



chapter **14**

Nursing Management During Labor and Birth

Key TERMS

accelerations
artifact
baseline fetal heart rate
baseline variability
crowning
deceleration
electronic fetal monitoring
episiotomy
Leopold's maneuvers
neuraxial
analgesia/anesthesia
periodic baseline changes

Learning OBJECTIVES

After studying the chapter content, the student should be able to accomplish the following:

1. Define the key terms.
2. Describe the assessment data collected on admission to the perinatal unit.
3. Identify the measures used to evaluate maternal status during labor and birth.
4. Compare and contrast the advantages and disadvantages of external and internal fetal monitoring, including the appropriate use for each.
5. Describe appropriate nursing interventions to address nonreassuring fetal heart rate patterns.
6. Outline the nurse's role in fetal assessment.
7. Explain the various comfort-promotion and pain-relief strategies used during labor and birth.
8. Discuss the ongoing assessment involved in each stage of labor and birth.
9. Delineate the nurse's role throughout the labor and birth process.



WOW

Wise nurses are not always silent, but they know when to be during the miracle of birth.

The laboring and birthing process is a life-changing event for many women. Nurses need to be respectful, available, encouraging, supportive, and professional in dealing with all women. The nursing management for labor and birth should include comfort measures, emotional support, information and instruction, advocacy, and support for the partner (Simkin, 2002).

Consider THIS!

Since I was expecting my first child, I was determined to put my best foot forward and do everything right, for I was an experienced OB nurse and in my mind it was expected behavior. I was already 2 weeks past my “calculated due date” and I was becoming increasingly worried. Today I went to work with a backache but felt no contractions. I managed to finish my shift but felt wiped out. As I walked to my car outside the hospital, my water broke and I felt the warm fluid run down my legs. I went back inside to be admitted for this much-awaited event.

Although I had helped thousands of women go through their childbirth experience, I was now the one in the bed and not standing alongside it. My husband and I had practiced our breathing techniques to cope with the discomfort of labor, but this “discomfort” in my mind was more than I could tolerate. So despite my best intentions of doing everything right, within an hour I begged for a “painkiller” to ease the pain. While the medication took the edge off my pain, I still felt every contraction and truly now appreciate the meaning of the word “labor.” Although I wanted to use natural childbirth without any medication, I know that I was a full participant in my son’s birthing experience, and that is what “doing everything right” was for me!

Thoughts: Doing what is right varies for each individual, and as nurses we need to support whatever that is. Having a positive outcome from the childbirth experience is the goal, not the means it takes to achieve it. How can nurses support women in making their personal choices to achieve a healthy outcome? Are any women “failures” if they ask for pain medication to tolerate labor? How can nurses help women overcome this stigma of being a “wimp”?

The health of mothers and their infants is of critical importance, both as a reflection of the current health status of a large segment of our population and as a predictor of the health of the next generation. *Healthy People 2010* (DHHS, 2000) addresses maternal health in two objectives for reducing maternal deaths and for reducing maternal illness and complications due to pregnancy. In addition, another objective addresses increasing the proportion of

pregnant women who attend a series of prepared childbirth classes. (See Chapters 12 and 22 for more information on these objectives.)

This chapter provides information about nursing management during labor and birth. It describes the necessary data to be obtained with the admission assessment and methods to evaluate labor progress and maternal and fetal status. The chapter also describes the major methods for comfort promotion and pain management. The chapter concludes with a discussion of the nursing management specific to each stage of labor, including key nursing measures that focus on maternal and fetal assessments and pain relief.

Admission Assessments

The nurse usually first comes in contact with the woman either by phone or in person. It is important to ascertain whether the woman is in true or false labor and whether she should be admitted or sent home.

If the initial contact is by phone, the nurse needs to establish a therapeutic relationship with the woman. This is facilitated by speaking in a calm, caring tone. When completing a phone assessment, include questions about the following:

- Estimated date of birth, to determine if term or preterm
- Fetal movement (frequency in the past few days)
- Other premonitory signs of labor experienced
- Parity, gravida, and previous childbirth experiences
- Time from start of labor to birth in previous labors
- Characteristics of contractions, including frequency, duration, and intensity
- Appearance of any vaginal bloody show
- Membrane status (ruptured or intact)
- Presence of supportive adult in household or if she is alone

When speaking with the woman over the telephone, review the signs and symptoms that denote true versus false labor, and suggest various positions she can assume to provide comfort and increase placental perfusion. Also suggest walking, massaging, and taking a warm shower to promote relaxation. Outline what foods and fluids are appropriate for oral intake in early labor. Throughout the phone call, listen to the woman’s concerns and answer any questions clearly.

Reducing the risk of liability exposure and avoiding preventable injuries to mothers and fetuses during labor and birth can be accomplished by adhering to two basic tenets of clinical practice: (1) use applicable evidence and/or published standards and guidelines as the foun-

dation of care, and (2) whenever a clinical choice is presented, chose client safety (Simpson & Knox, 2003). With this advice in mind, advise the woman on the phone to contact her healthcare provider for further instructions or to come to the facility to be evaluated, since ruling out true labor and possible maternal-fetal complications cannot be done accurately over the phone.

Additional nursing responsibilities associated with a phone assessment include:

- Consult the woman's prenatal record for parity status, estimated date of birth, and untoward events.
- Call the healthcare provider to inform him or her of the woman's status.
- Prepare for admission to the perinatal unit to ensure adequate staff assignment.
- Notify the admissions office of a pending admission.

If the nurse's first encounter with the woman is in person, an assessment is completed to determine whether she should be admitted to the perinatal unit or sent home until her labor advances. Entering a facility is often an intimidating and stressful event for women since it is an unfamiliar environment. Giving birth for the first time is a pivotal event in the lives of most women. Therefore, demonstrate respect when addressing the client and thoroughly listen and express interest and concern. Nurses must value and respect women and promote their self-worth by allowing them to participate in making decisions and fostering a sense of control (Matthews & Callister, 2004).

An admission assessment includes maternal health history, physical assessment, fetal assessment, laboratory studies, and assessment of psychological status. Usually the facility has a specialized form that can be used throughout labor and birth to document assessment findings (Fig. 14-1).

Maternal Health History

A maternal health history should include typical biographical data such as the woman's name and age and the name of delivering healthcare provider. Other information that is collected includes the prenatal record data, including the estimated date of birth, a history of the current pregnancy, and the results of any laboratory and diagnostic tests, such as blood type and Rh status; past pregnancy and obstetric history; past health history and family history; prenatal education; list of medications; risk factors such as diabetes, hypertension, use of tobacco, alcohol, or illicit drugs; reason for admission, such as labor, cesarean birth, or observation for a complication; history of potential domestic violence; history of previous preterm births; allergies; time of last food ingestion; method chosen for infant feeding; name of birth attendant and pediatrician; and pain management plan.

Ascertaining this information is important to develop an individualized plan of care for the woman. If, for

example, the woman's due date is still 2 months away, it is important to establish this information so interventions can be initiated to arrest the labor immediately or notify the intensive perinatal team to be available. In addition, if the woman is a diabetic, it is critical to monitor her glucose levels during labor, to prepare for a surgical birth if dystocia of labor occurs, and to alert the newborn nursery of potential hypoglycemia in the newborn after birth. By collecting important information about each woman they care for, nurses can help improve the outcomes for all concerned.

Be sure to observe the woman's emotions, support system, verbal interaction, body language and posture, perceptual acuity, and energy level. Also note her cultural background and language spoken. This psychosocial information provides cues about the woman's emotional state, culture, and communication systems. For example, if the woman arrives at the labor and birth suite extremely anxious, alone, and unable to communicate in English, how can the nurse meet her needs and plan her care appropriately? It is only by assessing each woman physically and psychosocially that the nurse can make astute decisions regarding proper care. In this case, an interpreter would be needed to assist in the communication process between the healthcare staff and the woman to initiate proper care.

It is important for the nurse to acknowledge and try to understand the cultural differences in women with cultural backgrounds different from that of the nurse. Attitudes toward childbirth are heavily influenced by the culture in which the woman has been raised. As a result, within every society, specific attitudes and values shape the woman's childbearing behaviors. Be aware of what these are. When carrying out a cultural assessment during the admission process, ask questions (Box 14-1) to help plan culturally competent care during labor and birth.

Physical Examination

The physical examination typically includes a generalized assessment of the woman's body systems, including hydration status, vital signs, auscultation of heart and lung sounds, and measurement of height and weight. The physical examination also includes the following assessments:

- Fundal height measurement
- Uterine activity, including contraction frequency, duration, and intensity
- Status of membranes (intact or ruptured)
- Cervical dilatation and degree of effacement
- Fetal status, including heart rate, position, and station
- Pain level

These assessment parameters (described in greater detail later in this chapter), form a baseline against which the nurse can compare all future values throughout labor. The findings should be similar to those of the woman's prepregnancy and pregnancy findings, with the exception

ADMISSION ASSESSMENT OBSTETRICS

▲ PATIENT IDENTIFICATION ▲

ADMISSION DATA

Date _____		Time _____		Via <input type="checkbox"/> Ambulatory <input type="checkbox"/> Wheelchair <input type="checkbox"/> Stretcher			
Grav. _____	Term _____	Pre-term _____	Ab. _____	Living _____	EDC _____	LMP _____	GA _____
Prev. adm. date _____				Reason _____			
Obstetrician _____				Pediatrician _____			
Ht. _____		Wt. _____		Wt. gain _____			
Allergies (meds/food) <input type="checkbox"/> None _____ <input type="checkbox"/> Hx latex sensitivity _____							
BP _____		T _____		P _____		R _____	
FHR _____				Vag exam _____			

Reason for Admission

Labor / SROM Induction _____

Primary C/S _____ Repeat C/S _____

Observation _____

OB / Medical complication _____

Onset of labor: Not in labor

Date _____ Time _____

Membranes: Intact

Ruptured / Date _____ Time _____

Clear Meconium Bloody Foul

Vaginal bleeding: None

Normal show _____

Current Pregnancy Labs NPC

POL PPROM Cerclage

PIH Chr. HTN Other _____

Diabetes _____ Diet _____

Insulin _____

Amniocentesis _____ Results _____

Bld type / RH _____ Date Rhogam _____

Antibody screen <input type="checkbox"/> Neg <input type="checkbox"/> Pos	Hepatitis B <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> No
Rubella <input type="checkbox"/> Non-immune <input type="checkbox"/> Immune	HIV <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> No
Diabetic screen <input type="checkbox"/> Normal <input type="checkbox"/> Abnormal	Group B strep <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> No
Recent exposure to chick pox <input type="checkbox"/>	GC <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> No
Current meds: _____	Chlamydia <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> No
	RPR <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> No

Previous OB History

POL Multiple gestation

Prev C/S type _____ Reason _____

PIH Chronic HTN Diabetes _____

Stillbirth/demise Neodeath Anomalies

Precipitous labor (<3 H) Macrosomia

PP Hemorrhage

Hx Transfusion reaction Yes No

Other _____

Latest risk assessment None

1. _____ 3. _____

2. _____ 4. _____

Date _____

Signature _____ Time _____

NEUROLOGICAL

WNL

Variance: HA

Scotoma / visual changes

Reflexes < 2+ > 2+
 Clonus _____ bts

Numbness Tingling

Hx Seizures

PESPIRATORY

WNL

Variance: Hx Asthma URI

Respirations: < 12 > 24

Effort: SOB

Shallow Labored

Auscultation:
 Diminished Crackles
 Wheezes Rhonchi No Yes
 Cough for greater than 2 weeks?
 Is the cough productive?
 Blood in the sputum?
 Experiencing any fever or night sweats?
 Ever had TB in the past?
 Recent exposure to TB?
 Weight loss in last 3 weeks?
If the patient answers yes to any three of the above questions implement policy and procedure # 5725-0704.

