Chapter 6

Health Promotion During Pregnancy

BRIEF Outline

PRENATAL DEVELOPMENT
  Preconception
  Fertilization
  Development of Support Structures
  Stages of Fetal Development
  Development of Fetal Body Systems
  PREGNANCY
  Signs of Pregnancy

Maternal Changes During Pregnancy
  Diagnostic Tests of Fetal Status
  PRENATAL CARE
    Access to and Use of Prenatal Care
    Initial Visit
    Follow-up Visits
    Birthing Facilities and Staff
    Nursing Care

LEARNING Outcomes

After completing this chapter, you will be able to:

• Describe factors that influence prenatal development.
• Describe fetal development.
• Identify signs of pregnancy and maternal changes throughout pregnancy.
• Discuss nutritional requirements during pregnancy.
• Discuss common maternal discomforts during pregnancy and their treatment.
• Discuss prenatal care and client teaching related to prenatal care.

HEALTH PROMOTION ISSUE:
Pregnancy and Vegetarianism

NURSING PROCESS CARE PLAN:
Caring for Pregnant Woman Who Wants to Travel

CRITICAL THINKING CARE MAP:
Caring for an Undernourished Pregnant Woman
Pregnancy is a powerful and complex time in a woman’s life. She may be happily looking forward to the birth of a long-awaited first child. She may be wondering how to make adjustments for another of many children. She may be waiting fearfully through the period of pregnancy to give the baby up for adoption. In any case, she will face physical changes and processes that are unique and life altering. The role of the nurse in caring for pregnant women involves a great deal of emotional support and client education.

**Prenatal Development**

**Preconception**

For many years, health professionals have recognized that a healthy pregnancy begins before conception with good health habits. The focus of preconception care is to help the couple identify their pregnancy risk and prepare for conception. Unhealthy habits can affect the fetus before the mother knows she is pregnant. Likewise, good eating patterns and regular exercise can promote early fetal health. Box 6-1 provides a list of foods that are high in nutrients required by pregnant women.

**MALE CONTRIBUTION**

The health of the fetus is not just related to the mother. For example, smoking decreases sperm production and motility. Men who have been exposed to industrial chemicals father more stillborn and small-for-gestational-age infants. They are also involved in more pregnancies that end in preterm labor or spontaneous abortion. Because production of sperm ( spermatogenesis ) is a continuous process, men can decrease these risks by avoiding smoking and industrial chemicals for 3 to 4 months prior to conception.

**FEMALE CONTRIBUTION**

To carry a pregnancy with minimal risk, the mother should develop a healthy lifestyle well before conception. A healthy lifestyle includes eating a low-fat, high-fiber diet; exercising at least three times per week; and being within 15 pounds of one’s ideal weight. Because pregnancies are not always planned, avoiding unhealthy or risk-taking behavior will help ensure a healthy infant.

**NUTRITIONAL DEFICITS AND HARMFUL CHEMICALS**

Smoking, alcohol, and illicit drug use can have negative effects on pregnancy. Smoking during pregnancy can cause low birth weight and spontaneous abortion. Alcohol, even in moderate amounts, may cause fetal alcohol syndrome (discussed in Chapters 8 and 27), including craniofacial (head and face) malformation and central nervous system dysfunction. Illicit drugs can cause a variety of anomalies (abnormal development of organs or structures). Clients should be encouraged to stop using these substances prior to and during pregnancy. Medications, both prescription and over the counter, may interfere with normal pregnancy and should be discussed with the health care provider.

Because fetal development occurs on a strict timeline, the lack of a certain nutrient at specific times can have a profound effect on the developing organism. For example, a deficiency of folic acid between weeks 3 and 4 is the cause of spina bifida, a very serious birth defect (Figure 6-1). Addition of drugs or chemicals can have similarly profound effects. Drugs or other agents that cause abnormal fetal development are called teratogens. In the 20th century, women were sometimes prescribed the tranquillizer called thalidomide until it was realized that the drug interfered with normal limb development.
Children born to these mothers had only partially developed limbs.

**INFECTIOUS DISEASE COMPLICATIONS**

Infectious diseases and other disorders can have a negative impact on pregnancy. Routine testing should be done for infections such as syphilis, gonorrhea, chlamydia, and group B streptococcus. Testing may also be done for HPV, HSV, and HIV. (See Chapter 5 for a full discussion.) If the client tests positive, treatment should begin as soon as possible. Infection of the fallopian tubes (salpingitis) can cause scarring and narrowing of the lumen. A narrow fallopian tube can lead to infertility or tubal pregnancy. See Chapter 5 for disorders of the female reproductive system and Chapter 8 for high-risk pregnancy.

**Fertilization**

Fertilization is the process of uniting two sex cells into one (Figure 6-2). Pregnancy is the carrying of the resulting offspring in the uterus. Pregnancy can be described by the events that occur throughout the 40 weeks of development.
ovary (ovulation) and travel through the fallopian tube. The ovum and sperm usually unite in the outer one-third of the fallopian tube (Figure 6-3 [458x716]■). The timing of sperm deposition can have an effect on the success of the sperm in reaching the ovum. Sperm can survive in the female reproductive tract for up to 72 hours, but they are believed to be healthy and highly fertile for only about the first 24 hours (DeJonge, 2000). The ovum is considered fertile for only about 12 to 24 hours after ovulation. Therefore, fertilization or conception (the uniting of ovum and sperm) is only possible for a short time.

The fertilized egg is called a zygote. As it travels through the fallopian tube, the zygote divides rapidly to form a many-celled, mulberry-shaped mass called a morula. By the time the morula reaches the uterus in 4 to 5 days, the cells have formed a two-layer ball called a blastocyst. The outer layer or trophoblast will become the placenta and fetal membranes. The inner layer or embryonic disc will become the embryo. Figure 6-4 ■ illustrates the first days of development after fertilization and beginning embryonic development.

**Implantation**

Implantation is the embedding of the blastocyst into the endometrium (see Figure 6-3). One area of the trophoblast develops finger-like projections called villi (singular, villus) that secure the blastocyst to the uterus. The villi begin producing the chemical human chorionic gonadotropin (hCG) 8 to 10 days after fertilization; hCG is the chemical that pregnancy kits identify in order to determine pregnancy. It maintains the corpus luteum and stimulates it to continue producing estrogen and progesterone until 11 to 12 weeks. By that time, the placenta is developed enough to produce estrogen and progesterone to maintain the pregnancy.

**Development of Support Structures**

**Fetal Membranes**

The chorionic villi develop into the placenta. The remainder of the trophoblast becomes the outer layer of the membranes called the chorion (see Figure 6-4). The inner layer of the placenta, the amnion, originates from inside the blastocyst. The amnion grows as the fetus grows until it comes in contact with the chorion. Together the two layers form the fetal membranes, also called the “bag of waters.”

**Amniotic Fluid**

The amniotic fluid is formed by the amnion (see Figure 6-4). Amniotic fluid consists of about 98% water. It also contains glucose, proteins, urea, lanugo (fine fetal hair), and vernix.
Figure 6-3: Ovulation, fertilization, and implantation. During ovulation, the ovum leaves the ovary and enters the fallopian tube. Fertilization generally occurs in the outer third of the fallopian tube. Subsequent changes in the fertilized ovum from conception to implantation are shown. (Left inset) Sperm passage through cervical mucus. (1) During ovulation the mucoid strands become more parallel, allowing sperm to pass through easily. (2) When the client is not ovulating, tangled mucus strands prevent many sperm from passing. (Right inset) Implantation zygote. (Left inset: Data from Corson, S. [1990]. Conquering infertility: A guide for couples [4th ed.]. Vancouver, BC, Canada: EMIS-Canada, p. 16.)

caseosa (white, cheesy covering of the fetus’ skin). The fetus drinks the amniotic fluid and urinates into it. Amniotic fluid is reabsorbed and replaced every 3 hours. The amniotic fluid has the following important functions for the developing fetus:
- Maintains constant temperature
- Equalizes pressure around the fetus to allow for growth
- Cushions the fetus from injury and the umbilical cord from compression
- Prevents the fetal membranes from adhering to the fetus
- Allows the fetus to move freely
- Provides the fetus with fluid to swallow.

PLACENTA
By the third week post fertilization, the placenta has formed, but it is not fully functional until the 12th week. The placenta is a highly vascular organ connecting the mother and the fetus. The maternal side of the placenta is divided into irregular sections called cotyledons. Both the color and the texture are like liver. Note: Expulsion of the placenta with
the maternal side out is called the Duncan mechanism (think *Dirty Duncan*). The fetal side of the placenta is white and shiny, with the large blood vessels leading to the umbilical cord visible. *Note:* Expulsion of the placenta with the fetal side out is called the Schultz mechanism (think *Shiny Schultz*). Figure 6-5 illustrates the inner and outer surfaces of the placenta. At time of delivery, the placenta is about 8 inches in diameter and weighs approximately 1 pound.

The placenta has three main functions:

1. The placenta’s first function is transport. Oxygen, glucose, amino acids, electrolytes, and vitamins are transported from the mother’s blood to the infant’s blood. At the same time, carbon dioxide, urea, creatinine, and other fetal waste are transported from the infant’s blood to the mother’s blood. Many drugs entering the maternal blood will also be transported to the infant’s blood. Even though chemicals are transported between mother and infant, the blood cells do not cross the placenta.

2. The second function of the placenta is to produce hormones.
   - hCG, the basis for pregnancy tests, has already been discussed.
   - **Human placental lactogen (hPL)** stimulates changes in maternal metabolism. This change makes protein, glucose, and minerals more readily available to the fetus. The hPL is an *insulin antagonist* (it decreases the woman’s metabolism of glucose). The mother’s body
prepares for lactation because of an increase in hPL. The placenta also produces estrogen and progesterone to maintain the endometrium, stimulate breast development, and prevent uterine contractions.

- **Relaxin** is a hormone produced by the placenta that causes softening in the collagen connective tissue of the symphysis pubis and sacroiliac joints. In late pregnancy, these joints become moveable, making a larger passageway for the delivery.

3. The third function of the placenta is production of fatty acids, glycogen, and cholesterol for fetal use. Enzymes that are necessary for the transport of nutrients to the fetus are also produced by the placenta.

**UMBILICAL CORD**

The **umbilical cord** connects the fetus to the placenta. The umbilical cord consists of a white gelatinous tissue called **Wharton's jelly**. Wharton's jelly protects and supports the two umbilical arteries and one umbilical vein. At term, the umbilical cord is 22 to 24 inches long. When the Wharton's jelly comes in contact with air following delivery, it contracts, clamping the blood vessels to prevent bleeding.

**Stages of Fetal Development**

Fetal development, or **gestation**, is marked in weeks following conception. Fetal development takes place in three stages.

- **Stage I**, the pre-embryonic stage, is from fertilization through 14 days or 2 weeks. This is the time when the fertilized ovum travels through the fallopian tube, differentiates into trophoblast and embryonic disc, and attaches to the endometrium.
- **Stage II**, the embryonic stage, is from weeks 3 through 8. During this stage, all body systems are formed. Developing cells are at greatest risk to environmental teratogens, infections, and drugs at this time.
- **Stage III**, the fetal stage, is from weeks 9 through 38 to 40. During this stage, all body systems are refined and begin to function. Some body systems will take several years to reach their maximum functioning.

**Development of Fetal Body Systems**

The embryonic disc forms three germ layers from which all body systems develop. Table 6-1 identifies the three germ layers and the body systems derived from each. Figure 6-6 illustrates stages of fetal development through week 30.

<table>
<thead>
<tr>
<th>Germ Layers and Body System Development</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Embryonic (Germ) Layer</strong></td>
</tr>
<tr>
<td>Endoderm (inner layer)</td>
</tr>
<tr>
<td>Mesoderm (middle layer)</td>
</tr>
<tr>
<td>Ectoderm (outer layer)</td>
</tr>
</tbody>
</table>

Figure 6-5. Placenta. (A) Maternal side of the placenta (“Dirty Duncan”). (B) Fetal side (“Shiny Schultze”). (Courtesy of Marcia London, RNC, MSN, NNP)
Blastocyst completely implanted.
Primitive placental circulation established.
Epithelium growing over surface defect.

