent heat loss
  – Mother should be examined for perineal tears that often accompany rapid birth

Uterine Inversion

• Infrequent complication of childbirth where uterus turns “inside out”
  – Thought to occur in about 1 in 2000 deliveries
  – Serious condition
  – Resultant postpartum hemorrhage is associated with maternal mortality rate of around 15 percent

Uterine Inversion

• May occur suddenly after contraction or with increased abdominal pressure caused by coughing or sneezing
  – More often is caused by medical personnel or medical procedure (iatrogenic), secondary to excessive pulling on umbilical cord and fundal massage
Uterine Inversion

• Risk is higher when placenta has implanted high in uterus
  – Incomplete if uterine fundus does not extend beyond cervix
  – Complete if fundus does protrude through cervix
  – Prolapsed if entire uterus protrudes through vaginal ring

Uterine Inversion

• Signs and symptoms of uterine inversion include postpartum hemorrhage and sudden and severe lower abdominal pain
  – Hemorrhage may be profuse
  – Hypovolemic shock may develop quickly

Management

• Prehospital care
  – Airway, ventilatory, and circulatory support
  – Rapid transportation for physician evaluation
  – Medical direction may recommend that paramedic attempt manual replacement of uterus only if cervix has not yet constricted
Management

• Technique for manual replacement is as follows
  – Place patient in supine position
  – Do not attempt to remove placenta if it has not already been delivered
    • Doing so is likely to increase hemorrhage
  – Apply pressure with fingertips and palm of gloved hand and push fundus upward and through cervical canal
    • If this is ineffective, cover all protruding tissues with moist sterile dressings and rapidly transport patient

Management

• Manual replacement of uterus may be painful to patient
  – Medical direction may indicate use of analgesics
  – Paramedic should explain need for procedure to patient

Pulmonary Embolism

• Development of pulmonary embolism during pregnancy, labor, or postpartum period is significant cause of maternal death
  – Embolus often results from blood clot in pelvic circulation (venous thromboembolism)
  – Slight increased risk of pulmonary embolus with cesarean versus vaginal delivery
Pulmonary Embolism

- Patient often has classic signs and symptoms
  - Sudden dyspnea
  - Sharp, focal chest pains
  - Tachycardia
  - Tachypnea
  - Sometimes hypotension
- Prehospital care
  - Airway, ventilatory, and circulatory support
  - ECG monitoring
  - Rapid transportation for physician evaluation

Premature Rupture of Membranes

- Rupture of amniotic sac before onset of labor
  - Termed premature regardless of fetal age
  - Occurs in about 3 percent of pregnancies
  - In 10 to 15 percent of all cases, fetus is at or near term

Premature Rupture of Membranes

- Signs and symptom include history of trickle or sudden gush of fluid from the vagina
  - Transport patients for physician evaluation
  - Medical facility will prepare for delivery if patient begins labor
  - Delivery is required if infection of fetal membranes is diagnosed (chorioamnionitis)
Premature Rupture of Membranes

- Chorioamnionitis is linked to premature rupture of membranes occurring 24 hours before labor begins
  - Can occur with prolonged labor, in part due to multiple vaginal exams
  - Infection generally is accompanied by maternal fever, chills, and uterine pain
  - Infection is treated with antibiotics
  - Definitive treatment is delivery of fetus

Amniotic Fluid Embolism

- When amniotic fluid enters maternal circulation during labor or delivery or immediately after delivery, amniotic fluid embolism can occur
  - Probable routes of entry
    - Lacerations of endocervical veins during cervical dilation
    - Lower uterine segment or placental site
    - Uterine veins at sites of uterine trauma

Amniotic Fluid Embolism

- Particulate matter in amniotic fluid (e.g., meconium, lanugo hairs, and fetal squamous cells) forms an embolus and obstruct pulmonary vasculature
  - Amniotic fluid embolism is rare, occurring in 6 to 14.8 per 100,000 primigravid and multiparous deliveries, respectively
Amniotic Fluid Embolism

• Most often seen in multiparous women late in first stage of labor
  – Other conditions that can increase incidence
    • Placenta previa
    • Abruptio placentae
    • Intrauterine fetal death
  – Maternal mortality rate high

Amniotic Fluid Embolism

• Signs and symptoms of amniotic fluid embolism are same as those for pulmonary embolism
  – May include cardiopulmonary arrest
• Treatment
  – Airway, ventilatory, and circulatory support
  – Fluid resuscitation
  – Rapid transportation

Summary

• Cultural differences may influence a woman’s response to pregnancy and childbirth
  – Paramedic should be sensitive to these cultural beliefs
• Fertilization of an ovum by a sperm forms a zygote that divides as it passes through fallopian tube to become a morula
  – Trophoblast cells of the morula implant within 7 days after fertilization and transform into the life support systems of the embryo
  – Blastocyst cells develop into the embryo
Summary

- Placenta is a disklike organ
  - Composed of interlocking fetal and maternal tissues
  - Organ of exchange between mother and fetus
  - Blood flows from fetus to placenta through two umbilical arteries
    - Carry deoxygenated blood
  - Oxygenated blood returns to fetus through umbilical vein
  - Amniotic sac is a fluid-filled bag that completely surrounds and protects embryo

- Developing ovum is known as an embryo during first 8 weeks of pregnancy
  - After that time and until birth it is called a fetus
  - Gestation (fetal development) usually averages 40 weeks from time of fertilization to delivery of newborn
  - At birth, in normal newborn, the atriovenous shunts present in fetus close

- Gravida is total number of current and past pregnancies
  - Para refers to past pregnancies that resulted in a live birth
  - Pregnant woman undergoes many physiological changes that affect the genital tract, breasts, gastrointestinal system, cardiovascular system, respiratory system, and metabolism
Summary

• Patient history should include obstetrical history; presence of pain; presence, quantity, and character of vaginal bleeding; presence of abnormal vaginal discharge; presence of "bloody show"; current general health and prenatal care; allergies and medicines taken; and maternal urge to bear down.