GASTROINTESTINAL

WNL

Variance: Heartburn

Epigastric pain Nausea

Vomiting Diarrhea

Constipation Pain

Wt. Gain < 2lbs / month**

Recent change in appetite of < 50% of usual intake for > 5 days

INTEGUMENTARY

WNL

Variance: Rash Lacerations

Abrasion Swelling

Urticaria Bruising

Diaphoretic/hot

Clammy/cold

Scars

FETAL ASSESSMENT

WNL

Variance: NRFS

FHR < 110 > 160

LTV Absent Minimal
 Increased

STV Absent

Decelerations: _____
 Decreased fetal movement
 IUGR

Tobacco use Denies Yes Amt _____

Alcohol use Denies Yes Amt _____

Drug use Denies Yes Amt type _____

Primary language English Spanish _____

PAIN ASSESSMENT

1. Do you have any ongoing pain problems? No Yes

2. Do you have any pain now? No Yes

3. If any of the above questions are answered yes, the patient has a positive pain screening.

4. Patient to be given pain management education material.
 Complete pain / symptom assessment on flowsheet.

5. Please proceed to complete pain assessment.

CARDIOVASCULAR

WNL

Variance: _____

MVP

Heart rate: < 60 > 100

B/P: Systolic: < 90 > 140
 Diastolic: < 50 > 90

Edema _____

Chest pain / palpitations _____

MUSCULOSKELETAL

WNL

Variance: _____

Numbness Tingling

Paralysis Deformity

Scoliosis

GENITOURINARY

WNL

Variance: Albumin _____

Output: < 30 cc/Hr.

UTI Rx Frequency

Dysuria Hematuria

CVA Tenderness

Hx STD _____

Vag. discharge _____

Rash Blisters

Warts Lesions

EARS, NOSE, THROAT, AND EYES

WNL

Variance: _____

Sore throat Eyeglasses

Runny nose Contact lenses

Nasal congestion

PSYCHOSOCIAL

WNL

Variance: Hx depression
 Yes No

Emotional behavioral care

Affect: Flat Anxious

Uncooperative Combative

Living will Yes No
 On chart

Healthcare surrogate Yes No
 On chart

Are you being hurt, hit, frightened by anyone at home or in your life? Yes No

Religious preference _____

● Figure 14-1 Sample documentation form used for admission to the perinatal unit. (Used with permission. Briggs Corporation, 2001.)

BOX 14-1

QUESTIONS FOR PROVIDING CULTURALLY COMPETENT CARE DURING LABOR AND BIRTH

- Where were you born? How long have you lived in the United States?
- What languages do you speak and read?
- Who are your major support people?
- What are your religious practices?
- How do you view childbearing?
- Are there any special precautions or restrictions that are important?
- Is birth considered a private or a social experience?
- How would you like to manage your labor discomfort?
- Who will provide your labor support? (Moore & Moos, 2003)

of her pulse rate, which might be elevated secondary to her anxious state with beginning labor.

Laboratory Studies

On admission, laboratory studies typically are done to establish a baseline. Although the exact tests may vary among facilities, they usually include a urinalysis via clean-catch urine specimen and complete blood count (CBC). Blood typing and Rh factor analysis may be necessary if the results of these are unknown or unavailable. Other tests that may be done include syphilis screening, hepatitis B (HbsAg) screening, HIV testing (if woman gives consent), and possible drug screening if history is positive.

Evaluation of Labor Progress

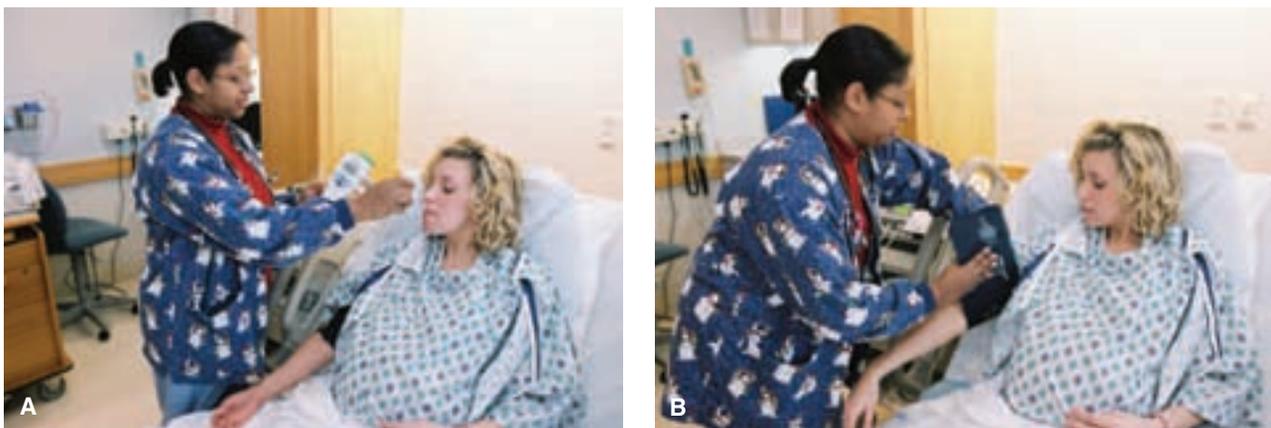
Childbirth, a physiologic process that is fundamental to all human existence, is one of the most significant cultural, psychological, spiritual, and behavioral events in a woman's life. Although the act of giving birth is a uni-

versal phenomenon, it is a unique experience for each woman. Continuous evaluation and appropriate intervention for women during labor are key to promoting a positive outcome for the family.

The nurse's role in childbirth is to ensure a safe environment for the mother and the birth of her newborn. Nurses begin evaluating the mother and fetus during the admission procedures at the healthcare agency and continue throughout labor. It is critical to provide anticipatory guidance and explain each procedure (fetal monitoring, intravenous therapy, medications given, and expected reactions) and what will happen next. This will prepare the woman for the upcoming physical and emotional challenges, thereby helping to reduce her anxiety. Acknowledging her support systems (family or partner) helps allay their fears and concerns, thereby assisting them in carrying out their supportive role. Knowing how and when to evaluate a woman during the various stages of labor is essential for all labor and birth nurses to ensure a positive maternal experience and a healthy newborn.

Maternal Assessment

During labor and birth, various techniques are used to assess maternal status. These techniques provide an ongoing source of data to determine the woman's response to and her progress in labor. Assess maternal vital signs, including temperature, blood pressure, pulse, respiration, and pain, which are primary components of the physical examination and ongoing assessment (Fig. 14-2). Also review the prenatal record to identify risk factors that may contribute to a decrease in uteroplacental circulation during labor. Monitor vital signs (blood pressure, pulse, and respirations) every 4 hours in the latent phase of labor, hourly in the active phase, and every 15 to 30 minutes during the transition phase of labor. Monitor temperature every 4 hours until the membranes have ruptured, and then every 1 to 2 hours thereafter. Assess uterine activity and fetal heart rate (FHR) every 30 to 60 minutes in the first stage of labor and every 15 to 30 minutes in the active



● Figure 14-2 Assessment of vital signs. (A) Nurse monitoring temperature. (B) Nurse assessing blood pressure.

and transition phases. If there is no vaginal bleeding on admission, a vaginal examination is performed to assess cervical dilation, after which it is monitored periodically as necessary to identify progress. Evaluate maternal pain and the effectiveness of pain-management strategies at regular intervals during labor and birth.

Vaginal Examination

Although not all nurses perform vaginal examinations on laboring women in all practice settings, most nurses working in community hospitals do so because physicians are not routinely present in labor and birth suites. Since most newborns in the United States are born in community hospitals, nurses are performing vaginal examinations (AHA, 2003). Vaginal examinations are also performed by midwives and physicians. It is an assessment skill that takes time and experience to develop; only by doing it frequently in clinical practice can the practitioner's skill level improve.

The purpose of performing a vaginal examination is to assess the amount of cervical dilation, percentage of cervical effacement, and fetal membrane status and gather information on presentation, position, station, degree of fetal head flexion, and presence of fetal skull swelling or molding (Fig. 14-3). Prepare the woman by informing her about the procedure, what information will be obtained from it, how she can assist with the procedure, how it will be performed, and who will be performing it.

The woman is typically on her back during the vaginal examination. The vaginal examination is performed gently, with concern for the woman's comfort. If it is the initial vaginal examination to check for membrane status, water is used as a lubricant. If membranes have already ruptured, an antiseptic solution is used to prevent an

ascending infection. After donning sterile gloves, the examiner inserts his or her index and middle fingers into the vaginal introitus. Next, the cervix is palpated to assess dilation, effacement, and position (e.g., posterior or anterior). If the cervix is open to any degree, the presenting fetal part, fetal position, station, and presence of molding can be assessed. In addition, the membranes can be evaluated and described as intact, bulging, or ruptured.

At the conclusion of the vaginal examination, the findings are discussed with the woman and her partner to bring them up to date about labor progress. In addition, the findings are documented either electronically or in writing and reported to the primary healthcare professional in charge of the case.

Cervical Dilation and Effacement

The amount of cervical dilation and the degree of cervical effacement are key areas assessed during the vaginal examination as the cervix is palpated with the gloved index finger. Although this finding is somewhat subjective, experienced examiners typically come up with similar findings. The width of the cervical opening determines dilation, and the length of the cervix assesses effacement. The information yielded by this examination serves as a basis for determining which stage of labor the woman is in and what her ongoing care should be.

Fetal Descent and Presenting Part

In addition to cervical dilation and effacement findings, the vaginal examination can also determine fetal descent (station) and presenting part. During the vaginal examination, the gloved index finger is used to palpate the fetal skull (if vertex presentation) through the opened cervix or the buttocks in the case of a breech presentation. Station is assessed in relation to the maternal ischial spines and the presenting fetal part. These spines are not sharp protrusions but rather blunted prominences at the mid-pelvis. The ischial spines serve as landmarks and have been designated as zero station. If the presenting part is palpated higher than the maternal ischial spines, a negative number is assigned; if the presenting fetal part is felt below the maternal ischial spines, a plus number is assigned, denoting how many centimeters below zero station.

Progressive fetal descent (−5 to +4) is the expected norm during labor—moving downward from the negative stations to zero station to the positive stations in a timely manner. If progressive fetal descent does not occur, a disproportion between the maternal pelvis and the fetus might exist and needs to be investigated.