Day 1 of menses
Stage 1
Fertilization
Stage 2 begins
Zygote divides
Stage 3 begins
Morula
Stage 4
Early blastocyst
Implantation begins
Late blastocyst
Stage 5 begins
Stage 2 begins
Primary villi
Dorsal aspect of embryo
Prochordal plate
Embryonic disc

Amniotic cavity
Lacunae appear in syncytiotrophoblast.
Bilaminar disc
Primitive yolk sac

Stage 7 begins
First missed menstrual period
Stage 8 begins
Intraembryonic mesoderm
Stage 9 begins
Brain
Stage 10 begins
Heart begins to beat
Stage 11 begins
Neural folds fusing
Stage 12 begins
Otic pit
Stage 13 begins
Heart begins to beat
Stage 14 begins
Neural groove
Stage 15 begins
Heart begins to beat
Stage 16 begins
Heart begins to beat
Stage 17 begins
Heart begins to beat

Figure 6-6. (A) Human prenatal development from conception to 10 weeks. (B) Human fetal development: 12 weeks, 20 weeks, 24 weeks, and 30 weeks. (A: Reprinted from Moore, K. L. [1989]. The developing human: Clinically oriented embryology [3rd ed.]. Philadelphia: WB Saunders, pp. 2–4, with permission from Elsevier, Inc.)
Chapter 6  Health Promotion During Pregnancy

A (continued)

<table>
<thead>
<tr>
<th>Week</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>CR: 16.0 mm, eyelids beginning. Tip of nose distinct. Toe rays may appear. Ossification may begin.</td>
</tr>
<tr>
<td>9</td>
<td>Beginning of fetal period. Genitalia show some characteristics but still easily confused with .</td>
</tr>
<tr>
<td>10</td>
<td>Face has human profile. Note growth of chin compared to day 44. Clitoris. Labium minus. Urogenital groove. Labium majus.</td>
</tr>
</tbody>
</table>

B

12 weeks 20 weeks 24 weeks 30 weeks

Figure 6-6. Continued.
Development is very systematic, occurring from head to toe (cephalocaudal), from proximal to distal, and from general to specific.

**CARDIOVASCULAR SYSTEM**

The cardiovascular system begins by the development of a series of tubes, carrying a primitive blood. On day 21, one area of the vessel begins to beat. This area will develop into the heart through a series of foldings, openings, and closings. Most heart anomalies occur during weeks 6 to 8.

**Fetal Circulation**

Because fetal circulation must carry blood to and from the placenta, and because the fetal respiratory system does not oxygenate blood, several structures are different in the fetus. Blood flows from the internal iliac arteries in the fetus to the placenta through two umbilical arteries (Figure 6-7 ■). In the placenta, blood gases are exchanged, waste is removed, and nutrients are received. The fetal blood then flows back to the fetus through one umbilical vein. After entering the fetal abdomen, the umbilical vein divides into two branches. The umbilical vein carries blood to the fetal
liver. The other branch, the ductus venosus, carries blood to the inferior vena cava.

Two structures limit the amount of blood going to the fetal lungs. Inside the fetal heart, the foramen ovale is an opening in the septum between the right atrium and the left atrium. The higher pressure in the right atrium pushes some blood through the foramen ovale into the left atrium. Outside the fetal heart, the ductus arteriosus connects the main pulmonary artery to the aorta. Some blood flows from the pulmonary artery to the aorta, thus bypassing the lungs. The small amount of blood actually reaching the lungs is necessary for the development of the respiratory system (see Figure 6-7). Usually, shortly after birth, these fetal structures close, and the cardiovascular system adjusts to normal functioning (see Figure 19-1).

Fetal blood is initially formed on day 14 in the yolk sac, a structure inside the ovum. The liver will not be able to make blood cells until the fifth week, and the bone marrow will not function until the 10th week. Fetal hemoglobin (HgbF) has a greater attraction for oxygen than maternal hemoglobin does. This helps ensure that the fetus receives an adequate supply of oxygen. The blood type is determined at the time of conception.

**Multifetal Circulation**

Circulation for multifetal pregnancy with twins may take two different paths, as was shown in the illustration of fraternal and identical twins in Chapter 5, Figure 5-18. Two blastocysts may develop into two distinct chorions with two amnions; these are fraternal twins. If the inner cell mass of one blastocyst splits in two, identical twins are formed, with two amnions within one chorion.

**RESPIRATORY SYSTEM**

The respiratory system begins as lung buds during the 6th week of development and is formed by the 23rd week, but there are not enough alveoli to maintain gas exchange outside the uterus. By weeks 20 to 23, the primitive lungs begin to produce surfactant. Surfactant is a substance that decreases the surface tension of fluid inside the alveoli, allowing the lungs to expand. By the 24th week, the lungs are capable of borderline support outside the uterus. Therefore, the age of viability (the ability to live outside the uterus) is 24 weeks. An infant born at this time would require intensive nursing care, including ventilation support. Surfactant production matures by the 35th week, making the prognosis more favorable. The lungs will continue to add alveoli until adulthood.

**NERVOUS SYSTEM**

The head and brain develop rapidly in the fetus. By the fourth week, the brain has differentiated into lobes. A week later, the cranial nerves are present and function. By the sixth week, the entire central nervous system is present. The peripheral nervous system, however, will not be functioning completely for another 7 to 10 years.

**Special Senses**

The ears begin to appear in the 3rd week, low on the head, in the region of the lower jaw. They gradually move upward to their designated place on the head by the 8th week. The infant can hear and respond to sound by the 12th week.

In the 3rd week, the eyes can be seen as large dark discs on the side of the developing head. By the 7th week, eyelids form and seal to protect the developing retina (Figure 6-8). A week later, the eyes have moved to the front of the face. The eyelids will remain closed until the 28th week of development.

**GASTROINTESTINAL SYSTEM**

The gastrointestinal system begins formation in the fourth week. The esophagus, stomach, small intestines, liver, pancreas, and most of the colon are developed from the same germ layer, the endoderm. (Refer to Table 6-1.) The oral cavity, pharynx, and anus are formed from the ectoderm. Occasionally, there is incomplete development in the area where the germ layers meet, resulting in congenital anomalies.

By the 12th week, the fetus swallows amniotic fluid, and the liver is making bile. In the 16th week, meconium (the first fetal stool) is made from amniotic fluid, bile, and epithelial cells. Meconium should remain in the colon until after delivery.

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**clinical ALERT**

The passage of meconium prior to delivery signals some type of fetal distress.
RENAL SYSTEM
The urinary system is another body system that develops from more than one germ layer. (See Table 6-1.) The kidneys, ureters, and trigone, or lower section of the bladder, come from the mesoderm. The remainder of the bladder, female urethra, and proximal male urethra come from the endoderm. The distal male urethra develops from the ectoderm. Any disruption in development results in complex anomalies. (Renal disorders are discussed in Chapter 23.)

The kidneys develop in several stages in the pelvis and ascend to their normal location. The kidneys begin producing urine in the 10th week, and the fetus urinates into the amniotic fluid by the 11th week of development.

REPRODUCTIVE SYSTEM
The gender of the fetus is determined at conception (see Chapter 4). The fetus develops undifferentiated gonads until the 7th week. In the presence of the Y chromosome, testosterone stimulates the gonads to differentiate into testes. Sperm will not be produced until puberty. Testosterone will also stimulate the development of male genitalia. Without testosterone, the gonads develop into ovaries, and female genitalia form internally. Ova will be produced and will remain in the ovary until puberty. External male and female genitalia can be identified in the 12th week of development (Figure 6-9).

MUSCULOSKELETAL SYSTEM
Limb buds appear in the 4th week. Cartilage forms a primitive skeleton covered by muscles by the 6th week. A week later, fetal movement can be seen on ultrasound. However, quickening (the first fetal movements felt by the mother) will not occur until the 16th to 20th weeks. By
the end of the 8th week (Figure 6-10 ■). Ossification in the bones begins, marking the transition from embryo to fetus.

INTEGUMENTARY SYSTEM
The skin of the fetus is thin and pink. Because the skin lacks fat until the last 4 to 6 weeks of gestation, the blood vessels can readily be seen. Fingernails and toenails reach the end of the digit by the 36th week. Lanugo begins to disappear in the 28th week, leaving only hair on the scalp and, at times, the shoulders and upper back at birth. Vernix caseosa covers the skin to protect it from the amniotic fluid. The white cheesy substance is gradually absorbed by the skin, leaving a small amount in the body folds and the lower back. Skin color is determined at conception.

PREGNANCY

Signs of Pregnancy
During pregnancy, many physiologic changes will be reported by the mother or observed by the health care provider. These changes can be categorized as presumptive, probable, and positive signs of pregnancy: fatigue, abdominal enlargement, and quickening.

PRESumptIVE SIGNS
The subjective signs the mother experiences during pregnancy are presumptive signs. They may be indicators of other conditions besides pregnancy, so are not diagnostic in nature. Presumptive signs include amenorrhea, nausea and vomiting, breast changes, urinary frequency, fatigue, abdominal enlargement, and quickening.

Amenorrhea
Amenorrhea, or the absence of menses, is usually the first sign a woman notices that may cause her to think she is pregnant. Although pregnancy is the most common cause of amenorrhea, other causes could be hormone imbalance, stress, menopause, or tumors.

Nausea and Vomiting
Nausea and vomiting usually occur in the morning, but could occur at any time. Sometimes called morning sickness, these symptoms are commonly experienced during early pregnancy. However, nausea and vomiting are also associated with many other conditions.

Breast Changes
Breast changes, such as tenderness, tingling, and enlargement of the breast, occur in early pregnancy. Many women also experience these changes with the monthly period.

Urinary Frequency
Urinary frequency occurs because the enlarging uterus presses on the bladder, giving the woman the feeling of needing to urinate often. Other disorders, including urinary infection and abdominal tumor, could also elicit this sensation.

Fatigue
Fatigue is most often noted in the first few months of pregnancy, but many other conditions result in fatigue as well.

Abdominal Enlargement
Abdominal enlargement is noted by the 12th week, but may be evident earlier in the very thin woman or later in the large woman. Abdominal enlargement may also be noted when tumors are present.

Quickening
Quickening is a fluttering sensation felt as the fetus moves. The sensation begins between 16 and 22 weeks and gradually becomes stronger and more frequent. Other causes, such as muscle twitch or intestinal gas, can mimic this sensation. Because the mother is experiencing this subjective sensation, quickening is a presumptive sign.

Pregnancy is usually diagnosed before the woman experiences all presumptive signs. Denial of pregnancy could keep the woman from noticing the presumptive signs. False pregnancy, also known as pseudopregnancy, occurs when the nonpregnant woman so strongly wants to be pregnant that she experiences the presumptive signs. Treatment of pseudopregnancy is by psychiatric means.
PROBABLE SIGNS
The health care provider can identify objective signs that could indicate pregnancy. Because these signs could also indicate other conditions, they are not diagnostic. Probable signs include positive pregnancy tests, ballottement, and uterine changes.

Positive Pregnancy Tests
Pregnancy tests screen for the presence of hCG in the urine or blood. Most home tests are based on the amount of hCG in the urine. A test may be positive 8 to 14 days after conception. Some medications, the timing and accuracy of specimen collection, and the presence of hormone-producing tumors can affect the accuracy of the test.

Ballottement
Ballottement is a test for pregnancy in which the examiner puts two fingers into the vagina and pushes upward on the uterus. If the woman is pregnant, the fetus will rebound against the fingers.

clinical ALERT
A false-positive result for pregnancy can be obtained with ballottement. It is possible for a tumor in the uterus to elicit the same response.

Uterine Changes
There are physical signs that can be checked to assess the probability of pregnancy (Figure 6-11): Hegar's sign (a softening of the lower uterine segment), Goodell's sign (a softening of the cervix), and Chadwick's sign (a bluish-purple discoloration of the cervix and vagina) can be observed in the first few weeks of pregnancy. The fundus of the uterus can be palpated just above the pubis at 12 weeks. Tumors can also cause uterine enlargement.

When probable signs are combined with presumptive signs, there is a strong indication of pregnancy.

POSITIVE SIGNS
Positive signs are diagnostic of pregnancy. No other condition can cause these signs. Positive signs of pregnancy include hearing fetal heart tones, visualization of the fetus, and fetal movement felt by examiner.

Hearing Fetal Heart Tones
Fetal heart tones (FHT), or the fetal heartbeat, can be heard with a Doppler by 10 to 12 weeks. The normal FHR is 120 to 150 bpm. It is important to distinguish the FHR from the maternal heart rate. When auscultating the abdomen, a soft blowing sound can be heard. The sound occurring at the same rate as the maternal pulse is called uterine soufflé and is caused by increased maternal blood flow to the uterus. The sound occurring at the FHR is called funic soufflé and is caused by fetal blood flowing through the umbilical cord.

Visualization of the Fetus
An abdominal ultrasound can detect a viable pregnancy by the 6th week. A transvaginal ultrasound can detect a trophoblast by the 10th day after conception. X-ray examination of the pelvis is rarely done due to the risk of radiation exposure to the fetus and maternal reproductive organs.

Fetal Movement Felt by Examiner
The fetus usually does not kick strongly enough for the examiner to feel the movement until the 20th week.

Diagnostic tests to determine fetal status are discussed later in this chapter.