Summary

• Goal in examining an obstetrical patient is to rapidly identify acute life-threatening conditions.
  – Part of this involves recognizing imminent delivery.
  – Then paramedic must take the proper management steps.
    • In addition to the routine physical examination, the paramedic should assess the abdomen, uterine size, and fetal heart sounds.

Summary

• If birth is not imminent, paramedic should limit prehospital care for healthy patient.
  – Limited to basic treatment modalities.
  – Include transport for physician evaluation.
• Causes of fetal death from maternal trauma include death of mother, separation of the placenta, maternal shock, uterine rupture, and fetal head injury.
Summary

To treat a critically ill pregnant patient, administer high-concentration oxygen
- Tilt patient left lateral
- Administer IV fluid if there are signs of shock
- Aggressively resuscitate mother in an attempt to save baby
- Cardiac arrest can occur from a number of causes
- Rapid transport is indicated

Summary

Hyperemesis gravidum presents with severe nausea, vomiting, weight loss, and electrolyte disturbance
- Fluid therapy is indicated if there are signs of dehydration

Rh sensitization occurs if the mother has Rh-negative blood and the baby Rh-positive blood
- It can cause anemia, jaundice, edema, enlarged liver or spleen, and hydrops

Summary

Gestational hypertension is onset of BP over 140/90 mmHg during pregnancy
- Can indicate preeclampsia

Preeclampsia occurs after 20 weeks gestation
- Criteria for diagnosis include hypertension, protein in the urine, and excessive weight gain with edema
- Eclampsia is characterized by the same signs and symptoms with addition of seizures or coma
Summary

• Gestational diabetes mellitus is diabetes caused by pregnancy
• Infection during pregnancy can place the mother and fetus at risk
  – TORCH is an acronym for infections mother can pass to fetus that cause fetal death or complication

Summary

• Vaginal bleeding during pregnancy can result from abortion (miscarriage), ectopic pregnancy, abruptio placentae, placenta previa, uterine rupture, or postpartum hemorrhage
  – Abortion is termination of pregnancy from any cause before 20 weeks gestation
  – Ectopic pregnancy occurs when a fertilized ovum implants anywhere other than the uterus
  – Abruptio placentae is partial or complete detachment of the placenta at more than 20 weeks gestation

Summary

• Placenta previa is placental implantation in the lower uterine segment partially or completely covering the cervical opening
• Uterine rupture is a spontaneous or traumatic rupture of the uterine wall
Summary

• First stage of labor begins with the onset of regular contractions
  – Ends with complete dilation of the cervix
• Second stage of labor is measured from full dilation of the cervix to delivery of infant
• Third stage of labor begins with delivery of infant and ends when placenta is expelled and uterus has contracted

Summary

• One of the primary responsibilities of the EMS crew is to prevent an uncontrolled delivery
  – Other is to protect infant from cold and stress after birth
• Criteria for computing Apgar score include appearance (color), pulse (heart rate), grimace (reflex irritability), activity (muscle tone), and respiratory effort

Summary

• More than 500 mL of blood loss after delivery of newborn is called postpartum hemorrhage
  – Often results from ineffective or incomplete contraction of the uterus
• Paramedics should be alert to factors that point to a possible abnormal delivery
Summary

• Cephalopelvic disproportion produces a difficult labor because of presence of a small pelvis, an oversized uterus, or fetal abnormalities
  – Most infants are born head first (cephalic or vertex presentation)

Summary

• Sometimes presentation is abnormal
  – In breech presentation, largest part of fetus (head) is delivered last
  – Shoulder dystocia occurs when the fetal shoulders impact against maternal symphysis pubis, which blocks shoulder delivery
    • Shoulder presentation (transverse presentation) results when long axis of fetus lies perpendicular to that of mother
    • Fetal arm or hand may be presenting part
    • Cord presentation occurs when cord slips down into vagina or presents externally

Summary

• Premature infant is born before 37 weeks gestation
• Multiple gestation is a pregnancy with 1+ fetus and is accompanied by an increased complication rate
• Precipitous delivery is rapid spontaneous delivery with < 3 hours from onset of labor to birth
  – Main danger to fetus is from cerebral trauma or tearing of umbilical cord
Summary

• Uterine inversion is a rare complication of childbirth
  – It is a serious complication
  – Uterus turns “inside out”
• Development of pulmonary embolism during pregnancy, labor, or postpartum period is a significant cause of maternal death

Summary

• Premature rupture of membranes is rupture of amniotic sac before onset of labor, regardless of gestational age
• Amniotic fluid embolism may occur when amniotic fluid enters maternal circulation during labor or delivery or immediately after delivery

Questions?