Rupture of Membranes

The integrity of the membranes can be determined during the vaginal examination. Typically, if intact, the membranes will be felt as a soft bulge that is more prominent during a contraction. If the membranes have ruptured, the woman may have reported a sudden gush of fluid. Membrane rupture also may occur as a slow trickle of fluid.



● Figure 14-3 Vaginal examination to determine cervical dilation and effacement.

To confirm that membranes have ruptured, a sample of fluid is taken from the vagina and tested with Nitrazine paper to determine the fluid's pH. Vaginal fluid is acidic, whereas amniotic fluid is alkaline and turns Nitrazine paper blue. Sometimes, however, false-positive results may occur, especially in women experiencing a large amount of bloody show, because blood is alkaline. The membranes are most likely intact if the Nitrazine test tape remains yellow to olive green, with pH between 5 and 6. The membranes are probably ruptured if the Nitrazine test tape turns a blue-green to deep blue, with pH ranging from 6.5 to 7.5 (Olds et al., 2004).

If the Nitrazine test is inconclusive, an additional test, called the fern test, can be used to confirm rupture of membranes. With this test, a sample of fluid is obtained, applied to a microscope slide, and allowed to dry. Using a microscope, the slide is examined for a characteristic fern pattern that indicates the presence of amniotic fluid.

Uterine Contractions

The primary power of labor is uterine contractions, which are involuntary. Uterine contractions increase intrauterine pressure, causing tension on the cervix. This tension leads to cervical dilation and thinning, which in turn eventually forces the fetus through the birth canal. Normal uterine contractions have a contraction (systole) and a relaxation (diastole) phase. The contraction resembles a wave, moving downward to the cervix and upward to the fundus of the uterus. Each contraction starts with a building up (increment), gradually reaching an acme (peak intensity), and then a letting down (decrement). Each contraction is followed by an interval of rest, which ends when the next contraction begins. At the acme (peak) of the contraction, the entire uterus is contracting, with the greatest intensity in the fundal area. The relaxation phase follows and occurs simultaneously throughout the uterus.

Uterine contractions during labor are monitored by palpation and by electronic monitoring. Assessment of the contractions includes frequency, duration, intensity, and uterine resting tone (see Chapter 13 for a more detailed discussion).

Uterine contractions with an intensity of 30 mm Hg or greater initiate cervical dilation. During active labor, the intensity usually reaches 50 to 80 mm Hg. Resting tone is normally between 5 and 10 mm Hg in early labor and between 12 and 18 mm Hg in active labor (Gilbert & Harmon, 2003).

To palpate the fundus for contraction intensity, place the pads of your fingers on the fundus and describe how it feels: like the tip of the nose (mild), like the chin (moderate), or like the forehead (strong). Palpation of intensity is a subjective judgment of the indentability of the uterine wall; a descriptive term is assigned (mild, moderate, or strong (Fig. 14-4)). Frequent clinical experience is needed to gain accuracy in assessing the intensity of uterine contractions.



● Figure 14-4 Nurse palpating the woman's fundus during a contraction.

The second method used to assess the intensity of uterine contractions is electronic monitoring, either external or internal. Both methods provide an accurate measurement of the actual intensity of uterine contractions. Although the external fetal monitor is sometimes used to estimate the intensity of uterine contractions, it is not as accurate an assessment tool.

For woman at risk for preterm birth, home uterine activity monitoring can be used to screen for prelabor uterine contractility so that escalating contractility can be identified, allowing earlier intervention to prevent preterm birth. The home uterine activity monitor consists of a pressure sensor attached to a belt that is held against the abdomen and a recording/storage device that is carried on a belt or hung from the shoulder. Uterine activity is typically recorded by the woman for one hour twice daily, while performing routine activities. The stored data are transmitted via telephone to a perinatal nurse, where a receiving device prints out the data. The woman is contacted if there are any problems.

Although in theory identifying early contractions to initiate interventions to arrest the labor sounds reasonable, research shows that uterine activity monitoring in asymptomatic high-risk women is inadequate for predicting preterm birth (Newman, 2003). This practice continues even though numerous randomized trials have found no relationship between monitoring and actual reduction of preterm labor. The value of monitoring uterine contraction frequency as a predictor of preterm delivery remains unclear (Iams et al., 2002).

Leopold's Maneuvers

Leopold's maneuvers are a method for determining the presentation, position, and lie of the fetus through the use of four specific steps. This method involves inspection and palpation of the maternal abdomen as a screening assessment for malpresentation. A longitudinal lie is

expected, and the presentation can be cephalic, breech, or shoulder. Each maneuver answers a question:

- What fetal part (head or buttocks) is located in the fundus (top of the uterus)?
- On which maternal side is the fetal back located? (Fetal heart tones are best auscultated through the back of the fetus.)

- What is the presenting part?
- Is the fetal head flexed and engaged in the pelvis? (Nursing Procedure 14-1)

Fetal Assessment

A fetal assessment identifies well-being and signs indicative of compromise. It primarily focuses on determining the

Nursing Procedure 14-1

Performing Leopold's Maneuvers

Purpose: To Determine Fetal Presentation, Position, and Lie

1. Place the woman in the supine position and stand beside her.
2. Perform the first maneuver to determine presentation.
 - a. Facing the woman's head, place both hands on the abdomen to determine fetal position in the uterine fundus.
 - b. Feel for the buttocks, which will feel soft and irregular (indicates vertex presentation); feel for the head, which will feel hard, smooth, and round (indicates a breech presentation).



First maneuver



Second maneuver

3. Complete the second maneuver to determine position.
 - a. While still facing the woman, move hands down the lateral sides of the abdomen to palpate on which side the back is (feels hard and smooth).
 - b. Continue to palpate to determine on which side the limbs are located (irregular nodules with kicking and movement).
4. Perform the third maneuver to confirm presentation.
 - a. Move hands down the sides of the abdomen to grasp the lower uterine segment and palpate the area just above the symphysis pubis.
 - b. Place thumb and fingers of one hand apart and grasp the presenting part by bringing fingers together.
 - c. Feel for the presenting part. If the presenting part is the head, it will be round, firm, and ballotable; if it is the buttocks, it will feel soft and irregular.

Nursing Procedure 14-1

Performing Leopold's Maneuvers (continued)

Purpose: To Determine Fetal Presentation, Position, and Lie



Third maneuver

5. Perform the fourth maneuver to determine attitude.
 - a. Turn to face the client's feet and use the tips of the first three fingers of each hand to palpate the abdomen.

- b. Move fingers toward each other while applying downward pressure in the direction of the symphysis pubis. If you palpate a hard area on the side opposite the fetal back, the fetus is in flexion, because you have palpated the chin. If the hard area is on the same side as the back, the fetus is in extension, because the area palpated is the occiput.
- c. Also, note how your hands move. If the hands move together easily, the fetal head is not descended into the woman's pelvic inlet. If the hands do not move together and stop because of resistance, the fetal head is engaged into the woman's pelvic inlet (Dillon, 2003).



Fourth maneuver

FHR pattern, but the character of the amniotic fluid is also assessed. Amniotic fluid should be clear when membranes rupture, either spontaneously or artificially through an amniotomy (a disposable plastic hook [Amnihook] is used to perforate the amniotic sac). Cloudy or foul-smelling amniotic fluid indicates infection, whereas green fluid indicates that the fetus has passed meconium secondary to transient hypoxia (McKinney et al., 2005).

Analysis of the FHR is one of the primary evaluation tools used to determine fetal oxygen status indirectly. FHR assessment can be done intermittently using a fetoscope (a modified stethoscope attached to a headpiece) or a Doppler (ultrasound) device or continuously with an electronic fetal monitor applied externally or internally.

Intermittent FHR Monitoring

Intermittent FHR monitoring involves auscultation via a fetoscope or a hand-held Doppler device that uses ultrasound waves that bounce off the fetal heart, producing echoes or clicks that reflect the rate of the fetal heart (Fig. 14-5). Traditionally, a fetoscope was used to assess fetal heart rate, but the Doppler device has been found to have a greater sensitivity than the fetoscope (Engstrom, 2004); thus, at present it is more commonly used.

Doppler devices are relatively low in cost and are not used only in hospitals. Pregnant women can purchase them to aid in reducing anxiety between clinical examinations if they had a previous problem during pregnancy (Mainstone, 2004).



● Figure 14-5 Auscultating fetal heart rate.

Intermittent FHR monitoring affords the advantage of mobility for the woman in the first stage of labor. She is free to move around and change position at will since she is not attached to a stationary electronic fetal monitor. However, intermittent monitoring does not document how the fetus responds to the stress of labor and does not provide a continuous recording of the fetal heart rate. In addition, it does not show the fetal response during the acme of a contraction, because intermittent monitoring is typically done after a contraction, when the uterus is relaxed. The pressure of the device during a contraction is uncomfortable and can distract the woman from using her paced-breathing patterns.

Intermittent FHR auscultation can be used to detect FHR baseline and rhythm and changes from baseline. However, it cannot detect variability and types of decelerations, as electronic fetal monitoring can (Feinstein et al., 2003). During intermittent auscultation to establish a baseline, the FHR is assessed for a full minute after a contraction. From then on, unless there is a problem, listening for 30 seconds and multiplying the value by two is sufficient. If the woman experiences a change in condition during labor, auscultation assessments should be more frequent. Changes in condition include ruptured membranes or the onset of bleeding. In addition, more frequent assessments occur after periods of ambulation, after a vaginal examination, after administration of pain medications, or other clinical important events (SOGC, 2002).

The FHR is heard most clearly at the fetal back. In a cephalic presentation, the FHR is best heard in the lower quadrant of the maternal abdomen. In a breech presentation, it is heard at or above the level of the maternal umbilicus (Fig. 14-6). As labor progresses, the FHR location will change accordingly as the fetus descends lower into the maternal pelvis for the birthing process. To ensure that the maternal heart rate is not confused with the fetal heart rate, palpate the client's radial pulse simultaneously while the FHR is being auscultated through the abdomen.