Figure 6-11. (A) Hegar’s sign. (B) Goodell’s and Chadwick’s signs. (Reproduced, with permission, from McGraw-Hill Companies, Inc. DeCherney, A. H., & Pernoll, M. L. [1994]. Current obstetric and gynecologic diagnosis and treatment [8th ed.]. Norwalk, CT: Appleton & Lange, p. 187.)
Maternal Changes During Pregnancy

Typically, the progression of the pregnancy is described in 3-month blocks of time called trimesters. This might seem confusing when fetal development is described by weeks. A normal pregnancy takes three trimesters equaling 9 calendar months, or 40 weeks equaling 10 lunar months.

Pregnancy causes many changes in a woman’s body and additional work in each body system that increases the need for oxygen (Figure 6-12). A healthy woman’s body can tolerate the additional work. However, if disease is present, the additional stress may be harmful or life threatening to the mother.

REPRODUCTIVE SYSTEM

The most obvious changes occur in the reproductive system. Prior to pregnancy, the uterus (see Figure 4-12) is a small, pear-shaped, thick-walled organ weighing 2 oz (60 g) with a capacity of 10 mL. By the end of pregnancy, the uterus is a large, thin-walled organ weighing 2 lb and having a capacity of 5 L. The structure of the three muscle layers of the uterus allows the uterus to expand evenly in all directions. Painless contractions called Braxton Hicks contractions occur throughout the pregnancy but become more noticeable after the 20th week and during periods of rapid fetal growth.

The fundus should enlarge 1 cm/wk. If the fundus is not enlarging at this rate, the fetus is not growing at a normal rate. Enlargement of more than 1 centimeter each week would indicate the fetus is growing too rapidly or that a multiple pregnancy may exist.

**clinical ALERT**

From 20 to 36 weeks, the fundal measurement is normally 2 centimeter plus or minus the number of weeks' gestation. So, for example, at 24 weeks' gestation, fundal measurement is typically 22 to 26 centimeter.

The cervix secretes thick, sticky mucus that plugs the os to prevent micro-organisms from entering the uterus. When the cervix dilates, the mucus plug is expelled. Certain changes that occur in the presence of estrogen are present by the 8th week. These signs (Hegar's sign, Goodell's sign, and Chadwick's sign) were described previously under Signs of Pregnancy.

The ovaries do not release ova during pregnancy. The corpus luteum produces estrogen and progesterone for approximately 12 weeks until the placenta takes over this function. Ovulation usually returns within 3 months following delivery.

The breasts enlarge due to hormonal influence. The areolae darken, and the nipple becomes more erect. Colostrum, a yellowish fluid rich in antibodies, is secreted in the last trimester and the first few days following delivery. The colostrum is then replaced with milk.

CARDIOVASCULAR SYSTEM

The female’s pulse rate increases by 10 to 15 bpm by the end of pregnancy. Cardiac output also increases, and there is an increased blood flow to the uterus and kidneys. The blood pressure decreases slightly in the second trimester due to the influence of progesterone on the smooth muscles of blood vessels, but it returns to normal during the third trimester.

**clinical ALERT**

Any increase in blood pressure above the normal range should be monitored and reported to the health care provider.

Supine Hypotensive Syndrome

The enlarging uterus puts pressure on the deep veins of the pelvis, resulting in venous stasis in the lower extremities. Venous stasis leads to dependent edema and varicose veins of the legs, vulva, and rectum. Supine hypotensive syndrome
pressure is relieved. In the third trimester, the infant descends into the pelvis, again pressing on the bladder.

Glomerular infiltration and tubular reabsorption increase to remove the added waste products from the fetus. If the kidneys are unable to reabsorb the glucose, glucosuria will result.

occurs after the 20th week when the mother lies supine (Figure 6-13 ■). The heavy uterus presses on the inferior vena cava, resulting in reduced blood flow back to the right atrium. The mother will experience low blood pressure, dizziness, and pale skin. The mother should be encouraged to sleep on her side to prevent hypotension. Positioning on the left side allows greater blood return than the right.

Physiologic Anemia of Pregnancy
There is an increase in blood volume during pregnancy. The red blood cell count is only slightly elevated, but there is a considerable increase in plasma volume. Physiologic anemia of pregnancy occurs between 26 and 32 weeks’ gestation. It results from this hemodilution, as evidenced by a hematocrit of 34% to 40%. The number of white blood cells increases beginning in the second trimester. An increase in platelets, fibrin, fibrinogen, and other coagulation factors coupled with venous stasis increases the risk of thrombus formation.

RESPIRATORY SYSTEM
The enlarging uterus presses upward on the diaphragm. The ribs move outward, and the diameter of the chest increases. Progesterone relaxes smooth muscles, decreasing airway resistance and allowing more oxygen into the lungs. Estrogen may cause swelling of the nasal mucosa. As shown in Figure 6-12, oxygen demand is greatly increased during pregnancy.

RENNAL SYSTEM
In the first trimester, urinary frequency is caused by the enlarging uterus that presses on the bladder. During the second trimester, the uterus has elevated out of the pelvis and the pressure is relieved. In the third trimester, the infant descends into the pelvis, again pressing on the bladder.

Glomerular infiltration and tubular reabsorption increase to remove the added waste products from the fetus. If the kidneys are unable to reabsorb the glucose, glucosuria will result.

**GASTROINTESTINAL SYSTEM**
“Morning sickness,” usually beginning in the 6th week and ending in the 12th week, results from an increase in progesterone. Although not always experienced in the morning, nausea and vomiting can range from mild to severe. Prolonged vomiting or hyperemesis gravidarum leads to dehydration and electrolyte imbalance. It should be reported to the health care provider. Relaxation of the cardiac sphincter can cause gastric reflux. Medication may be prescribed for these discomforts.

The enlarging uterus puts pressure on the stomach and intestines. Progesterone relaxes the smooth muscle of the intestine, resulting in a decrease in peristalsis. Together, these two factors increase the likelihood of constipation.

**MUSCULOSKELETAL SYSTEM**
The increased size and weight of the uterus cause an alteration in the mother’s center of gravity. To compensate, the mother increases the lumbar curve (lordosis) and widens her
stance. The pelvic joints become more relaxed in preparation for childbirth. These factors result in low backache and waddling gait.

Muscle cramps, especially in the lower legs, result from venous stasis and possible electrolyte imbalance. Low calcium and phosphorus levels are the most common cause. The mother should be encouraged to consume adequate amounts of milk products to prevent muscle cramps.

**INTEGUMENTARY SYSTEM**

Changes in skin color result from an increase in maternal hormones. The areolae, nipples, and vulva darken. **Linea nigra** (Figure 6-14) is a dark line on the abdomen from the umbilicus to the pubis. **Chloasma**, or “mask of pregnancy,” is a darkening of the forehead, cheeks, and area around the eyes. Both are more obvious in later pregnancy.

**Striae gravidarum**, or “stretch marks,” occur when the underlying connective tissue separates during periods of rapid growth. Following pregnancy, these dark red streaks gradually lighten and become white, but they never disappear.

**ENDOCRINE SYSTEM**

Prolactin, from the anterior pituitary gland, stimulates the production of milk by the mammary glands (see Figure 4-17). **Oxytocin**, a hormone produced by the posterior pituitary gland, stimulates uterine contractions, and the “let-down reflex,” or release of milk after delivery.

The placenta hormones are insulin antagonists, which means they counteract insulin. As a result, the pancreas needs to produce more insulin to meet the mother’s requirements. If the mother is marginal in meeting the need for more insulin, gestational diabetes results. Gestational diabetes is discussed in detail in Chapter 8.

Hormonal increases affecting the reproductive system are discussed under that system.

**Diagnostic Tests of Fetal Status**

A variety of tests can be used to assess fetal well-being.

**ULTRASOUND**

Ultrasound is used to outline the shape and determine the consistency of various organs. Not only is ultrasound used to diagnose pregnancy, but it can also be used to determine the exact position, size, and gender of the fetus and to identify some developmental anomalies. Ultrasound is used in conjunction with other diagnostic tests throughout pregnancy.

**AMNIOCENTESIS**

Amniocentesis, the withdrawal of amniotic fluid through a needle inserted into the abdomen and the uterus, is a means of gathering data about the developing fetus. It is usually performed between 15 to 18 weeks’ gestation. The amniotic fluid and fetal cells contained in the fluid are studied to determine genetic abnormalities, maternal–fetal blood incompatibilities, and the maturity of the fetal lungs. Procedure 6-1 describes the nurse’s role in assisting with amniocentesis and similar tests (Figure 6-15 A–C).

**PERCUTANEOUS UMBILICAL CORD SAMPLING**

Percutaneous umbilical cord sampling is also similar to amniocentesis; it is done in the second and third trimesters. The physician locates the fetal parts, and identifies the placenta and umbilical cord by ultrasound. A needle is then inserted through the maternal abdomen into an umbilical vessel in the umbilical cord, approximately 1 to 2 inches (2.5–5 centimeters) from the placenta (see Figure 6-15B). Fetal blood is aspirated and analyzed for chemical content. The test is useful in diagnosing inherited blood disorders, detecting fetal infection, and determining acid–base balance. It is used for diagnosing **erythroblastosis fetalis** (a serious anemia, usually resulting from maternal antibodies to Rh-positive fetal blood), as well as **thrombocytopenia** (a lack of platelets in circulating blood). If necessary, a blood transfusion can be completed.
rupture of the fetal membranes, placental detachment, hemorrhage (for both mother and infant), and infection. The mother and fetus are monitored closely for an hour or more after the procedure. Follow-up ultrasound may be used to ensure that bleeding or hematoma formation has not occurred. If complications do arise, all efforts will be made to protect both mother and infant. However, in the case of fetal hemorrhage, death may not be preventable.

NURSING CONSIDERATIONS

Parents need emotional support when an amniocentesis or other invasive tests are performed. They will be concerned not only about the welfare of the infant during the test, but also about the possibility of a life-altering diagnosis such as Down syndrome (see Chapter 16). Test results may not be obtained for several days or weeks, and the period of waiting may

CHORIONIC VILLUS SAMPLING

Chorionic villus sampling is similar to amniocentesis. Using ultrasound to locate the baby, a needle is inserted through the mother’s abdomen into the uterus and the placenta. A sample of placental tissue is aspirated through the needle (see Figure 6-15C). The tissue, formed from the zygote, reflects the genetic makeup of the fetus. The procedure, done between the 10th and 12th weeks of gestation, identifies chromosomal anomalies early in the pregnancy. The parents can then make an informed decision regarding the welfare of the baby or possible termination of the pregnancy.

RISKS OF INVASIVE TESTING

Amniocentesis, chorionic villus sampling, and percutaneous umbilical blood sampling do carry some risk to the mother and infant. Complications could include premature rupture of the fetal membranes, placental detachment, hemorrhage (for both mother and infant), and infection. The mother and fetus are monitored closely for an hour or more after the procedure. Follow-up ultrasound may be used to ensure that bleeding or hematoma formation has not occurred. If complications do arise, all efforts will be made to protect both mother and infant. However, in the case of fetal hemorrhage, death may not be preventable.

NURSING CONSIDERATIONS

Parents need emotional support when an amniocentesis or other invasive tests are performed. They will be concerned not only about the welfare of the infant during the test, but also about the possibility of a life-altering diagnosis such as Down syndrome (see Chapter 16). Test results may not be obtained for several days or weeks, and the period of waiting may
6. The physician applies sterile drapes, then inserts the needle into the uterus and withdraws a sample of amniotic fluid, umbilical cord blood, or chorionic villi (see Figure 6-15A, B, or C, respectively). Note: If a sample of the placenta is obtained for chorionic villus sampling or blood is obtained from an umbilical vessel, other specimen containers may be needed. The nurse may be required to assist with continuous ultrasound monitoring. Sterile technique is essential to prevent infection of the mother and fetus.

7. Obtain specimen containers from physician, attach proper labels, and send to lab with appropriate lab slips. It is the nurse's responsibility to be sure materials are labeled properly. Prompt delivery to the lab helps ensure accurate results.

8. Assist physician to apply a small dressing over puncture site.

9. Monitor the woman and fetus for 30 minutes, paying close attention to the mother's vital signs, FHR, and any contractions she may be having. Changes from normal may indicate complications that would need to be reported.

10. Assess the woman's blood type and determine if Rh immune globulin (RhoGAM) is needed and administer if necessary (see Chapter 8). To prevent Rh sensitization of an Rh-negative woman during the procedure, Rh immune globulin is administered.

11. Instruct the woman to report any of the following changes immediately to her primary care provider:
   a. Unusual increase in fetal activity or lack of fetal movement
   b. Vaginal discharge, either clear fluid or bloody drainage
   c. Uterine contractions or abdominal cramping
   d. Fever or chills.
   These are signs of complications that will require further medical investigation and treatment.

12. Encourage the woman to engage in only light activity for 24 hours and to increase her fluid intake. Light activity will decrease uterine irritability. Fluid is needed to replace the amniotic fluid.

13. Complete the client record. Full documentation includes date and time, vital signs, type of procedure, name of provider who performed the procedure, number of specimens obtained and disposition of specimens, repeat VS and client status, record of discharge teaching, and follow-up care.