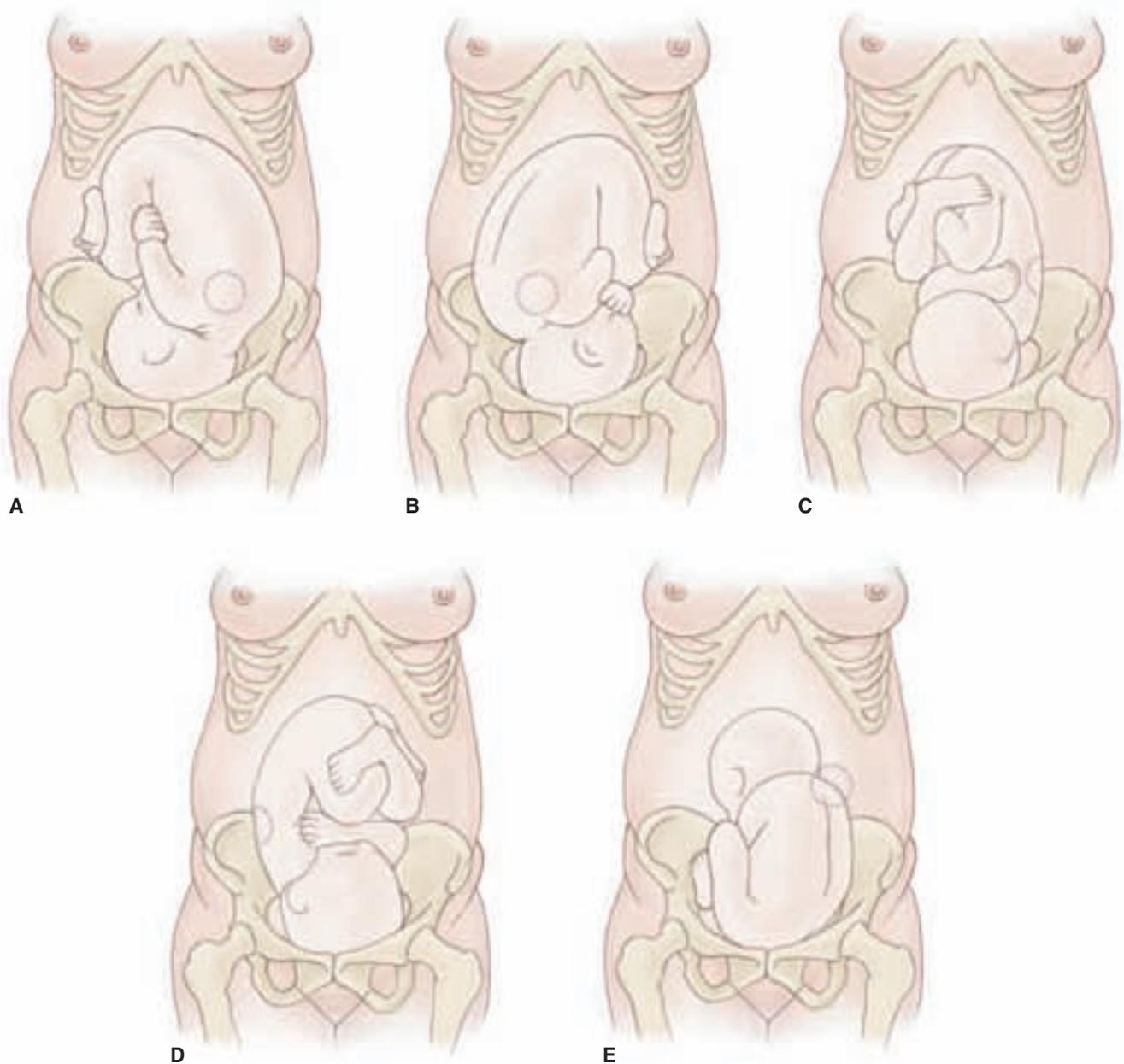
The procedure for using a fetoscope or Doppler device to assess FHR is similar (see Nursing Procedure 12-1 in Chapter 12). The main difference is that a small amount of water-soluble gel is applied to the woman's abdomen or ultrasound device before auscultation to promote sound wave transmission. This gel is not needed when a fetoscope is used. Usually the FHR is best heard in the woman's lower abdominal quadrants, but if it is not found quickly, it may help to locate the fetal back by performing Leopold's maneuvers.

Although the intermittent method of FHR assessment allows the client to move about during her labor, the information obtained fails to provide a complete picture of the well-being of the fetus moment to moment. This leads to the question of what the fetal status is during the times that are not assessed. For women who are considered at low risk for complications, this period of non-assessment is not a problem. However, for the undiagnosed high-risk woman, it might prove ominous.

National professional organizations have provided general guidelines for the frequency of assessments based on existing evidence. The American College of Obstetricians and Gynecologists (ACOG), the Institute for Clinical Systems Improvement (ICSI), and the Association of Women's Health, Obstetric, and Neonatal Nurses (AWHONN) have published guidelines designed to assist clinicians in caring for laboring clients. Their recommendations are supported by large controlled studies. They recommend the following guidelines for assessing FHR:

- Initial 10- to 20-minute continuous FHR assessment on entry into labor/birth area
- Completion of a prenatal and labor risk assessment on all clients
- Intermittent auscultation every 30 minutes during active labor for a low-risk woman and every 15 minutes for a high-risk woman
- During the second stage of labor, every 15 minutes for the low-risk woman and every 5 minutes for the high-risk woman and during the pushing stage (ACOG, 2005; AWHONN, 2000; ICSI, 2003).

In several randomized controlled studies comparing intermittent auscultation with electronic monitoring in both low- and high-risk clients, no difference in intra-partum fetal death was found. However, in each study a nurse-client ratio of 1:1 was consistently maintained during labor (ICSI, 2003). This suggests that adequate staffing is essential with intermittent FHR monitoring to ensure optimal outcomes for the mother and fetus. Although there is insufficient evidence to indicate specific situations where continuous electronic fetal monitoring might result in better outcomes when compared to intermittent assessment, for pregnancies involving an increased risk of peri-



● **Figure 14-6** Locations for auscultating fetal heart rate based on fetal position. (A) Left occiput anterior (LOA). (B) Right occiput anterior (ROA). (C) Left occiput posterior (LOP). (D) Right occiput posterior (ROP). (E) Left sacral anterior (LSA).

natal death, cerebral palsy, or neonatal encephalopathy and use of oxytocin for induction or augmentation, it is recommended that continuous electronic fetal monitoring be used rather than intermittent fetal auscultation (SOGC, 2002, p. 6).

Continuous Electronic Fetal Monitoring

Electronic fetal monitoring uses a machine to produce a continuous tracing of the FHR. When the monitoring device is in place, an audible sound is produced

with each heartbeat. In addition, a graphic record of the FHR pattern is produced.

Current methods of continuous electronic fetal monitoring were introduced in the United States during the 1960s, specifically for use in clients considered to be high risk. However, the use of these methods gradually increased and they eventually came to be used for women considered to be high or low risk. This increased use has become controversial, because it was suspected of being associated with unnecessary cesarean birth, rates of which

have climbed steadily (Sisk, 2002). The efficacy of electronic fetal monitoring depends on the accurate interpretation of the tracings, not necessarily which method (external vs. internal) is used.

Having a continuous assessment of fetal well-being documented during the stress of labor is important. The concept of hearing and evaluating every beat of the fetus's heart to allow for early intervention seems logical. However, the use of continuous electronic fetal monitoring has had no demonstrated effect on the incidence of newborns born with neurologic damage. Furthermore, the rate of preterm birth and cesarean births has increased markedly (Priddy, 2004).

The use of continuous fetal monitoring for all pregnant clients, whether high risk or low risk, has been criticized by various groups within the medical community. Concerns about the efficiency and safety of routine electronic fetal monitoring in labor have led expert panels in the United States to recommend that such monitoring be limited to high-risk pregnancies. However, its use in low-risk pregnancies continues globally (Thacker & Stroup, 2003). This remains an important research issue.

With electronic fetal monitoring, there is a continuous record of the fetal heart rate, and thus no gaps exist, as they do with intermittent auscultation. On the downside, using continuous monitoring can limit maternal movement and encourages her to lie in the supine position, which reduces placental perfusion. Despite the criticism, electronic fetal monitoring remains an accurate method for determining fetal health status by providing a moment-to-moment printout of FHR status.

Continuous electronic fetal monitoring can be performed externally (indirectly) with attachment to the maternal abdominal wall or internally (directly) with attachment to the fetus. Both methods provide a continuous printout of the FHR, but they differ in their specificity.

External Monitoring

In external or indirect monitoring, two ultrasound transducers, each of which is attached to a belt, are applied around the woman's abdomen. They are similar to the hand-held Doppler device. One transducer, called a tocotransducer, detects changes in uterine pressure and converts the pressure registered into an electronic signal that is recorded on graph paper (Pillitteri, 2003). The tocotransducer is placed over the uterine fundus in the area of greatest contractility to monitor uterine contractions. The other ultrasound transducer records the baseline FHR, long-term variability, accelerations, and decelerations. It is positioned on the maternal abdomen in the midline between the umbilicus and the symphysis pubis. The diaphragm of the ultrasound transducer is moved to either side of the abdomen to obtain a stronger sound and then attached to the second elastic belt. This transducer converts the fetal heart movements into audible beeping sounds and records them on graph paper (Fig. 14-7).



● Figure 14-7 Continuous external EFM device applied to the woman in labor.

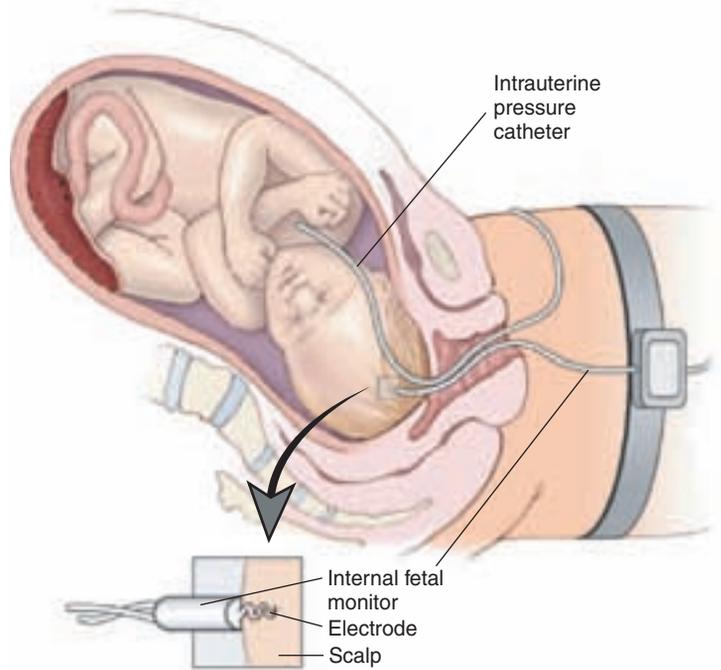
Good continuous data are provided on the FHR. External monitoring can be used while the membranes are still intact and the cervix is not yet dilated. It is non-invasive and can detect relative changes in abdominal pressure between uterine resting tone and contractions. External monitoring also measures the approximate duration and frequency of contractions, providing a permanent record of FHR (Feinstein et al., 2003).

However, external monitoring can restrict the mother's movements. It also cannot detect short-term variability. Signal disruptions can occur due to maternal obesity, fetal malpresentation, and fetal movement, as well as by artifact. **Artifact** describes irregular variations or absence of FHR on the fetal monitor record, resulting from mechanical limitations of the monitor or electrical interference. For instance, the monitor may pick up transmissions from CB radios used by truck drivers on nearby roads and translate them into a signal. Additionally, gaps in the monitor strip can occur periodically without explanation.

Continuous Internal Monitoring

Continuous internal monitoring is usually indicated for women or fetuses considered high risk. Possible conditions might include multiple gestation, decreased fetal movement, abnormal FHR on auscultation, intrauterine growth restriction (IUGR), maternal fever, preeclampsia, dysfunctional labor, preterm birth, or medical conditions such as diabetes or hypertension. It involves the placement of a spiral electrode into the fetal presenting part, usually the head, to assess FHR and a pressure transducer internally to record uterine contractions (Fig. 14-8). The fetal spiral electrode is considered the most accurate method of detecting fetal heart characteristics and patterns because it involves directly receiving a signal from the fetus (Feinstein et al., 2003).

Both the FHR and the duration and interval of uterine contractions are recorded on the graph paper. This method permits evaluation of baseline heart rate and changes in rate and pattern.



● Figure 14-8 Continuous internal EFM.

Four specific criteria must be met for this type of monitoring to be used:

- Ruptured membranes
- Cervical dilation of at least 2 cm
- Presenting fetal part low enough to allow placement of the scalp electrode
- Skilled practitioner available to insert spiral electrode (Ladewig, London, & Davidson, 2006)

Compared to external monitoring, continuous internal monitoring can accurately detect both short-term (moment-to-moment changes) and long-term variability (fluctuations within the baseline) and FHR dysrhythmias. In addition, it allows for maternal positional changes and movement that doesn't interfere with the quality of the tracing.

FHR Patterns

Assessment parameters of the FHR are classified as baseline rate, baseline variability (long-term and short-term), and periodic changes in the rate (accelerations and decelerations). The nurse must be able to interpret the various FHR parameters to determine if the pattern is reassuring (indicating fetal well-being) or nonreassuring (indicating fetal problems) to care for the woman effectively during labor and birth. Table 14-1 summarizes these patterns.

Baseline FHR

Baseline fetal heart rate refers to the average FHR that occurs during a 10-minute segment that excludes periodic or episodic rate changes, such as tachycardia or

Table 14-1 Interpreting FHR Patterns

FHR Pattern	
Reassuring FHR signs	<ul style="list-style-type: none"> • Normal baseline (110–160 bpm) • Moderate bradycardia (100–120 bpm); good variability • Good beat-to-beat variability and fetal accelerations
Nonreassuring signs	<ul style="list-style-type: none"> • Fetal tachycardia (>160 bpm) • Moderate bradycardia (100–110 bpm); lost variability • Absent beat-to-beat variability • Marked bradycardia (90–100 bpm) • Moderate variable decelerations
Ominous signs	<ul style="list-style-type: none"> • Fetal tachycardia with loss of variability • Prolonged marked bradycardia (<90 bpm) • Severe variable decelerations (<70 bpm) • Persistent late decelerations

Sources: Moses, 2003; Littleton & Engebretson, 2005; Feinstein et al., 2003; Engstrom, 2004; Tucker, 2004.

bradycardia. It is assessed when the woman has no contractions and the fetus is not experiencing episodic FHR changes. The normal baseline FHR ranges between 110 and 160 beats per minute (bpm). The normal baseline FHR can be obtained by auscultation, ultrasound, or Doppler, or by a continuous internal direct fetal electrode.

Fetal bradycardia occurs when the FHR is below 110 bpm and lasts 10 minutes or longer. It can be the initial response of a healthy fetus to asphyxia. Causes of fetal bradycardia might include fetal hypoxia, prolonged maternal hypoglycemia, fetal acidosis, administration of drugs to the mother, hypothermia, maternal hypotension, prolonged umbilical cord compression, and fetal congenital heart block (Engstrom, 2004). Bradycardia may be benign if it is an isolated event, but it is considered an ominous sign when accompanied by a decrease in long-term variability and late decelerations.

Fetal tachycardia is a baseline FHR greater than 160 bpm that lasts for 10 minutes or longer. It can represent an early compensatory response to asphyxia. Other causes of fetal tachycardia include fetal hypoxia, maternal fever, maternal dehydration, amnionitis, drugs (e.g., cocaine, amphetamines, nicotine), maternal hyperthyroidism, maternal anxiety, fetal anemia, prematurity, fetal heart failure, and fetal arrhythmias (Ladewig, London, & Davidson, 2006). Fetal tachycardia is considered an ominous sign if it is accompanied by a decrease in variability and late decelerations (Ladewig, London, & Davidson, 2006).

Baseline Variability

Baseline variability is defined as the fluctuations of the FHR observed along the baseline in the absence of contractions, decelerations, and accelerations (Cypher et al., 2003). It represents the interplay between the parasympathetic and sympathetic nervous systems. The constant interplay (push-and-pull effect) on the FHR from the parasympathetic and sympathetic systems produces a moment-to-moment change in the FHR. Because vari-

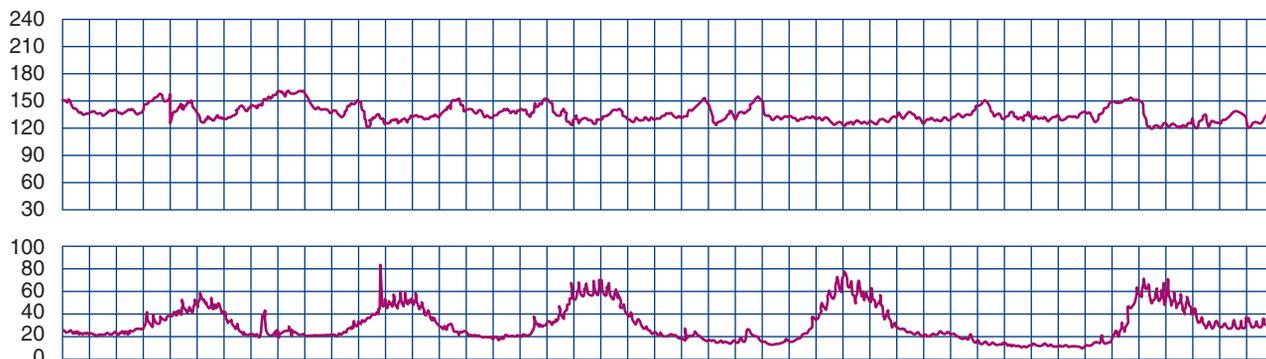
ability is in essence the combined result of autonomic nervous system branch function, its presence implies that the both branches are working and receiving adequate oxygen (Feinstein et al., 2003). Thus, variability is one of the most important characteristics of the FHR. Two components of baseline variability are described: short-term and long-term.

Short-term variability is the beat-to-beat change in FHR. It represents the variations or fluctuations of the baseline that, when seen on the fetal monitor tracing, produces the irregularity within the baseline. It can be measured by internal monitoring and is classified as either present or absent. The presence of short-term variability typically indicates a well-oxygenated, nonacidemic fetus (Murray, 2004). The most practical way to determine the presence or absence of short-term variability is visually. The fetal heart tracing line is evaluated for roughness or smoothness. If roughness is present in the baseline, short-term variability is present; if smoothness is present, it is absent.

Long-term variability is the waviness or rhythmic fluctuations, which are described as cycles per minute. The frequency of cycles is 3 to 6 per minute. It is classified as absent (<3 bpm), decreased or minimal (3 to 5 bpm), average or moderate (6 to 25 bpm), and marked or salutatory (>25 bpm) (Cypher et al., 2003) (Fig. 14-9).

FHR variability is an important clinical indicator that is predictive of fetal acid-base balance and cerebral tissue perfusion (Baird & Ruth, 2002). As the central nervous system is desensitized by hypoxia and acidosis, FHR decreases until a smooth baseline pattern appears. Loss of variability may be associated with a poor outcome. Some causes of decreased variability include fetal hypoxia/acidosis, drugs that depress the central nervous system, congenital abnormalities, fetal sleep, prematurity, and fetal tachycardia (Pillitteri, 2003).

External electronic fetal monitoring is not able to assess short-term variability. Therefore, if external monitoring shows a baseline that is smoothing out, use of an internal spiral electrode should be considered to gain a more accurate picture of the fetal health status.



● Figure 14-9 Long-term variability (average or moderate).

Periodic Baseline Changes

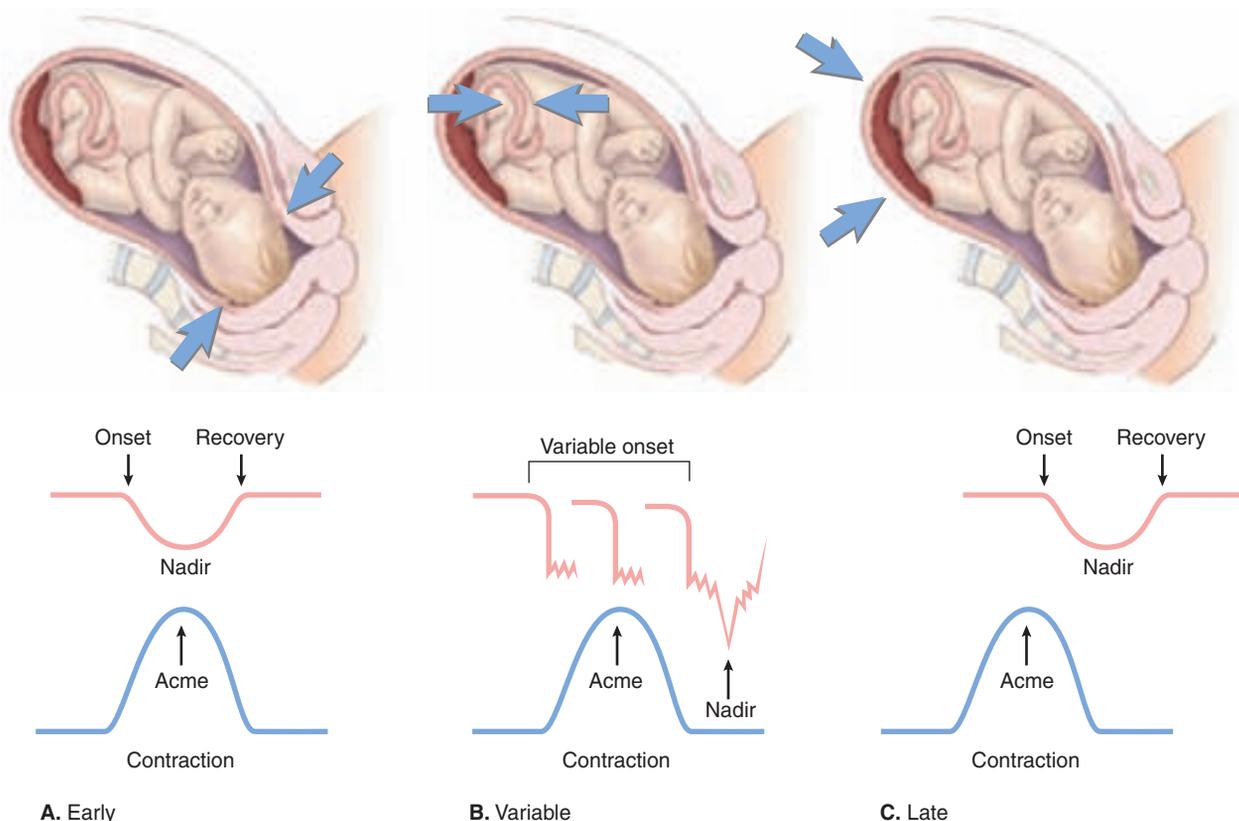
Periodic baseline changes are temporary, recurrent changes made in response to a stimulus such as a contraction. The FHR can demonstrate patterns of acceleration or deceleration in response to most stimuli. Fetal **accelerations** are transitory increases in the FHR above the baseline associated with sympathetic nervous stimulation. They are visually apparent, with elevations of FHR of at least 15 bpm above the baseline, and usually last longer than 15 seconds but not for longer than 2 minutes (King & Simpson, 2001). Their appearance provides evidence of fetal well-being and is generally considered reassuring and requires no interventions. Accelerations denote fetal movement and fetal well-being and are the basis for nonstress testing.