SAMPLE DOCUMENTATION

[date] 0800 T 98.2, P 82, R 24, BP 136/72, FHR 150. No uterine contractions noted at this time. Dr. Lopez here.

Amniocentesis completed without incident. 3 specimens sent to lab.

0830 Vital signs have remained stable since amniocentesis P 78, R 22, BP 130/70, FHR 144–150. No contractions noted on monitor. Written instructions provided and reviewed regarding home care, activity, and warning signs to report to the physician. Instructed to return to clinic in 1 week for follow-up. __________

J. Sole, LPN

seem unbearable. If a life-altering diagnosis is made, the parents may decide to keep the pregnancy and accept responsibility for a sick infant, or they may decide to terminate the pregnancy. Either decision brings tremendous emotional strain requiring support, understanding, and nonjudgmental care.

MANUAL READING OF FETAL HEART RATE
In a low-risk pregnancy with no unusual concerns, the nurse may perform manual FHR monitoring at most prenatal visits. Procedure 6-2 ■ provides steps in obtaining a manual FHR. Internal fetal heart monitoring is another method and is discussed in Chapter 8.

NONSTRESS TEST
A nonstress test (NST) is used to assess fetal movement and FHR. External fetal monitoring equipment is attached to the client's abdomen, and the FHR is recorded. The client identifies episodes of fetal movement. Fetal movement can be stimulated with a low-frequency vibrator. Each episode consists of a FHR increase of 15 bpm, lasting 15 seconds. The test is reactive or normal if two episodes occur in a 20-minute period.

BIOPHYSICAL PROFILE
Biophysical profile is a test that assesses five variables: fetal breathing, fetal movement, fetal tone, amniotic fluid volume, and fetal reaction. To complete a biophysical profile, a combination of ultrasound and nonstress test are used. The LPN/LVN is sometimes taught to collect the data; the trained registered nurse, certified nurse midwife, or physician interprets the data. A score of 8 or more indicates positive fetal well-being.
Figure 6-15. (A) Amniocentesis. (B) Umbilical blood sampling. (C) Chorionic villus sampling using transcervical approach.
PROCEDURE 6-2 Assessing the Fetal Heart Rate with Doppler

**Purpose**
- To provide information about the status of the fetus
- To monitor the status of the fetus

**Equipment**
- Doppler device
- Ultrasonic gel

**Interventions**

1. Apply gel to the diaphragm of the Doppler. Gel aids sound transmission and helps maintain contact between the Doppler diaphragm and the abdomen.

2. Uncover the woman’s abdomen. Position the diaphragm in the midline of the woman’s abdomen halfway between the umbilicus and the symphysis pubis (Figure 6-16). This is the most likely position in which to hear the fetal heartbeat.

3. When pulse is heard, check it against the woman’s pulse. If they are the same, reposition the Doppler diaphragm. If the pulse is not heard, move the diaphragm laterally. If the rates are the same, they are probably both the mother’s pulse.

4. If the rates are not the same, count the beats for 1 minute. Count each double rhythm as one beat. The fetal heart sound has a double rhythm. The beats per minute are the FHR.

5. Auscultate the FHR at each office visit during pregnancy. FHR is also assessed before, during, and for 30 seconds after a uterine contraction during labor. This can provide information about fetal health or distress.

6. Follow recommendations for frequency of auscultation and documentation. The health and risk status of the woman will determine the usual frequency of auscultation.
   - FHR should be assessed at each office visit.
   - FHR should be assessed anytime the mother accesses health care for any reason during the pregnancy.
   - FHR should be assessed if the woman believes she is in labor. Fetal assessment during labor is discussed in Chapter 7.

**SAMPLE DOCUMENTATION**

(date) 0800 FHR 144. Mother reports increase in fetal activity over the past 2 weeks, especially after periods of maternal activity. Reassured that this is usual during the sixth month of pregnancy. 

K. Doss, LPN
Prenatal Care

Research has shown that prenatal care, beginning as soon as possible, has a dramatic effect on the outcome of the pregnancy. The goals of prenatal care include:

- A healthy, prepared mother who has minimal discomforts during the pregnancy
- The safe delivery of a healthy fetus
- A prepared family, including father or partner, siblings, grandparents, and any significant others.

Initial Visit

The initial visit to a health care provider can be happy or sad, depending on the woman’s feelings about being pregnant. A comfortable environment, open communication, and the nurse’s attitude are important in putting the woman at ease. At times, the father or partner attends the initial visit, and the nurse assesses the degree of support the woman receives from this person.

The initial visit is generally longer than subsequent visits. Unless a health history has been obtained prior to pregnancy, it must be done at this time. The health history includes identifying all past medical issues that could have an impact on the pregnancy. A menstrual history will be obtained, including any past pregnancies. (Table 6-2 provides key terms used to refer to pregnancy.) The woman’s gravida (G—number of pregnancies), para (P—number of deliveries after 24 weeks’ gestation), and the outcome of past pregnancies will be recorded. Possible outcomes include abortion (A—the loss of pregnancy before the 24th week), preterm delivery (P—delivery after the 24th week but before the 38th week), term delivery (T—delivery between 38 and 42 weeks), and whether the infant lived (L—live birth). It is important to remember that the word abortion is used medically to describe the loss of a pregnancy, whether

Figure 6-17 illustrates the U.S. infant mortality rate by race and ethnicity from 1995 to 2002. It is clear from this illustration that there is more work to be done in finding and eliminating the causes of infant mortality.

Initial Visit

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Figure 6-17. U.S. infant mortality rate* by race and ethnicity, 1995–2002. (Courtesy of Centers for Disease Control and Prevention, Rockville, MD.)

• Per 1,000 live birth.
• American Indian/Alaska Native.
• Hispanic mothers might be of any race.
Common Terms Describing Pregnancy

<table>
<thead>
<tr>
<th>KEY TERM</th>
<th>DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abortion (A)</td>
<td>Loss of pregnancy prior to viable age (usually 24 weeks)</td>
</tr>
<tr>
<td>Gravida (G)</td>
<td>Number of pregnancies, including present pregnancy</td>
</tr>
<tr>
<td>Para (P)</td>
<td>Number of deliveries after a viable age, including infants born alive and stillborn infants</td>
</tr>
<tr>
<td>Term (T)</td>
<td>A pregnancy between 38 and 42 weeks' gestation</td>
</tr>
<tr>
<td>Preterm (P)</td>
<td>A delivery after 24 weeks but before 38 weeks' gestation</td>
</tr>
<tr>
<td>Postterm</td>
<td>A delivery after 42 weeks' gestation</td>
</tr>
<tr>
<td>Nulligravida</td>
<td>Never pregnant</td>
</tr>
<tr>
<td>Nullipara</td>
<td>Never delivered an infant after 24 weeks' gestation</td>
</tr>
<tr>
<td>Primagravida</td>
<td>First pregnancy</td>
</tr>
<tr>
<td>Primipara</td>
<td>First delivery after 24 weeks' gestation</td>
</tr>
<tr>
<td>Multigravida</td>
<td>Pregnant two or more times</td>
</tr>
<tr>
<td>Multipara</td>
<td>Delivered two or more times after 24 weeks' gestation</td>
</tr>
<tr>
<td>GP/TPAL</td>
<td>Gravida, para/term, preterm, abortion, live birth</td>
</tr>
</tbody>
</table>

that is a planned, elective event or a spontaneous occurrence (miscarriage). A woman who has been pregnant three times, had one abortion at 8 weeks, and had two live births at term would be designated G-3P2/T2A1.

A physical assessment, done by the health care provider, will include a detailed assessment of the reproductive organs. An ultrasound may be performed to diagnose pregnancy. Blood may be drawn to determine a baseline for future reference.

**NAEGELE’S RULE**

If pregnancy is diagnosed, the duration of pregnancy will be determined. Terms used to refer to the expected delivery date are:
- Estimated date of birth (EDB)
- Estimated date of delivery (EDD)
- Estimated date of confinement (EDC).

The EDB can be determined by several methods. **Naegle’s rule** is the most common. To apply the rule, take the first day of the LMP, subtract 3 months, and add 7 days. For example, if the LMP was on January 18; the EDB would be October 25. Adjustments to the rule have to be made if the LMP falls at the end of a month, for example, on July 29. Subtracting 3 months would be April, and adding 7 days would be April 36. April has only 30 days, so the EDB would be advanced to May 6. A gestational wheel or chart can be used for quick reference. Figure 6-18 illustrates a gestational wheel that provides expected dates for the EDB and other pregnancy landmarks.

**Follow-up Visits**

The pregnant woman should return to the clinic for follow-up care on the following schedule:
- Every 4 weeks for the first 28 weeks
- Every 2 weeks during weeks 29 to 36
- Every week after 36 weeks until delivery.

**LABORATORY TESTS RELATED TO PREGNANCY**

Laboratory blood values often change while a woman is pregnant. Laboratory tests (Table 6-3) compare pregnant and nonpregnant values. It can provide valuable data for assessing a woman’s health. Nurses should be familiar with values that are normal for women during pregnancy.

**MEDICATIONS DURING PREGNANCY**

The use of any medication—prescription, nonprescription, or herbal—during pregnancy carries a risk to the fetus. A teratogen is any chemical that can cause abnormal development...
Although the first trimester is the most critical for teratogenic effects of drugs, some drugs can be harmful in the second and third trimesters as well. If medications must be taken during pregnancy, it is wisest to use the lowest dose for the shortest period of time. It is usually safer to select well-known medications than to choose newer medication whose teratogenic effect may be unknown. Pregnant women should be advised to avoid all herbs during the first trimester. During the second and third trimesters, whole plant extracts are safer than concentrated extracts. Certain categories of herbs should be avoided throughout the pregnancy including abortifacients (abortion-inducing herbs that induce menstruation), nervous system stimulants, stimulant laxatives, and others. Box 6-4 lists common herbs to avoid during pregnancy because they are considered abortifacients.

Most care providers prescribe a prenatal multivitamin with iron to be taken once a day. This nutritional supplement will help ensure that adequate amounts of vitamins and iron are ingested for the developing fetus. Some women may want to omit the vitamin due to nausea in the early weeks of pregnancy. However, at this time, the woman may not be consuming adequate amounts of nutritious foods. She should be encouraged to adjust the time of day the medication is taken instead of omitting a dose.

Pregnant women may develop headache, respiratory infections, allergies, or flu as often as the nonpregnant woman. Commonly, over-the-counter medications are used to treat these conditions. Many physicians, nurse midwives, and nurse practitioners provide their clients with a list of over-the-counter medications that are acceptable to use during pregnancy. If the client wants to use another medication or herbal supplement, she should contact her health care provider. It is important for the client to communicate to

### TABLE 6-3

<table>
<thead>
<tr>
<th>TEST</th>
<th>PREGNANT VALUES</th>
<th>NONPREGNANT VALUES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hematocrit (%)</td>
<td>32–42</td>
<td>37–47</td>
</tr>
<tr>
<td>Hemoglobin (g/dL)</td>
<td>10–14</td>
<td>12–16</td>
</tr>
<tr>
<td>Platelets (mm$^3$)</td>
<td>Significant increase 3–5 days after birth</td>
<td>150,000–350,000</td>
</tr>
<tr>
<td>White blood cells (mm$^3$)</td>
<td>5,000–15,000</td>
<td>4,500–10,000</td>
</tr>
<tr>
<td>Fibrinogen (mg/dL)</td>
<td>Up to 600</td>
<td>175–400</td>
</tr>
<tr>
<td>Serum glucose (mg/dL)</td>
<td>65 (fasting) less than 140 (2 hour PP)</td>
<td>70–80</td>
</tr>
<tr>
<td>Sodium (mEq/L)</td>
<td>135–145</td>
<td>135–145</td>
</tr>
<tr>
<td>Potassium (mEq/L)</td>
<td>3.5–5.1</td>
<td>3.5–5.1</td>
</tr>
<tr>
<td>Chloride (mEq/L)</td>
<td>100–108</td>
<td>100–108</td>
</tr>
<tr>
<td>Bicarbonate (mEq/L)</td>
<td>22–26</td>
<td>22–26</td>
</tr>
<tr>
<td>Calcium (mg/dL)</td>
<td>Falls 10% by term</td>
<td>8.5–10.5</td>
</tr>
</tbody>
</table>

in the fetus. Drugs are one form of teratogen. To prevent teratogenic effects, the U.S. Food and Drug Administration (FDA) has established five categories of potential risk for the development of birth defects. Box 6-3 identifies these categories. It is important to recall that herbal medicines are categorized as dietary supplements rather than drugs. Therefore, the testing, regulation, and standardization of herbs may not be as strict.

### BOX 6-3

**Pregnancy Categories for Medications**

**Category A**
- Studies do not show a risk to the fetus in the first trimester of pregnancy.
- There is no evidence of risk in the second and third trimesters.