A **deceleration** is a transient fall in FHR caused by stimulation of the parasympathetic nervous system. Decelerations are described by their shape and association to a uterine contraction. They are classified as early, late, variable, and prolonged (Fig. 14-10).

Early decelerations are characterized by a gradual decrease in the FHR in which the nadir (lowest point) occurs at the peak of the contraction. They rarely decrease more than 30 to 40 bpm below the baseline. Early decelerations mirror the appearance of the uterine contraction

below it on the fetal tracing. They are most often seen during the active stage of any normal labor, during pushing, crowning, or vacuum extraction. They are thought to be a result of fetal head compression that results in a reflex vagal response with a resultant slowing of the FHR during uterine contractions. Early decelerations are not indicative of fetal distress and do not require intervention.

Late decelerations are transitory decreases in FHR that occur after a contraction begins. The FHR does not return to baseline levels until well after the contraction has ended. Delayed timing of the deceleration occurs, with the nadir of the uterine contraction. Late decelerations are associated with uteroplacental insufficiency, which occurs when blood flow within the intervillous space is decreased to the extent that fetal hypoxia exists (McKinney et al., 2005). Conditions that may decrease uteroplacental perfusion with resultant decelerations include maternal hypotension, gestational hypertension, placental aging secondary to diabetes and postmaturity, hyperstimulation via oxytocin infusion, maternal smoking, anemia, and cardiac disease. They imply some degree of fetal hypoxia. Repetitive late decelerations and late decelerations with decreasing baseline variability are nonreassuring signs. Box 14-2 highlights interventions for decelerations.



● Figure 14-10 Decelerations. (A) Early. (B) Variable. (C) Late.

BOX 14-2

INTERVENTIONS FOR NONREASSURING DECELERATIONS

If a patient develops a nonreassuring deceleration pattern such as late or variable decelerations:

- Notify the healthcare provider about the pattern and obtain further orders, making sure to document all interventions and their effects on the FHR pattern.
- Reduce or discontinue oxytocin as dictated by the facility's protocol, if it is being administered.
- Provide reassurance that interventions are being done to effect a pattern change.

Additional interventions specific for a late deceleration FHR pattern would include:

- Turning the client on her left side to increase placental perfusion
- Administering oxygen by mask to increase fetal oxygenation
- Increasing the IV fluid rate to improve intravascular volume
- Assessing client for any underlying contributing causes
- Providing reassurance that interventions are to effect pattern change

Specific interventions for a variable deceleration FHR pattern would include:

- Changing the client's position to relieve compression on the cord
- Providing reassurance that interventions are to effect pattern change
- Giving oxygen and IV fluids as ordered

Variable decelerations have an unpredictable shape on the FHR baseline, possibly demonstrating no consistent relationship to uterine contractions. The shape of variable decelerations may be U, V, or W, or they may not resemble other patterns (Feinstein et al., 2003). Variable decelerations usually occur abruptly with quick deceleration. They are the most common deceleration pattern found in the laboring woman and are usually transient and correctable (Garite, 2002). Variable decelerations are associated with cord compression. However, they become a nonreassuring sign when the FHR decreases to less than 60 bpm, persists at that level for at least 60 seconds, and is repetitive (ICSI, 2003). The pattern of variable deceleration consistently related to the contractions with a slow return to FHR baseline is also nonreassuring.

Prolonged decelerations are abrupt FHR declines of at least 15 bpm that last longer than 2 minutes but less than 10 minutes. The rate usually drops to less than 90 bpm. Many factors are associated with this pattern, including prolonged cord compression, abruptio placentae, cord prolapse, supine maternal position, vaginal examination, fetal blood sampling, maternal seizures, regional anes-

thesia, or uterine rupture (Mattson & Smith, 2004). Prolonged decelerations can be remedied by identifying the underlying cause and correcting it.

Combinations of FHR patterns obtained by electronic fetal monitoring during labor are not infrequent. Nonreassuring patterns are more significant if they are mixed and persist for long periods of time. Other nonreassuring patterns include prolonged late decelerations, absent or minimal variability, bradycardia or tachycardia, and prolonged variable decelerations lower than 60 bpm. The likelihood of fetal compromise is increased if various nonreassuring patterns coexist, particularly those associated with decreased baseline variability or abnormal contraction patterns (ICSI, 2003).

Other Fetal Assessment Methods

In situations suggesting the possibility of fetal compromise, such as inconclusive or nonreassuring FHR patterns, further ancillary testing such as fetal scalp sampling, fetal pulse oximetry, and fetal stimulation may be used to validate the FHR findings and assist in planning interventions.

Fetal Scalp Sampling

Fetal scalp sampling was developed as a means of measuring fetal distress in conjunction with electronic fetal monitoring to make critical decisions about the management of labor and to prevent unnecessary operative interventions resulting from the use of electronic fetal monitoring alone. Nonreassuring FHR patterns may not necessarily indicate fetal hypoxia or acidosis. Therefore, assessing fetal acid-base status through fetal scalp sampling may help to prevent needless surgical intervention.

A sample of fetal scalp blood is obtained to measure the pH. Sampling requires that the woman have ruptured membranes, cervical dilation of a least 3 to 5 cm, and a vertex presentation at -1 station (Torgersen, 2004). Normal fetal blood pH is 7.25 to 7.35. When the fetal scalp pH is below 7.15, the majority of neonates will have an Apgar score of less than 6 (Torgersen, 2004).

During the past decade, the use of fetal scalp sampling has decreased, being replaced by less invasive techniques that yield similar information.

Fetal Oxygen Saturation Monitoring (Fetal Pulse Oximetry)

Fetal pulse oximetry measures fetal oxygen saturation directly and in real time. It is used with electronic fetal monitoring as an adjunct method of assessment when the FHR pattern is nonreassuring or inconclusive. Normal oxygen saturation of a healthy fetus is 30% to 70% (Sisk, 2002). If the fetal oxygen saturation is reassuring (a trend of >30% between contractions), unnecessary cesarean births, invasive procedures such as fetal blood sampling, and operative vaginal births can be minimized (Simpson,

2003). Any reduction in unnecessary interventions during labor and birth has the potential to improve maternal and fetal outcomes and reduce costs.

Adequate maintenance of fetal oxygenation is necessary for fetal well-being. Fetal oxygen saturation monitoring is used for a singleton term fetus in a vertex presentation, at a -2 station or below, and with a nonreassuring FHR pattern. In addition, the fetal membranes must be ruptured and the cervix dilated at least 2 cm (Simpson & Porter, 2001). A soft sensor is introduced through the dilated cervix and placed on the cheek, forehead, or temple of the fetus. It is held in place by the uterine wall. The sensor then is attached to a special adaptor on the fetal monitor that provides a real-time recording that is displayed on the uterine activity panel of the tracing. It is a noninvasive, safe, and accurate method for assessing fetal oxygenation.

The fetal pulse oximetry traces along the contraction portion of the monitoring strip, so it is easy to see how the saturation changes with the contraction. This adjunct test can help support decisions to allow labor to continue or to intervene surgically. Observing the trend of oxygen saturation on the tracing and documenting the values on the labor flow sheet or other medical record forms is crucial. The physician or midwife must be notified if the fetal oxygen saturation becomes nonreassuring ($<30\%$ between contractions) in conjunction with a nonreassuring FHR pattern. Ongoing communication is needed between the nurse and the primary care provider to enhance the maternal-fetus status.

Fetal Stimulation

An indirect method used to evaluate fetal oxygenation and acid-base balance to identify fetal hypoxia is fetal scalp stimulation and vibroacoustic stimulation. If the fetus does not have adequate oxygen reserves, carbon dioxide builds up, leading to acidemia and hypoxemia. These metabolic states are reflected in nonreassuring FHR patterns as well as fetal inactivity. Fetal stimulation is performed to promote fetal movement with the hope that FHR accelerations will accompany the movement.

Fetal movement can be stimulated with a vibroacoustic stimulator (artificial larynx) applied to the woman's lower abdomen and turned on for a few seconds to produce sound and vibration or by tactile stimulation via pelvic examination and stimulation of the fetal scalp with the gloved fingers. A well-oxygenated fetus will respond when stimulated (tactile or by noise) by moving in conjunction with an acceleration of 15 bpm above the baseline heart rate that lasts at least 15 seconds. This FHR acceleration reflects a pH of more than 7 and a fetus with an intact central nervous system. Fetal scalp stimulation is not done if the fetus is preterm, or if the woman has an intrauterine infection, a diagnosis of placenta previa (which could lead to hemorrhage), or a fever (which increases the risk of an ascending infection) (McKinney et al., 2005).

Comfort Promotion and Pain Management

Pain during labor is a universal experience, although the intensity of the pain may vary. Although labor and childbirth are viewed as natural processes, both can produce significant pain and discomfort. The physical causes of pain during labor include cervical stretching, hypoxia of the uterine muscle due to a decrease in perfusion during contractions, pressure on the urethra, bladder, and rectum, and distention of the muscles of the pelvic floor (Leonard, 2002). A woman's pain perception can be influenced by her previous experiences with pain, fatigue, pain anticipation, positive or negative support system, labor and birth environment, cultural expectations, and level of emotional stress and anxiety (Hodnett, 2002a).

The techniques used to manage the pain of labor vary according to geography and culture. For example, some Appalachian women believe that placing a hatchet or knife under the bed of a laboring woman may help "cut the pain of childbirth" and a woman from this background may wish to do so in the hospital setting (Stephens, 2003). Cherokee, Hmong, and Japanese women will often remain quiet during labor and birth and not complain of pain because outwardly expressing pain is not appropriate in their cultures. Never interpret their quietness as freedom from pain (Moore & Moos, 2003).

Today, women have many safe nonpharmacologic and pharmacologic choices for the management of pain during labor and birth, which may be used separately or in combination with one another.

Nurses are in an ideal position to provide childbearing women with balanced, clear, concise information regarding effective nonpharmacologic and pharmacologic measures to relieve pain. Pain management standards issued by JCAHO mandate that pain be assessed in all clients admitted to a healthcare facility. Thus, it is important for nurses to be knowledgeable about the most recent scientific research on labor pain-relief modalities, to make sure that accurate and unbiased information about effective pain-relief measures is available to laboring women, to be sure that the woman determines what is an acceptable labor pain level for her, and to allow the woman the choice of pain-relief method.