**Category B**
- Animal studies have not proven a risk to the fetus, but there are no adequate studies in pregnant women.
- Animal studies show adverse effects, but adequate studies on pregnant women have not shown risk to the human fetus.

**Category C**
- Animal studies show an adverse effect on the fetus, but there are no adequate studies in humans.

- There are no animal reproduction studies, and no adequate studies have been performed in humans.
- The drug may be used during pregnancy if the benefits of the drug outweigh its possible risks.

**Category D**
- Evidence shows a risk to the human fetus.
- The potential benefits from the use of the drug may outweigh the risk to the fetus.

**Category X**
- Studies in animals and humans prove fetal abnormalities, or reports indicate evidence of fetal risk.
- The risks of using these drugs clearly outweigh any possible benefits.
any health care provider that she is pregnant (or suspects pregnancy) before she takes any prescribed medication. For example, a woman who is 6 months pregnant could be taken to an emergency room for treatment following an automobile accident. Because the pregnancy may not be obvious, it is important for her to communicate to the nurses, doctor, and x-ray technician that she is pregnant. When getting a new prescription medication filled at the drug store, the pregnant woman should inform the pharmacist that she is pregnant and question the safety of the drug at this time.

**DISCOMFORTS OF PREGNANCY**

Numerous changes occur in a woman’s body during pregnancy. Initially, there may be feelings of “fullness” or morning sickness, heavier breasts, and a slight sensation of bloating. Later changes affect the woman’s center of gravity and her circulation. They alter how a woman stands, walks, and rests, and many of these changes involve some level of discomfort. It is helpful for women to be prepared for these changes ahead of time. Table 6-4 identifies common discomforts and possible interventions to alleviate or decrease the discomforts of pregnancy.

<table>
<thead>
<tr>
<th>DISCOMFORT</th>
<th>CAUSE</th>
<th>INTERVENTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nausea and/or vomiting</td>
<td>Increased hormones Enlarged uterus pushing on stomach</td>
<td>Limit fluids upon waking Eat dry toast or crackers Eat small amounts frequently Avoid fried or spicy foods</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heartburn</td>
<td>Gastric reflux due to relaxed cardiac sphincter from effects of progesterone and pressure from enlarged uterus</td>
<td>Avoid fried or spicy foods Eat small amounts, avoid overeating Sit up for 30 minutes after eating Take antacids ONLY with care provider’s approval</td>
</tr>
<tr>
<td>Flatulence</td>
<td>Slowing of GI motility due to progesterone and pressure from enlarged uterus</td>
<td>Omit gas-forming foods Increase bulk in diet Have regular bowel movement</td>
</tr>
<tr>
<td>Constipation</td>
<td>Slowing of GI motility due to progesterone and pressure from enlarged uterus Decreased activity Inadequate fiber and fluids in diet Iron supplements</td>
<td>Increase fiber from fruits and vegetables (raisins, prunes, apples) Daily activity (walking) Increase fluids</td>
</tr>
<tr>
<td>Hemorrhoids</td>
<td>Straining to have bowel movement Pressure from enlarged uterus on rectal veins</td>
<td>Prevent constipation Cool compresses Warm sitz bath Topical analgesic ointment</td>
</tr>
</tbody>
</table>

Nutrition is a vital part of prenatal care. Good nutrition provides crucial ingredients to supply the developing fetus. It also provides energy for the extra demands being made on the mother’s body.

If the woman is already eating a well-balanced diet, little change needs to be made during pregnancy. During pregnancy, the woman should add 300 calories a day to her diet. (This compares to an additional 500 kcalories a day she will need if she breastfeeds; see Chapter 9.) The addition of two milk servings and one meat serving will meet the need for increased calories as well as calcium and protein. Many women, however, do not eat a well-balanced diet prior to pregnancy. Also, some women are vegetarians and need to seek other alternatives for protein (see Health Promotion Issue box on pages 152 and 153). The nurse must provide these women with more in-depth information or refer them to a dietitian. Many health care providers prescribe a daily multiple vitamin with calcium and iron. Table 6-5 identifies a food guide to meet the nutritional needs of both the woman and the developing fetus.

**TABLE 6-4**

<table>
<thead>
<tr>
<th>DISCOMFORT</th>
<th>CAUSE</th>
<th>INTERVENTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Varicose veins</td>
<td>Pressure from enlarged uterus on deep pelvic veins</td>
<td>Rest with feet elevated</td>
</tr>
<tr>
<td></td>
<td>Relaxation of vessel walls due to progesterone</td>
<td>Avoid restrictive clothing, crossing legs</td>
</tr>
<tr>
<td></td>
<td>Inactivity, long periods of sitting or standing</td>
<td>Wear support hose</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Daily activity (walking)</td>
</tr>
<tr>
<td>Ankle edema</td>
<td>Inactivity, long periods of sitting or standing</td>
<td>Daily activity (walking)</td>
</tr>
<tr>
<td></td>
<td>Sodium retention</td>
<td>Rest with feet elevated</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Avoid salty foods</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If edema increases or is routinely present upon arising, contact health care provider</td>
</tr>
<tr>
<td>Leg cramps</td>
<td>Calcium/phosphorus imbalance</td>
<td>Increase calcium in diet</td>
</tr>
<tr>
<td></td>
<td>Muscle fatigue/strain</td>
<td>Frequent rest periods with legs elevated</td>
</tr>
<tr>
<td></td>
<td>Restricted circulation</td>
<td></td>
</tr>
<tr>
<td>Backache</td>
<td>Relaxation of pelvic joints</td>
<td>Rest lying on side</td>
</tr>
<tr>
<td></td>
<td>Exaggerated lordosis due to change in center of gravity</td>
<td>Wear low-heeled shoes</td>
</tr>
<tr>
<td></td>
<td>Fatigue</td>
<td>Use proper body mechanics</td>
</tr>
<tr>
<td></td>
<td>Poor body mechanics</td>
<td></td>
</tr>
<tr>
<td>Urinary frequency</td>
<td>Pressure of enlarging uterus on bladder</td>
<td>Empty bladder frequently</td>
</tr>
<tr>
<td></td>
<td>Urinary tract infection</td>
<td>Do NOT limit fluids</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Contact health care provider if other signs of urinary infection are present</td>
</tr>
<tr>
<td>Dyspnea</td>
<td>Decreased lung capacity due to pressure of enlarged uterus on diaphragm</td>
<td>Lie on side or semi-Fowler’s position</td>
</tr>
<tr>
<td>Vaginal discharge</td>
<td>Increased vaginal secretions due to estrogen</td>
<td>Practice good hygiene</td>
</tr>
<tr>
<td></td>
<td>Vaginal infection</td>
<td>If other signs of vaginal infection are present, contact health care provider</td>
</tr>
<tr>
<td>Itchy skin</td>
<td>Dehydration</td>
<td>Increase fluids</td>
</tr>
<tr>
<td></td>
<td>Stretching skin</td>
<td>Avoid drying soaps</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Apply lotion</td>
</tr>
<tr>
<td>Mood swings</td>
<td>Hormonal change</td>
<td>Express fears, concerns</td>
</tr>
<tr>
<td></td>
<td>Fatigue</td>
<td>Adequate diet and fluids</td>
</tr>
<tr>
<td></td>
<td>Inadequate diet</td>
<td>Adequate rest periods</td>
</tr>
</tbody>
</table>

**Common Discomforts of Pregnancy and Treatment (continued)**

**DISCOMFORT**
**CAUSE**
**INTERVENTION**

Varicose veins
Pressure from enlarged uterus on deep pelvic veins
Relaxation of vessel walls due to progesterone
Inactivity, long periods of sitting or standing

Ankle edema
Inactivity, long periods of sitting or standing
Sodium retention

Leg cramps
Calcium/phosphorus imbalance
Muscle fatigue/strain
Restricted circulation

Backache
Relaxation of pelvic joints
Exaggerated lordosis due to change in center of gravity
Fatigue
Poor body mechanics

Urinary frequency
Pressure of enlarging uterus on bladder
Urinary tract infection

Dyspnea
Decreased lung capacity due to pressure of enlarged uterus on diaphragm

Vaginal discharge
Increased vaginal secretions due to estrogen
Vaginal infection

Itchy skin
Dehydration
Stretching skin

Mood swings
Hormonal change
Fatigue
Inadequate diet
Adequate fluid intake is important for the pregnant woman. Drinking 1.5 to 2 L of water, milk, or juice every 24 hours is recommended. It is best to limit caffeine-containing beverages. Women in low socioeconomic levels may have difficulty buying adequate amounts of milk and high protein foods. These women should be referred for aid. Programs such as WIC may provide help (see Table 2-1).

**Exercise**

Exercise is increasingly recognized as an important part of a health maintenance program. Healthy, active women are more likely to have healthy infants. Women who are overweight and sedentary are more likely to encounter problems in themselves, such as gestational diabetes, and in their children (see Chapter 9). It is important to maintain activity throughout pregnancy. However, modifications should be made to adapt exercise to the physical changes pregnancy causes and the demands it makes on the body. Figure 6-19 illustrates some simple exercises that help relax muscles and prepare the body for childbirth.

**Kegel Exercises**

Kegel exercises are promoted during the prenatal period. These exercises help women identify muscles groups that are affected by delivery and that need conditioning after birth. Figure 6-20 shows the effect of Kegel exercise on the pubococcygeus muscle; it also shows the muscles of the pelvic floor. To identify the muscles of the pelvic floor, some nurses suggest stopping urination in midstream. However, it is not recommended to perform the exercise while urinating.

The woman is asked to visualize the pelvic floor muscles as an elevator. In relaxed position, the muscles are on the “ground floor.” Then the woman draws the muscles in and up, raising the “elevator” to the first, second, third, and fourth “floor.” She holds the muscles in that position, then gradually allows them to return to starting position.

Kegel exercises can be done while standing, sitting, or lying down. Some women use visual cues (e.g., standing in a grocery line, stopping for a red light) to remind them to do Kegel exercises. If properly done, the exercise does not engage the muscles of the thigh or buttocks. It is important to emphasize the importance of full, smooth breaths during the exercise.

**Avoiding Hyperthermia**

The pregnant woman, in part due to increased blood volume, has an increased tendency toward hyperthermia. Although women generally may continue the types of exercise they did before pregnancy, they will need to make adjustments in the intensity and duration of exercise. Many women are advised to avoid sports such as jogging and tennis that can put excessive strain on joints. Walking and swimming are often recommended to promote circulation and muscle tone. Swimming is especially good because water provides support while the aerobic workout occurs.

(Text continues on p. 155.)

---

**TABLE 6-5**

<table>
<thead>
<tr>
<th>FOOD GROUP</th>
<th>SERVING SIZE</th>
<th>DURING PREGNANCY</th>
<th>DURING LACTATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain products (whole-grain</td>
<td>1 slice bread</td>
<td>6–11</td>
<td>6–11</td>
</tr>
<tr>
<td>breads, cereals, pasta, rice)</td>
<td>1/2 bun, bagel</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1/2 cup cereal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetables (dark green</td>
<td>1 cup leafy greens</td>
<td>3–5</td>
<td>3–5</td>
</tr>
<tr>
<td>leafy, deep yellow, dry</td>
<td>1/2 cup all others</td>
<td></td>
<td></td>
</tr>
<tr>
<td>beans/peas)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fruits (citrus fruits and</td>
<td>1 medium apple, banana,</td>
<td>2–4</td>
<td>2–4</td>
</tr>
<tr>
<td>others)</td>
<td>1/2 cup canned</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1/2 cup juice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meat/poultry/fish</td>
<td>1/2 cup cooked dry beans</td>
<td>Up to 6 oz total</td>
<td>Up to 6 oz total</td>
</tr>
<tr>
<td>Beans/nuts/eggs (limit peanut</td>
<td>1 egg, 1/2 tbsp peanut</td>
<td></td>
<td></td>
</tr>
<tr>
<td>butter and nuts due to fat</td>
<td>butter = 1 oz meat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>content)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trim fat, remove skin from</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>poultry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milk and milk products</td>
<td>1 cup milk or yogurt</td>
<td>3 or more</td>
<td>4 or more</td>
</tr>
<tr>
<td></td>
<td>1/2 oz cheese</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
HEALTH PROMOTION ISSUE

PREGNANCY AND VEGETARIANISM

The nurse is taking an initial history of a G2 P1, 29-year-old, married client who is 12 weeks pregnant. Her weight today is 135 pounds, and her height is 5’ 8”. The client works full-time as an accountant. She is concerned about her diet and reports taking her prenatal vitamins faithfully. She states that she does not have time to eat right, eats out frequently because her 3-year-old son loves fast food, and claims that she really cannot cook too well. She also states that she is a vegetarian, although her husband and her son are not. The nurse understands that there are several issues that need to be addressed with this client. She needs help with food choices and food preparation. She needs to be advised of the hazards of poor nutrition during pregnancy and its effect on her children’s health. It would also be helpful if she had some sample menus after which to model her diet.

DISCUSSION

Increasing the protein content to 60 to 80 g/day can be especially challenging for the pregnant vegetarian client. Added protein is essential to support the increased metabolic needs of pregnancy and to aid the growth of maternal and fetal tissues. Protein also aids increased energy levels, muscular contractions, and immunity. Lack of protein in the diet of a pregnant woman has been linked to increased incidence of low-birthweight infants, pregnancy-induced hypertension, and poor fetal brain development.

Nonanimal proteins are said to be incomplete proteins. Incomplete proteins do not contain all essential amino acids. However, the vegetarian can get these essential amino acids in her diet by combining complementary plant proteins. Examples of these combinations are beans and grains or dairy and grains. Many nonanimal foods provide good sources of protein such as chick peas, baked beans, tofu, cow or soy milk, cereals such as muesli, peanuts or peanut butter, and breads. Some vegetarians are not opposed to eggs in their diet.

The pregnant vegetarian woman also needs to be sure to get enough calcium and vitamin D in her diet. Choosing soy milk that is fortified with vitamin D will aid in meeting these needs. Prenatal vitamins should contain iron, vitamin B₁₂, zinc, and vitamin D.

Proper parental food choices and dietary restraint have been found to have a direct effect on childhood obesity. Fast-food meals are typically high in calories and have a high fat content. Parents who are intent on preventing obesity should avoid prepackaged foods, as well as foods high in sugar and fat. A child’s diet should contain less than 30% of calories from fat.

PLANNING AND IMPLEMENTATION

The nurse should help the client understand that proper planning and advanced preparation will aid in making proper food choices and, in the long run, will save time and energy. Encouraging her to create a detailed weekly menu and shopping list will prevent her from making unhealthy purchases. Explain to the pregnant client that her weekly food preparation will be aided if upon returning from the grocery store she prepares the food by slicing meats and cheeses, washing and cutting fruits and vegetables, and boiling eggs.

Mornings are typically difficult for working mothers of young children. Time demands rarely allow for meal planning and preparation. The nurse could encourage the client to fix lunches and begin the next night’s dinner preparation before bedtime. Following are several choices of easy-to-prepare vegetarian meals.

Because it is virtually impossible to avoid eating out in the fast-paced American society, the nurse should assist the client in making healthy choices.
<table>
<thead>
<tr>
<th>MENU 1</th>
<th>MENU 2</th>
<th>MENU 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Breakfast</strong></td>
<td><strong>Snack</strong></td>
<td><strong>Lunch</strong></td>
</tr>
<tr>
<td>One orange, whole wheat</td>
<td>Trail mix of raisins and</td>
<td>Steamed broccoli and</td>
</tr>
<tr>
<td>toast with peanut butter,</td>
<td>almonds, 20 oz water</td>
<td>asparagus with cheese,</td>
</tr>
<tr>
<td>1 cup low-fat yogurt, 20 oz</td>
<td></td>
<td>baked beans, two slices</td>
</tr>
<tr>
<td>water</td>
<td></td>
<td>whole wheat bread, 1 cup</td>
</tr>
<tr>
<td></td>
<td></td>
<td>noncaffeinated tea</td>
</tr>
<tr>
<td><strong>Snack</strong></td>
<td><strong>Snack</strong></td>
<td><strong>Snack</strong></td>
</tr>
<tr>
<td>Carrots and celery with</td>
<td>Apple slices with peanut</td>
<td>Whole wheat cereal such</td>
</tr>
<tr>
<td>cottage cheese</td>
<td>butter, crackers, 20 oz water</td>
<td>as Cheerios, cheese cubes,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>flax seeds, 20 oz water</td>
</tr>
<tr>
<td><strong>Dinner</strong></td>
<td><strong>Dinner</strong></td>
<td><strong>Dinner</strong></td>
</tr>
<tr>
<td>Veggie burger on whole</td>
<td>Stir fry of squash, zucchini,</td>
<td>Mushrooms, green pepper,</td>
</tr>
<tr>
<td>wheat bun with cheese,</td>
<td>slivered almonds, and tofu;</td>
<td>and onions, sautéed, and</td>
</tr>
<tr>
<td>lettuce, and tomato;</td>
<td>serving of brown rice, 1 cup</td>
<td>served over whole wheat</td>
</tr>
<tr>
<td>serving of brown rice, 1 cup</td>
<td>soy milk</td>
<td>pasta with cream sauce</td>
</tr>
<tr>
<td>soy milk</td>
<td></td>
<td>made with soy milk and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>mozzarella cheese; 1 cup</td>
</tr>
<tr>
<td><strong>Snack</strong></td>
<td><strong>Snack</strong></td>
<td>herbal tea</td>
</tr>
<tr>
<td>Banana, bran muffin, 1 cup</td>
<td>Mixed fruit cup, 10 oz water</td>
<td>Pure fruit sorbet with</td>
</tr>
<tr>
<td>herbal tea</td>
<td></td>
<td>graham crackers</td>
</tr>
</tbody>
</table>

when dining out. Fortunately, the majority of fast-food restaurants offer healthy, low-fat menu choices. Many restaurants offer a wide range of salads containing fresh vegetables, cheeses, and nuts. Combined with a low-fat salad dressing, this option makes a smart choice for the vegetarian. Some fast-food restaurants offer fruit cups, cole slaw, and yogurt parfaits. For the nonvegetarian, there are grilled chicken sandwiches and deli sandwiches on whole wheat breads.

**SELF-REFLECTION**

*Carefully assess your own nutritional habits. Record your intake for a 24-hour period. Determine excesses and deficiencies in your dietary and fluid intake. What is your weight? Is it appropriate for your height? What poor nutritional habits are you role modeling to your clients? Actions often speak louder than words.*

**SUGGESTED RESOURCES**

**For the Nurse**


**For the Client**


Figure 6-19. Prenatal exercises. (A) Tailor sitting. (B) Pelvic tilt on hands and knees: The woman arches her lower back and then relaxes it to a flat position. (C) Leg raises: To strengthen abdominal muscles, a pregnant woman may be taught to alternately raise one leg, then the other, from a bent position straight up off the floor as shown here.
Kegel exercises are often taught during pregnancy. They help the woman become familiar with muscles that support the pelvic floor. After birth, these exercises will be useful in regaining muscle tone. (A) Pubococcygeus muscle with poor tone. (B) Pubococcygeus muscle with good tone. (C) Muscles of the pelvic floor. (The puborectalis, pubovaginalis, and coccygeal muscles cannot be seen from this view.)

**SAFETY CONCERNS**

The home and work environment must be safe for the pregnant client. In late pregnancy, the woman is at risk for falls because her center of gravity has shifted. The home should be inspected for hazards, and any corrections should be made. Chemicals (including cleaning supplies, insecticides, and weed control agents) can harm the fetus. These chemicals should be avoided if possible. If the woman must use these chemicals, she should avoid skin contact and inhalation of fumes. Excessive heat from hot tubs, saunas, or hot humid weather should be avoided because water of 106°F can cause maternal hyperthermia (Rogers & Davis, 1995).

**PRENATAL TEACHING**

Every clinical visit is an opportunity for the nurse to provide prenatal teaching. The nurse can answer questions, offer new information, and reassure parents-to-be of things...
BOX 6-5 CLIENT TEACHING

**Health Promotion Topics During Pregnancy**

*Nutrition, Diet, and Exercise (affecting both mother and fetus)*
- Prenatal vitamins and/or foods to supply pregnancy needs
- Importance of fluids
- Hygiene, clothing adaptations, dental care
- Pattern of weight gain, desired weight gain (individualized teaching)
- Referral, if needed, to WIC program or other community assistance
- Alcohol's effects on the fetus
- Limiting or eliminating caffeine

**Safety**
- Adapting to body changes and changes in balance
  - Techniques for relieving physical stresses of pregnancy
- Checking all medications (even over-the-counter) with physician before use
- Smoking cessation

- Pets (especially cats because of the potential for being infected with toxoplasmosis when handling cat feces)
- Toxins and exposure to dangerous chemicals in the home and environment

**Work**
- Learning to balance work and rest
- Adaptations to jobs requiring long periods of standing

**Travel Considerations**
- Car travel—seatbelt adjustment
- Air travel—restrictions

**Prenatal Classes**
- Physical and mental preparation for childbirth and parenting
- Effects of pregnancy on sexuality
- Awareness of possible complications requiring medical aid
- Value of prenatal health care visits
- Planning for effects of pregnancy on home life

They are doing right. Office visits are an opportunity to review the importance of good nutrition, regular exercise, and adequate rest. Most women are open to learning about health promotion in this period of their lives. This gives the nurse the chance to encourage steps toward a healthier lifestyle that can have long-term effects. Some important areas of client teaching during pregnancy are listed in Box 6-5.

**Prenatal Classes**

Prenatal classes are advisable for all mothers, not just those in their first pregnancies. Topics that are generally covered in these classes are:
- Health considerations during pregnancy, including:
  - Nutrition, diet, and exercise
  -Pets (especially cats because of the potential for being infected with toxoplasmosis when handling cat feces
- Overview of the labor process
- Signs that labor is beginning
- Contraction patterns and timing
- Breathing techniques to assist the woman through contractions
- Chemical and nonchemical methods of providing pain relief during labor
- Possible complications in the mother and their warning signs
- Possible complications of labor, including emergency cesarean delivery and fetal anomaly or death
- Infant feeding (breast or bottle, positions, burping; see Chapter 9)

- Infant care (diapering, dressing, bathing)
- Infant safety (see Chapter 12)
- Siblings
- Work and travel considerations during pregnancy.

**Adolescent Parents**

It can be beneficial to provide prenatal classes specifically for pregnant teens. An all-teens class (Figure 6-21) can offer a safe environment in which to discuss impending parenthood. Issues such as altered self-image can be much more difficult for adolescents to handle than for adults. There may be resentment about having life plans interrupted by the pregnancy. There may be issues about parental criticism that need to be aired, or disagreement over who will raise the child after birth. In a peer
environment, teens can express their views more openly and can receive support from others who share their situation.

**MONITORING FOR COMPLICATIONS**

The client should be taught warning signs of possible complications. Usually, the sooner interventions are begun, the better the outcome. Signs of impending labor should be discussed with the client in the mid-second to third trimester of pregnancy. Table 6-6 identifies warning signs.

Complications and high-risk pregnancy are discussed in Chapter 8.

**TABLE 6-6**

<table>
<thead>
<tr>
<th>WARNING SIGN (Need immediate medical evaluation)</th>
<th>POSSIBLE CAUSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaginal bleeding (any)</td>
<td>Spontaneous abortion, placenta previa, abruptio placenta</td>
</tr>
<tr>
<td>Fluid gushing or leaking from vagina</td>
<td>Rupture of membranes (leaking urine may appear similar)</td>
</tr>
<tr>
<td>Persistent vomiting</td>
<td>Hyperemesis gravidarium</td>
</tr>
<tr>
<td>Swelling of hands, face, legs, feet</td>
<td>Pregnancy-induced hypertension (PIH), pre-eclampsia</td>
</tr>
<tr>
<td>Visual disturbance: blurred vision, double vision, seeing spots or flashes of light</td>
<td>PIH, pre-eclampsia</td>
</tr>
<tr>
<td>Dizziness, fainting, persistent headache</td>
<td>PIH, pre-eclampsia</td>
</tr>
<tr>
<td>Fever over 100°F (37.8°C) and chills</td>
<td>Infection</td>
</tr>
<tr>
<td>Abdominal pain, cramping</td>
<td>Ectopic pregnancy, spontaneous abortion, abruptio placenta, labor</td>
</tr>
<tr>
<td>Thick, white/yellow, irritating vaginal discharge</td>
<td>Vaginal infection</td>
</tr>
<tr>
<td>Dysuria</td>
<td>Urinary infection</td>
</tr>
<tr>
<td>Oliguria</td>
<td>Dehydration, PIH</td>
</tr>
<tr>
<td>Notable decrease or absence of fetal movement</td>
<td>Fetal distress, fetal death</td>
</tr>
</tbody>
</table>

**Birthing Facilities and Staff**

The settings in which women give birth are varied. Women may go to a local hospital and deliver the baby in a delivery room. They may choose a maternity center where labor and birth occur in a homelike atmosphere. A few elect to deliver their babies at home.

As care providers, women may have a physician, a nurse midwife, or a doula (a supportive companion who accompanies the woman through birth, providing physical and emotional support and information, and advocating for the woman and the family). The obstetrician, although no longer the sole person assisting births, is on call to other caregivers in case of emergency.

**NURSING CARE**

**PRIORITIES IN NURSING CARE**

The highest priority in providing prenatal care is monitoring the mother and fetus for signs of complications. Any such signs must be reported immediately. Teaching the mother, father, and significant others what to expect during pregnancy is important in health maintenance and preparation for childbirth. The nurse must be prepared to provide instruction at every client contact.