Nonpharmacologic Measures

Nonpharmacological measures may include continuous labor support, hydrotherapy, ambulation and position changes, acupuncture and acupressure, attention focusing and imagery, therapeutic touch and massage, and breathing techniques and effleurage. Most of these methods are based on the "gate control" theory of pain, which proposes that local physical stimulation can interfere with

pain stimuli by closing a hypothetical gate in the spinal cord, thus blocking pain signals from reaching the brain (Engstrom, 2004). It has long been a standard of care for labor nurses to first provide or encourage a variety of nonpharmacologic measures before moving to the pharmacologic interventions.

Nonpharmacologic measures are usually simple, safe, and inexpensive to use. Many of these measures are taught in childbirth classes, and women should be encouraged to try a variety of methods prior to the real labor. Many of the measures need to be practiced for best results and coordinated with the partner/coach. The nurse provides support and encouragement for the woman and her partner using nonpharmacologic methods. Although women can't consciously direct the contractions occurring during labor, they can control how they respond to them, thereby enhancing their feelings of control.

Continuous Labor Support

Continuous labor support involves offering a sustained presence to the laboring woman by providing emotional support, comfort measures, advocacy, information and advice, and support for the partner (Trainor, 2002). This continuous presence can be provided by a woman's family, a midwife, a nurse, a doula, or anyone else close to the woman. A support person can assist the woman to ambulate, reposition herself, and use breathing techniques. A support person can also aid with the use of acupressure, massage, music therapy, or therapeutic touch. During the natural course of childbirth, a laboring woman's functional ability is limited secondary to pain, and she often has trouble making decisions. The support person can help make them based on his or her knowledge of the woman's birth plan and personal wishes.

Research has validated the value of continuous labor support versus intermittent support in terms of lower operative deliveries, cesarean births, and requests for pain medication (Hodnett, 2002b; Hunter, 2002). The human presence is of immeasurable value to make the laboring woman feel secure.

Hydrotherapy

Hydrotherapy is a nonpharmacologic measure in which the woman immerses herself in warm water for relaxation and relief of discomfort. Upon entering the warm water, the warmth and buoyancy help to release muscle tension and can impart a sense of well-being (Primeau et al., 2003). Warm water provides soothing stimulation of nerves in the skin, promoting vasodilatation, reversal of sympathetic nervous response, and a reduction in catecholamines (Leeman et al., 2003a). Contractions are usually less painful in warm water because the warmth and buoyancy of the water have a relaxing effect.

There are a wide range of hydrotherapy options available, from ordinary bathtubs to whirlpool baths and showers, combined with low lighting and music.

Many hospitals provide showers and whirlpool baths for laboring women for pain relief. However, hydrotherapy is more commonly practiced in birthing centers managed by midwives. The recommendation for initiating hydrotherapy is that that women be in active labor (>5 cm dilated) to prevent the slowing of labor contractions secondary to muscular relaxation. The woman's membranes can be intact or ruptured. Women are encouraged to stay in the bath or shower as long as they feel they are comfortable. The water temperature should not exceed body temperature, and the bath time typically is limited to 1 to 2 hours (Simkin & O'Hara, 2002).

Hydrotherapy is an effective pain-management option for many women. Women who are experiencing a healthy pregnancy can be offered this option, but the potential benefits or risks to the woman are still not known (Campbell, 2004).

Ambulation and Position Changes

Ambulation and position changes during labor are another extremely useful comfort measure. Historically, women adopted a variety of positions during labor, rarely using the recumbent position until recently. The medical profession has favored recumbent positions during labor, but without evidence to demonstrate their appropriateness (Chalk, 2004).

Changing position frequently (every 30 minutes or so)—sitting, walking, kneeling, standing, lying down, getting on hands and knees, and using a birthing ball—helps relieve pain (Fig. 14-11). Position changes also may help to speed labor by adding benefits of gravity and changes to the shape of the pelvis. Research reports that position and frequency of position change have a profound effect on uterine activity and efficiency. Allowing the woman to obtain a position of comfort frequently facilitates a favorable fetal rotation by altering the alignment of the presenting part with the pelvis. As the mother continues to change position based on comfort, the optimal presentation is afforded (Gilbert & Harmon, 2003). Supine and sitting positions should be avoided, since they may interfere with labor progress and can cause compression of the vena cava and decrease blood return to the heart.

Swaying from side to side, rocking, or other rhythmic movements may also be comforting. If labor is progressing slowly, ambulating may speed it up again. Upright positions such as walking, kneeling forward, or doing the lunge on the birthing ball give most women a greater sense of control and active movement than just lying down. Table 14-2 highlights some of the more common positions that can be used during labor and birth.

Acupuncture and Acupressure

Acupuncture and acupressure can be used to bring about pain relief during labor. Although controlled research studies of these methods are limited, there is adequate evi-



● **Figure 14-11** Various positions for use during labor. (A) Ambulation. (B) Leaning forward. (C) Sitting in a chair. (D) Using a birthing ball.

dence that both are useful in relieving pain associated with labor and birth. However, both methods require a trained, certified clinician, and such a person is not available in many birth facilities (Skilnand et al., 2002).

Acupuncture involves stimulating key trigger points with needles. This form of Chinese medicine has been practiced for approximately 3,000 years. Classical Chinese teaching holds that throughout the body there are meridians or channels of energy (*qi*) that when in balance regulate body functions. Pain reflects an imbalance or obstruction of the flow of energy. The purpose of acupuncture is to restore *qi*, thus diminishing pain (Eappen & Robbins,

2002). Stimulating the trigger points causes the release of endorphins, reducing the perception of pain.

Acupressure involves the application of a firm finger or massage at the same trigger points to reduce the pain sensation. The amount of pressure is important. The intensity of the pressure is determined by the needs of the woman. Holding and squeezing the hand of a woman in labor may trigger the point most commonly used for both techniques (Engstrom, 2004). Some acupressure points are found along the spine, neck, shoulder, toes, and soles of the feet (Lowdermilk & Perry, 2004).

Table 14-2 Common Positions for Use During Labor and Birth

Standing	<ul style="list-style-type: none"> • Takes advantage of gravity during and between contractions • Makes contractions feel less painful and be more productive • Helps fetus line up with angle of maternal pelvis • Helps to increase urge to push in second stage of labor
Walking	<ul style="list-style-type: none"> • Has the same advantages as standing • Causes changes in the pelvic joints, helping the fetus move through the birth canal
Standing and leaning forward on partner, bed, birthing ball	<ul style="list-style-type: none"> • Has the same advantages as standing • Is a good position for a backrub • May feel more restful than standing • Can be used with electronic fetal monitor
Slow dancing (standing with woman's arms around partner's neck, head resting on his chest or shoulder, with his hands rubbing your lower back; sway to music and breathe in rhythm if it helps)	<ul style="list-style-type: none"> • Has the same advantages as walking • Back pressure helps relieve back pain • Rhythm and music help you relax and provide comfort
The lunge (standing facing a straight chair with one foot on the seat with knee and foot to the side; bending raised knee and hip, and lunging sideways repeatedly during a contraction, holding each lunge for 5 seconds; partner holds chair and helps with balance)	<ul style="list-style-type: none"> • Widens one side of the pelvis (the side toward lunge) • Encourages rotation of baby • Can also be done in a kneeling position
Sitting upright	<ul style="list-style-type: none"> • Helps promote rest • Has more gravity advantage than lying down • Can be used with electronic fetal monitor
Sitting on toilet or commode	<ul style="list-style-type: none"> • Has the same advantages as sitting upright • May help relax the perineum for effective bearing down
Semi-sitting (setting the head of the bed at a 45-degree angle with pillows used for support)	<ul style="list-style-type: none"> • Has the same advantages as sitting upright • Is an easy position if on a bed
Rocking in a chair	<ul style="list-style-type: none"> • Has the same advantages as sitting upright • May help speed labor (rocking movement)
Sitting, leaning forward with support	<ul style="list-style-type: none"> • Has the same advantages as sitting upright • Is a good position for back rubbing
On all fours, on your hands and knees	<ul style="list-style-type: none"> • Helps relieve backache • Assists rotation of baby in posterior position • Allows for pelvic rocking and body movement • Relieves pressure on hemorrhoids • Allows for vaginal exams • Is sometimes preferred as a pushing position by women with back labor
Kneeling, leaning forward with support on a chair seat, the raised head of the bed, or on a birthing ball	<ul style="list-style-type: none"> • Has the same advantages as all-fours position • Puts less strain on wrists and hands
Side-lying	<ul style="list-style-type: none"> • Is a very good position for resting and convenient for many kinds of medical interventions • Helps lower elevated blood pressure • May promote progress of labor when alternated with walking • Is useful to slow a very rapid second stage • Takes pressure off hemorrhoids • Facilitates relaxation between contractions

Table 14-2 Common Positions for Use During Labor and Birth (continued)**Squatting**

Supported squat (leaning back against partner, who supports woman under the arms and takes the entire woman's weight; standing up between contractions)

Dangle (partner sitting high on bed or counter with feet supported on chairs or footrests and thighs spread; woman leaning back between partner's legs, placing flexed arms over partner's thighs; partner gripping sides with his thighs; woman lowering herself and allowing partner to support her full weight; standing up between contractions)

- May relieve backache
- Takes advantage of gravity
- Requires less bearing-down effort
- Widens pelvic outlet
- May help fetus turn and move down in a difficult birth
- Helps if the woman feels no urge to push
- Allows freedom to shift weight for comfort
- Offers an advantage when pushing, since upper trunk presses on the top of the uterus
- Requires great strength in partner
- Lengthens trunk, allowing more room for fetus to maneuver into position
- Lets gravity help
- Has the same advantages of a supported squat
- Requires less physical strength from the partner

Sources: Simkin, 2002; Simkin, 2003; Simkin & Ancheta, 2000; McKinney et al., 2005.

Attention Focusing and Imagery

Attention focusing and imagery uses many of the senses and the mind to focus on stimuli. The woman can focus on tactile stimuli such as touch, massage, or stroking. She may focus on auditory stimuli such as music, humming, or verbal encouragement. Visual stimuli might be any object in the room, or the woman can imagine the beach, a mountaintop, a happy memory, or even the contractions of the uterine muscle pulling the cervix open and the fetus pressing downward to open the cervix. Some women focus on a particular mental activity such as a song, a chant, counting backwards, or a Bible verse. Breathing, relaxation, positive thinking, and positive visualization work well for mothers in labor. The use of these techniques keeps the sensory input perceived during the contraction from reaching the pain center in the cortex of the brain (Simkin, 2002).

Therapeutic Touch and Massage

Therapeutic touch and massage use the sense of touch to promote relaxation and pain relief. Massage works as a form of pain relief by increasing the production of endorphins in the body. Endorphins reduce the transmission of signals between nerve cells and thus lower the perception of pain (Duddridge, 2002). In addition, touching and massage offer the woman a distraction from discomfort.