**ASSESSING**

The assessment of the pregnant family includes collecting physical data, determining the psychological response to pregnancy, and evaluating family functioning. An important piece of data to collect is information about the woman’s culture and cultural expectations related to pregnancy.

**Cultural Considerations**

Families are influenced by their cultures, perhaps especially during times of great change, such as marriage, death, and birth. The nurse must be open to and respectful of their beliefs. Language barriers may pose a challenge in providing client and family teaching. Therefore, it is important to have an interpreter available when possible. Printed material should also be available in the woman’s language. Table 6-7 presents activities encouraged or avoided by some cultures.

**Initial Visit**

- Provide a pleasant environment and therapeutic listening skills. Use open-ended questions when inquiring about the effect of the pregnancy on the woman’s life. The pregnant woman will have positive or negative feelings about the pregnancy. For her to feel safe about expressing them, the nurse’s feeling about pregnancy must not affect the interview. The client and her needs are the focus. There may be a difference of opinion between the woman and her partner. The nurse assists by providing a place in which issues can be raised. In the case of difficult
family issues, the nurse would bring in a qualified social worker or counselor.

- A health history will be obtained (in depth, if necessary), including menstrual history and history of past pregnancies. The LPN/LVN will assist the RN in collecting data. A complete health history is needed to identify any past medical issues that might affect the pregnancy. A history of past pregnancies is important because labor time is usually significantly reduced after the first delivery (see Chapter 7). History of abortion, whether elective or spontaneous, is recorded at this time. Important precautions would be instituted for a woman wanting children who has had spontaneous abortion in the past (see Chapter 8). Review Table 6-2 for the proper terms to use in describing a woman’s parous state.

- Assist with an in-depth physical assessment. The health care provider will perform a detailed assessment of the reproductive organs. An ultrasound may be done to diagnose pregnancy. Blood may be drawn to determine a baseline for future reference.

### Table 6-7: Activities Encouraged or Avoided by Some Cultures During Pregnancy

<table>
<thead>
<tr>
<th>TOPIC</th>
<th>BELIEF</th>
<th>NURSING CONSIDERATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nutrition</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Italian descent</td>
<td>Desire for certain foods must be satisfied to prevent congenital anomalies. Also, they must smell the food to prevent miscarriage. (Spector, 2000)</td>
<td>Obtain a diet history. Discuss need for well-balanced diet during pregnancy. If the dietary practice is not harmful, there is no reason to ask the client to discontinue the practice.</td>
</tr>
<tr>
<td>African descent</td>
<td>Eat clay, dirt, or starch to benefit mother and fetus. (Spector, 2000)</td>
<td></td>
</tr>
<tr>
<td>Korean descent</td>
<td>Practice Tae Kyo, rules for safe childbirth, which lists food taboos. (Choi, 1995)</td>
<td></td>
</tr>
<tr>
<td><strong>Exercise</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Italian descent</td>
<td>Fear that moving in certain ways can cause fetal anomalies. (Spector, 2000)</td>
<td>Obtain exercise history. Ask client if there are activities she is afraid to do because of the pregnancy. Assure her that reaching over her head will not harm the baby. Help her identify safe forms of activity. Teach need for activity related to general health and weight control.</td>
</tr>
<tr>
<td>Southeast Asian descent</td>
<td>Inactivity during pregnancy results in difficult labor. (Mattson, 1995)</td>
<td></td>
</tr>
<tr>
<td><strong>Home remedies</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Native American descent</td>
<td>May use herbal remedies (milky juice from dandelion to increase breast milk). (Spector, 2000)</td>
<td>Obtain exercise history. Ask client if there are activities she is afraid to do because of the pregnancy. Assure her that reaching over her head will not harm the baby. Help her identify safe forms of activity. Teach need for activity related to general health and weight control.</td>
</tr>
<tr>
<td>Chinese descent</td>
<td>Drink ginseng tea for faintness. Adding bamboo leaves will have sedative effect.</td>
<td>Many clients fail to report use of home remedies for fear of being judged unfavorably. When obtaining a health history, ask about home remedies. Teach that some herbs can be harmful when taken with prescribed medication.</td>
</tr>
<tr>
<td>African descent</td>
<td>Self-medicate for common discomforts of pregnancy (take laxatives to prevent/treat constipation).</td>
<td></td>
</tr>
<tr>
<td><strong>Spirituality</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Native American descent</td>
<td>May use the “medicine man” to ensure safe birth and healthy baby. Tribal spiritual leaders may be invited by family to attend birth, pray, and perform “ceremonies.”</td>
<td>Encourage the use of support systems. Be sensitive to “tribal ceremonies” as long as they do not disrupt others.</td>
</tr>
<tr>
<td>Korean descent</td>
<td>Practice Tae Kyo, rules for safe childbirth, which lists food taboos. (Choi, 1995)</td>
<td></td>
</tr>
<tr>
<td><strong>Alternate health care providers</strong></td>
<td>Women of many cultures may choose to use alternative health care providers.</td>
<td></td>
</tr>
<tr>
<td>Mexican descent</td>
<td>May seek care from a partera (midwife). The partera can speak their language, understands the culture, and may deliver the infant in the home or possibly at a birthing center. (Spector, 2000)</td>
<td>Discuss a variety of health care provider choices. Help the client explore the risks and benefits of different prenatal care and delivery settings. Provide reassurance that the goal is a healthy mother and the delivery of a healthy baby with respect for the client’s beliefs. Note: Some midwives are RNs with advanced education and certification, whereas others are lay midwives with little or no formal education. During a home delivery, equipment may not be available during an emergency.</td>
</tr>
<tr>
<td>Native American descent</td>
<td>Use herbal remedies (milky juice from dandelion to increase breast milk). (Spector, 2000)</td>
<td></td>
</tr>
<tr>
<td><strong>Obtain a diet history. Discuss need for well-balanced diet during pregnancy. If the dietary practice is not harmful, there is no reason to ask the client to discontinue the practice.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obtain exercise history. Ask client if there are activities she is afraid to do because of the pregnancy. Assure her that reaching over her head will not harm the baby. Help her identify safe forms of activity. Teach need for activity related to general health and weight control.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Many clients fail to report use of home remedies for fear of being judged unfavorably. When obtaining a health history, ask about home remedies. Teach that some herbs can be harmful when taken with prescribed medication.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Encourage the use of support systems. Be sensitive to “tribal ceremonies” as long as they do not disrupt others.</td>
<td></td>
<td></td>
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<td>Discuss a variety of health care provider choices. Help the client explore the risks and benefits of different prenatal care and delivery settings. Provide reassurance that the goal is a healthy mother and the delivery of a healthy baby with respect for the client’s beliefs. Note: Some midwives are RNs with advanced education and certification, whereas others are lay midwives with little or no formal education. During a home delivery, equipment may not be available during an emergency.</td>
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discomforts. Inquire about how the woman and the family are coping with the pregnancy. Provide client teaching related to gestational changes and ways of monitoring the fetus between visits. Data must be monitored throughout the woman’s pregnancy. Client teaching is a regular part of each prenatal visit. Open-ended questions about how the woman and family are responding to the pregnancy allow the woman to bring issues forward for discussion.

- Assist RN or collect data on the FHR (see Figure 6-16). Once audible, the FHR is a useful indicator of fetal health.
- Inquire about any medications, over-the-counter drugs, herbal remedies, or recreational drugs the woman may be using. Encourage the woman to take prenatal vitamins as prescribed. The nurse should collect information about all types of drugs and preparations and should report any unusual or potentially harmful drugs to the care provider. Client teaching should include information about safe and unsafe chemicals. (Review Box 6-3.) Prenatal vitamins help ensure a healthy fetus.
- Report a blood pressure increase of 30 mm Hg systolic and 20 mm Hg diastolic over previous measurement to the health care provider. If a previous blood pressure measurement is not available, report a recording of 140/90. A rise in BP could indicate pregnancy-induced hypertension.
- Track the woman’s weight from visit to visit (Figure 6-22). A total weight gain should be 25 to 35 pounds,
with the most rapid weight gain occurring during the last half of the pregnancy. From weeks 1 to 12, the client should gain 3 to 4 pounds. From weeks 13 to 40, she should gain 1 pound per week. A weight gain of less than this could indicate poor nutrition and low fetal growth. A weight gain of more than this could indicate improper nutrition or fluid retention.

- Measure the height of the fundus in centimeters above the pubis. Compare this measurement to previous measurements and the weeks of gestation (Figure 6-23). The fundus should enlarge 1 cm/week. If the fundus is not enlarging at this rate, the fetus is not growing at a normal rate. The fundus

enlarging more than this rate would indicate that the fetus is growing too rapidly or that a multiple pregnancy is suspected. From 20 to 36 weeks, the fundal measurement is normally 2 centimeter + /− the number of weeks gestation. So, for example, at 24 weeks' gestation, fundal measurement should be 22 to 26 centimeter.

- Monitor for edema. A small amount of dependent edema is often present in the last few weeks of pregnancy. A large amount of edema in the feet, or edema of the calves, thighs, hands, and face, should be reported to the health care provider.

- Collect a urine sample at each visit and perform a dipstick tested for glucose, protein, and ketone bodies. A glucose screening test is ordered in weeks 24 to 28 to determine the presence of gestational diabetes. The urine test will allow early intervention if needed. The glucose test establishes a diagnosis and allows the mother to take action to promote maximum well-being for herself and the fetus. (Review Table 6-3 for normal lab values during pregnancy.)

DIAGNOSING, PLANNING, AND IMPLEMENTING

In planning nursing interventions for the prenatal client, the nurse should consider the woman's knowledge, past experiences, behaviors that increase risk, family support system, and socioeconomic status. Most nursing interventions involve teaching or anticipatory guidance. Specific topics and time frames depend on when prenatal care is begun and on complications. Nursing diagnosis might include:

- Anxiety
- Body Image Disturbance
- Constipation
- Fatigue
- Family Coping: Potential for Growth
- Fear
- Deficient Fluid Volume
- Imbalanced Fluid Volume
- Injury, Risk for
- Deficient Knowledge (specify)
- Nutrition: Altered, Less Than Body Requirements
- Physical Mobility, Impaired
- Sexual Dysfunction
- Sleep Pattern Disturbance

Some suggested outcomes for clients might include:

- Client exhibits no signs of fluid excess or fluid deficit.
- Client verbalizes understanding of teaching.
- Client verbalizes consuming a balanced diet.
- Client verbalizes she sleeps for 6 to 8 hours every night.

One of the main functions of the nurse is educating the client and her family about the pregnancy process and
If necessary, refer the woman to programs that can supply

- Encourage good nutrition and moderate, regular exercise.

- Encourage the taking of prenatal multivitamins once a day, even if the client is nauseous. Suggest that she adjust the time of day she takes the vitamin so she will be able to continue taking the supplement. If she is unable or unwilling to use prenatal vitamins, provide a list of foods that are high in nutrients that pregnant women need (see Box 6-1). Most care providers prescribe a prenatal multivitamin with iron to be taken once a day. This nutritional supplement will help ensure that adequate amounts of vitamins and iron are ingested for the developing fetus.

- Encourage good nutrition and moderate, regular exercise. Remind the woman to drink plenty of fluids. Provide suggestions for discomforts associated with pregnancy (Box 6-6 ■; review Table 6-4). Good nutrition and regular exercise can help the woman overcome some of the discomforts of pregnancy. It is recommended that pregnant women drink 1.5 to 2 liters of fluid per day and that caffeine intake be limited.

- If necessary, refer the woman to programs that can supply milk and protein. Some women may not be able to afford the extra high-calcium and high-protein foods that are useful when pregnant. Assistance programs are available to help provide these nutrients.

- Remind the woman to consult a physician before taking cold, headache, allergy, flu, or other medications or supplements. Many physicians, nurse midwives, and nurse practitioners provide their clients with a list of over-the-counter medications that are acceptable for use during pregnancy.

- Review safety hazards for pregnant women and encourage them to take them seriously. Women in late pregnancy are at risk for falls. Exposure to chemicals may harm the fetus. Excessive heat can cause maternal hyperthermia.

- Encourage the client to make and keep regularly scheduled appointments throughout the prenatal period. The pregnant woman should return every 4 weeks for the first 28 weeks, every 2 weeks during weeks 29 to 36, and every week thereafter until delivery.

- Teach the client warning signs of possible complications (see Table 6-6). Discuss signs of impending labor with the client in the third trimester. Usually, the sooner interventions are begun, the better. Giving the woman information allows her to relax when there are no warning signs and to report them promptly if they should occur. Prompt attention may prevent complications.
Client Self-Care
Self-care generally involves a minimal adjustment of normal habits.

- Advise the woman to review the employment environment, and to discuss areas of concern with the health care provider. The decision to continue employment should be based on several factors. Are there hazards in the workplace that would place additional risk on the pregnancy? Would the woman be under undue physical strain? Would periods of rest be available?
- Teach that sexual activities may continue throughout the pregnancy. There may be a change in desire for sexual activity during pregnancy. After the sixth month, the woman should not lie flat on her back due to hypotensive syndrome. A pillow can be placed under her right hip, or an alternative position can be used.
- Advise women to continue dental care on a regular schedule, and to use low-heeled shoes for everyday wear. Because maternity clothing is only worn for a short time, clothing may be shared among friends, or second-hand clothing may be purchased at reasonable prices. Knee-high or thigh-high stockings can interfere with circulation. Low-heeled shoes are generally recommended due to the difficulty of maintaining balance in high-heeled shoes.
- Encourage continued activity and periods of rest. The pregnant woman should have regular activity. Activities routinely practiced before pregnancy can generally be continued as long as there are no complications and the woman can safely participate. Walking and swimming are best, and overly strenuous activity should be avoided. Fatigue should also be avoided. Periods of rest, with the legs elevated to promote venous return, should be scheduled throughout the day.
- Discuss the importance of clothing for the self-image and comfort during pregnancy. Clothing that is attractive, loose fitting, and easy to care for should be selected. Teach client to steer away from stockings that constrict at knees or thighs and to choose low-heeled shoes for everyday wear. Because maternity clothing is only worn for a short time, clothing may be shared among friends, or second-hand clothing may be purchased at reasonable prices. Knee-high or thigh-high stockings can interfere with circulation. Low-heeled shoes are generally recommended due to the difficulty of maintaining balance in high-heeled shoes.
- Advise women to continue dental care on a regular schedule, but not to have x-rays during pregnancy. The woman should inform her dentist that she is pregnant. Dental care is necessary for ongoing good health. X-ray examinations should be postponed until after the pregnancy because of the risk of radiation to the fetus.
- Teach that sexual activities may continue throughout the pregnancy unless there are complications. There may be a change in desire for sexual activity during pregnancy. After the sixth month, the woman should not lie flat on her back due to hypotensive syndrome. A pillow can be placed under her right hip, or an alternative position can be used.
- Advise the woman to review the employment environment in terms of her needs while pregnant and to discuss areas of concern with the health care provider. The decision to continue employment should be based on several factors. Are there hazards in the workplace that would place additional risk on the pregnancy? Would the woman be under undue physical strain? Would periods of rest be available?
- Discuss effect of pregnancy on travel. Travel need not be restricted unless complications develop. Generally, the best time to travel is in the second trimester, when the risks of complications are less. Some airlines may not accept passengers past a certain week of pregnancy without a provider's note. When traveling, the woman should walk for about 10 minutes every 2 hours to prevent venous stasis. The seat belt should be worn snugly below the abdomen.
- Encourage the woman to attend childbirth education classes. Preparation for childbirth usually begins in the third trimester. Many hospitals and birthing centers present childbirth classes. Women should be encouraged to attend these classes so they will be well prepared both mentally and physically. Printed resources are also available to assist in childbirth preparation.

EVALUATING
Clients should be able to verbalize an understanding of the instructions. A change, or lack of change, in client’s behavior is also used to evaluate the instruction provided. Although the majority of pregnancies are completed with a minimum of discomfort, complications can occur at any time. It is the role of the LPN/LVN to assist in data collection and to report any signs of complications. Chapter 10 describes the most common complications and the related nursing care.

NURSING PROCESS CARE PLAN
Caring for Pregnant Woman Who Wants to Travel

Mrs. Taylor, expecting her first baby, comes to the clinic for a routine visit. She is 22 weeks pregnant and states that she is feeling well and that the baby is becoming very active. She states that she wants to go on a trip with her husband in a few weeks. She also states that she is getting not only excited about labor, but also a little scared.

Assessment
- BP 134/72
- Negative protein in urine
- No edema in ankles
- Weight increase by 1½ pounds in last month

Nursing Diagnosis. The following important nursing diagnosis (among others) is established for this client:
- Deficient Knowledge related to travel during pregnancy and childbirth
Expected Outcomes. The mother will verbalize an understanding of travel guidelines, symptoms of complications, and ways to access health care.

Planning and Implementation
■ Discuss travel at this point of the pregnancy, including need for exercise and fluids. Provide information regarding signs of complications and how to access health care if needed.
■ Provide information regarding childbirth education classes in the area.
■ Schedule a return visit to clinic in 1 month.

Evaluation. Pregnancy progressing in a normal pattern. Mrs. Taylor should verbalize signs of complications and when to contact health care provider. She should be able to begin childbirth education classes.

Critical Thinking in the Nursing Process
1. What are some other topics that should be discussed with Mrs. Taylor at this point of the pregnancy? (Hint: Think about changing body shape and safety.)
2. What topics should the nurse plan to discuss at the next appointment in 1 month?
3. What is the role of the LPN/LVN in providing care to the pregnant client in a physician’s office?

Note: Discussion of Critical Thinking questions appears in Appendix I.

Note: The references and resources for this and all chapters have been compiled at the back of the book.
Chapter Review

KEY TERMS by Topic

Use the audio glossary feature of either the CD-ROM or the Companion Website to hear the correct pronunciation of the following key terms.

**Preconception**
craniofacial, anomalies, teratogens, salpingitis

**Fertilization**
fertilization, pregnancy, conception, zygote, morula, blastocyst, trophoblast, embryonic disc, implantation, villi, human chorionic gonadotropin (hCG)

**Development of Support Structures**
chorion, amnion, fetal membranes, “bag of waters,” amniotic fluid, lanugo, vernix caseosa, placenta, cotyledons, human placental lactogen (hPL), relaxin, umbilical cord, Wharton’s jelly

**Stages of Fetal Development**
gestation, pre-embryonic stage, embryonic stage, fetal stage

**Development of Fetal Body Systems**
cephalocaudal, umbilical arteries, umbilical vein, ductus venosus, foramen ovale, ductus arteriosus, yolk sac, surfactant, viability, meconium, ossification

**Signs of Pregnancy**
presumptive signs, amenorrhea, quickening, pseudopregnancy, ballottement, Hegar’s sign, Goodell’s sign, Chadwick’s sign, fetal heart tones (FHT), uterine soufflé, funic soufflé

**Maternal Changes During Pregnancy**
trimesters, Braxton Hicks contractions, colostrum, supine hypotensive syndrome, physiologic anemia of pregnancy, hyperemesis gravidarum, linea nigra, chloasma, striae gravidarum, oxytocin, “let-down reflex”

**Diagnostic Tests of Fetal Status**
ultrasound, amniocentesis, percutaneous umbilical cord sampling, erythroblastosis fetalis, chorionic villus sampling, nonstress test (NST), biophysical profile

**Initial Visit**
gravida, para, abortion, preterm, term, postterm, miscarriage, Naegele’s rule, nulligravida, nullipara, primagravida, primapara, multigravida, multipara, GP/TPAL

**Follow-up Visits**
abortifacients

**Birth Facilities and Staff**
doula

KEY Points

- During fetal development, all body systems are formed in the first 8 weeks.
- Most pregnancies progress as planned. The LPN/LVN is responsible for collecting data and for recognizing and reporting symptoms of complications.
- The key to a healthy pregnancy is regular prenatal care, including client teaching and early detection of complications.
- Nurses have a responsibility to teach good health practices, including nutrition, exercise, and eliminating risky behaviors.

EXPLORE MediaLink

Additional interactive resources for this chapter can be found on the Companion Website at www.prenhall.com/towle. Click on Chapter 6 and “Begin” to select the activities for this chapter.

For chapter-related NCLEX-style questions and an audio glossary, access the accompanying CD-ROM in this book.

Animations
Pre-eclampsia
Ectopic pregnancy

FOR FURTHER Study

Table 2-1 lists some frequently accessed government programs for women and young children.

Chapter 4 reviews reproductive anatomy; Figure 4-12 shows structures of the uterus; Figure 4-17 illustrates the process of lactation.

See in-depth discussion of reproductive issues and STIs in Chapter 5; Figure 5-18 shows fraternal vs identical twins.

The procedure for performing an external fetal heart monitor reading during labor and delivery is in Chapter 7.

High-risk pregnancies and procedures are discussed in Chapter 8.

Fetal alcohol syndrome is discussed in Chapters 8 and 27.

Chapter 9 discusses newborn care and nutrition.

Chapter 10 includes postpartum complications.

Chapter 12 reviews health promotion and safety issues.

Down syndrome is discussed in Chapter 16.

Fetal and newborn circulation is illustrated in Figure 19-1.

Renal disorders are discussed in detail in Chapter 23.
**Caring for an Undernourished Pregnant Woman**

**NCLEX-PN® Focus Area: Physiologic Integrity**

**Case Study:** Jean, a 17-year-old, comes to the clinic for her first visit. She appears pale and thin. Her weight is 135 lb. Her vital signs are within normal limits. Her urine is negative for protein. It is determined she is 10 weeks pregnant. She states that she is living with her boyfriend in a one-bedroom basement apartment. Both Jean and her boyfriend have had to drop out of high school to get jobs. They are barely able to pay the rent and buy food. Jean begins to cry, stating that she does not know what to do.

**Nursing Diagnosis:** Imbalanced Nutrition: Less than Body Requirements

### COLLECT DATA

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Would you report this? Yes/No
If yes, to: ______________________________________

### Data Collected

(Use those that apply)
- Crying
- States she does not know what to do
- Weight: 135 lb
- Vital signs
- Urine negative for protein
- Pale
- Thin
- Money only for rent and food

### Nursing Interventions

(Use those that apply; list in priority order)
- Teach need for milk products.
- Refer to WIC program.
- Teach need for increased protein, lower carbohydrates in diet.
- Teach need for prenatal vitamins.
- Refer to therapist for depression.

### Nursing Care

- ____________________________________________
- ____________________________________________
- ____________________________________________
- ____________________________________________
- ____________________________________________
- ____________________________________________

How would you document this?
__________________________________________
__________________________________________
__________________________________________

Compare your documentation to the sample provided in Appendix I.
1. After fertilization of the ova, when does the production of hCG begin?
   1. 8–12 hours
   2. 18–36 hours
   3. 4–6 days
   4. 8–10 days

2. Which of the following substances produced by the placenta prevents uterine contractions?
   1. human placental lactogen
   2. human chorionic gonadotropin
   3. progesterone
   4. relaxin

3. Which of the following statements about fetal circulation are true? Choose all that apply.
   1. The fetal respiratory system oxygenates blood.
   2. The ductus arteriosus is located inside the fetal heart.
   3. Osmosis is the means of blood exchange between placenta and fetus.
   4. The umbilical cord contains two arteries and one vein.
   5. The fetal blood and maternal blood do not mix.

4. The nurse, working with a pregnant woman who was eating a well-balanced diet prior to pregnancy, will advise this woman to:
   1. Make no changes in her diet.
   2. Add two milk and one meat servings.
   3. Add two vegetable and one fruit servings.
   4. Decrease the amount of carbohydrates.

5. The nurse, working with a pregnant woman in the last trimester, will advise the woman to sleep on her side mainly to:
   1. relieve pressure on the bladder.
   2. relieve pressure on the fetus.
   3. facilitate sleep.
   4. prevent hypotension.

6. The earliest the nurse will be able to hear the fetal heart tones by using a Doppler is by week number:
   1. 2
   2. 6
   3. 10
   4. 20

7. You are trying to determine the estimated date of delivery for a client whose last menstrual period began on May 6 and ended on May 11. The estimated date of delivery using Naegele’s rule is which of the following dates in February?
   1. 6
   2. 11
   3. 16
   4. 18

8. Maria, a 17-year-old single woman, is 12 weeks pregnant. She says to the nurse, “I don’t want to be pregnant. How can I take care of a baby and still do all the things I want?” The nurse should reply,
   1. “I can make you an appointment for an abortion.”
   2. “You should have thought about that before you had unprotected sex.”
   3. “How can I help you problem solve what will be best for you?”
   4. “You should contact a lawyer who handles adoption.”

9. Juanita, 32 weeks pregnant, comes to the office stating the baby has not been moving as much as usual. All of the following must be assessed. Place them in priority order.
   1. Report findings to the doctor.
   2. Take Juanita’s vital signs.
   3. Measure Juanita’s weight.
   4. Listen to the FHT.
   5. Check Juanita’s urine for glucose and protein.

10. Nancy, 34 weeks pregnant, calls the clinic at 4:30 P.M. to say that she has had a severe headache all day. She is experiencing some blurred vision and her feet are swollen. She asks the nurse what she should do. The nurse should respond,
    1. “Take two Tylenol every 4 hours and stay in bed until your office appointment next week.”
    2. “Go to the hospital to be checked.”
    3. “Come to the office at 10:00 tomorrow morning.”
    4. “Call back in 30 minutes when the doctor can talk with you.”

Answers for Review Questions, as well as discussion of Care Plan and Critical Thinking Care Map questions, appear in Appendix I.