Therapeutic touch is based on the premises that the body contains energy fields that lead to either good or ill health and that the hands can be used to redirect the energy fields that lead to pain (Engstrom, 2004). To be done cor-

rectly, this technique must be learned and practiced. Some women prefer a light touch, while others find a firmer touch more soothing. Massage of the neck, shoulders, back, thighs, feet, and hands can be very comforting. The use of firm counterpressure in the lower back or sacrum is especially helpful for back pain during contractions (Fig. 14-12). Contraindications for massage include skin rashes, varicose veins, bruises, or infections (Leonard, 2002).

Effleurage is a light, stroking, superficial touch of the abdomen, in rhythm with breathing during contractions. It is used as a relaxation and distraction technique from discomfort. The external fetal monitor belts may interfere with her ability to accomplish this.

Breathing Techniques

Breathing techniques are effective in producing relaxation and pain relief through the use of distraction. If the woman is concentrating on slow-paced rhythmic breathing, she isn't likely to fully focus on contraction pain. Breathing techniques are often taught in childbirth education classes (see Chapter 12 for additional information).

Breathing techniques use controlled breathing to reduce the pain experienced through a stimulus-response conditioning. The woman selects a focal point within her environment to stare at during the first sign of a contraction. This focus creates a visual stimulus that goes directly to her brain. The woman takes a deep cleansing breath, which is followed by rhythmic breathing. Verbal commands from her partner supply an ongoing auditory stimulus to her brain. Effleurage can be combined with the



● Figure 14-12 Nurse massaging the client's back during a contraction while she ambulates during labor.

breathing to provide a tactile stimulus, all blocking pain sensations to her brain.

There are five levels of breathing a woman can use depending on the intensity of each contraction:

- First level: slow chest breathing involves 6 to 12 full respirations per minute; used in early labor; starting off and ending with a cleansing breath, which is taking a large volume of air into the lungs and letting it out slowly
- Second level: breathing heavy enough to expand the rib cage but light enough so the diaphragm barely moves; rate can be up to 40 breaths per minute; used during labor when cervical dilation is 4 to 6 cm
- Third level: shallow, sternal breathing, usually at a rate of 50 to 70 breaths per minute; used during transition phase of labor
- Fourth level: pant-blow pattern of breathing involves taking three to four quick breaths in and out and then forcefully exhaling
- Fifth level: continuous chest panting involves taking shallow breaths at a rate of about 60 breaths per minute; used during strong contractions to prevent pushing too early

The last two levels of breathing patterns are used when the previous level is no longer effective. The levels progress with the discomfort of the contractions.

Pharmacologic Measures

With varying degrees of success, generations of women have sought ways to relieve the pain of childbirth. Pharma-

cologic pain relief during labor includes systemic analgesia and regional or local anesthesia. Women have seen dramatic changes in pharmacologic pain management options over the years. Methods have evolved from biting down on a stick to a more complex pharmacologic approach such as epidural/intrathecal analgesia. Systemic analgesia and regional analgesia/anesthesia have become less common, while the use of newer neuraxial analgesia/anesthesia techniques involving minimal motor blockade have become more popular. **Neuraxial analgesia/anesthesia** is the administration of analgesic (opioids) or anesthetic (medication capable of producing a loss of sensation in an area of the body) agents, either continuously or intermittently, into the epidural or intrathecal space to relieve pain (Poole, 2003a). Low-dose and ultra-low-dose epidural analgesia, spinal analgesia, and combined spinal-epidural analgesia have replaced the once “traditional” epidural for labor (Poole, 2003).

The shift in pain management allows a woman to be an active participant during labor. Regardless of which approach is used during labor, the woman has the right to choose the methods of pain control that will best suit her and meet her needs.

Systemic Analgesia

Systemic analgesia involves the use of one or more drugs administered orally, intramuscularly, or intravenously that become distributed throughout the body via the circulatory system. Depending on which administration routine is used, the therapeutic effect of pain relief can occur within minutes and last for several hours. The most important complication associated with the use of this class of drugs is respiratory depression. Therefore, women given these drugs require careful monitoring. Opioids given close to the time of birth can cause central nervous system depression in the newborn, necessitating the administration of naloxone (Narcan) to reverse the depressant effects of the opioids.

Several drug categories may be used for systemic analgesia:

- Ataractics: such as hydroxyzine (Vistaril) or promethazine (Phenergan)
- Barbiturates: such as secobarbital (Seconal) or pentobarbital (Nembutal)
- Benzodiazepines: such as diazepam (Valium) or midazolam (Versed)
- Opioids: such as butorphanol (Stadol), nalbuphine (Nubain), meperidine (Demerol), or fentanyl (Sublimaze)

Drug Guide 14-1 highlights some of the major drugs used for systemic analgesia.

Systemic analgesics are typically administered parenterally, usually through an existing intravenous (IV) line. Nearly all medications given during labor cross the placenta and have a depressant effect on the fetus; there-

Drug Guide 14-1 Common Agents Used for Systemic Analgesia

Type	Drug	Comments
Opioids	Morphine 2–5 mg IV	May be given IV, intrathecally, or epidurally Rapidly crosses the placenta Can cause maternal and neonatal CNS depression Decreases uterine contractions
	Meperidine (Demerol) 25–50 mg IV	May be given IV or epidurally with maximal fetal uptake 2–3 hours after administration Can cause CNS depression Decreases fetal variability
	Butorphanol (Stadol) 1 mg IV q 3–4h	Is given IV Is rapidly transferred across the placenta Causes neonatal respiratory depression
	Nalbuphine (Nubain) 10 mg IV	Is given IV Causes less maternal nausea and vomiting Causes decreased FHR variability, fetal bradycardia and respiratory depression
	Fentanyl (Sublimaze) 25–50 mcg IV	Is given IV or epidurally Can cause maternal hypotension, maternal and fetal respiratory depression Rapidly crosses placenta
Ataractics	Hydroxyzine (Vistaril) 50 mg IM	Does not relieve pain but reduces anxiety and potentiates opioid analgesic effects Is used to decrease nausea and vomiting
	Promethazine (Phenergan) 25 mg IV	Is used for antiemetic effect when combined with opioids Causes sedation and reduces apprehension May contribute to maternal hypotension and neonatal depression
Benzodiazepines	Diazepam (Valium) 2–5 mg IV	Is given to enhance pain relief of opioid and cause sedation May be used to stop eclamptic seizures Decreases nausea and vomiting Can cause newborn depression; therefore, lowest possible dose should be used
	Midazolam (Versed) 1–5 mg IV	Is not used for analgesic but amnesia effect Is used as adjunct for anesthesia Is excreted in breast milk
Barbiturates	Secobarbital (Seconal) 100 mg PO/IM	Causes sedation Is used in very early labor to alter a dysfunctional pattern
	Pentobarbital (Nembutal) 100 mg PO/IM	Is not used for pain relief in active labor Crosses placenta and is secreted in breast milk

Sources: Primeau, Lacey, & Crotty, 2003; Poole, 2003b; Florence & Palmer, 2003; Pitter & Preston, 2001; Spratto & Woods, 2004; Mahlmeister, 2003.

fore, it is important for the woman to receive the least amount of systemic medication as possible to relieve her discomfort so that it does not cause any harm to the fetus (Florence & Palmer, 2003). Historically opioids have been administered by nurses, but in the past decade there has been increasing use of client-controlled intravenous analgesia (patient-controlled analgesia [PCA]). With this system, the woman is given a button connected to a computerized pump on the IV line. When the woman desires analgesia, she presses the button and the pump delivers a

preset amount of medication. This system provides the woman with a sense of control over her own pain management and active participation in the childbirth process.

Ataractics

The ataractic group of medications is used in combination with an opioid to decrease nausea and vomiting and lessen anxiety. These adjunct drugs help potentiate the effectiveness of the opioid so that a lesser dose can be given. They may also be used to increase sedation. Promethazine

(Phenergan) can be given IV, but hydroxyzine (Vistaril) must be given by mouth or by intramuscular injection into a large muscle mass. Neither drug affects the progress of labor, but either may cause a decrease in FHR variability and possible newborn depression (Poole, 2003b).

Barbiturates

The barbiturate drug group is used only in early labor or in a prolonged latent phase that produces enough discomfort that the woman cannot sleep. Barbiturates are given orally or intramuscularly to produce a light sleep to alter a dysfunctional labor pattern or to calm a very anxious woman in early labor. The goal in giving a barbiturate is to promote therapeutic rest for a few hours to enhance the woman's ability to cope with active labor. These drugs cross the placenta and cause central nervous system depression in the newborn (Poole, 2003a).

Benzodiazepines

Benzodiazepines are used for minor tranquilizing and sedative effects. Diazepam (Valium) also is given IV to stop seizures due to pregnancy-induced hypertension. However, it is not used during labor itself. It can be administered to calm a woman who is out of control, thereby enabling her to relax enough so that she can participate effectively during her labor process rather than fighting against it. Lorazepam (Ativan) can also be used for its tranquilizing effect, but increased sedation is experienced with this medication (Bricker & Lavender, 2002). Midazolam (Versed), also given IV, produces good amnesia but no analgesia. It is most commonly used as an adjunct for anesthesia. Diazepam and midazolam cause central nervous system depression for both the woman and the newborn.

Opioids

Opioids are morphine-like medications that are most effective for the relief of moderate to severe pain. Opioids typically are administered IV. Of all of the synthetic opioids (butorphanol [Stadol], nalbuphine [Nubain], fentanyl [Sublimaze], and meperidine [Demerol]), meperidine is the most commonly used opioid for the management of pain during labor. Opioids are associated with newborn respiratory depression, decreased alertness, inhibited sucking, and a delay in effective feeding (Leeman et al., 2003b).

Opioids decrease the transmission of pain impulses by binding to receptor site pathways that transmit the pain signals to the brain. The effect is increased tolerance to pain and respiratory depression related to a decrease in sensitivity to carbon dioxide (Skidmore-Roth, 2004).

All opioids are considered good analgesics. However, respiratory depression can occur in the mother and fetus depending on the dose given. They may also cause a decrease in FHR variability identified on the fetal monitor strip. This FHR pattern change is usually transient. Other systemic side effects include nausea, vomiting, pruritus,

delayed gastric emptying, drowsiness, hypoventilation, and newborn depression. To reduce the incidence of newborn depression, birth should occur within 1 hour or after 4 hours of administration to prevent the fetus from receiving the peak concentration (Poole, 2003b).

Opioid antagonists such as naloxone (Narcan) are given to reverse the effects of the central nervous system depression, including respiratory depression, caused by opioids. Opioid antagonists also are used to reverse the side effects of neuraxial opioids, such as pruritus, urinary retention, nausea, and vomiting, without significantly decreasing analgesia (Poole, 2003b).

Consult a current drug guide for more specifics on these drug categories.

Regional Analgesia/Anesthesia

Regional analgesia/anesthesia provides pain relief without loss of consciousness. It involves the use of local anesthetic agents, with or without added opioids, to bring about pain relief or numbness through the drug's effects on the spinal cord and nerve roots. Obstetric regional analgesia generally refers to a partial or complete loss of pain sensation below the T8 to T10 level of the spinal cord (ACOG, 2002).

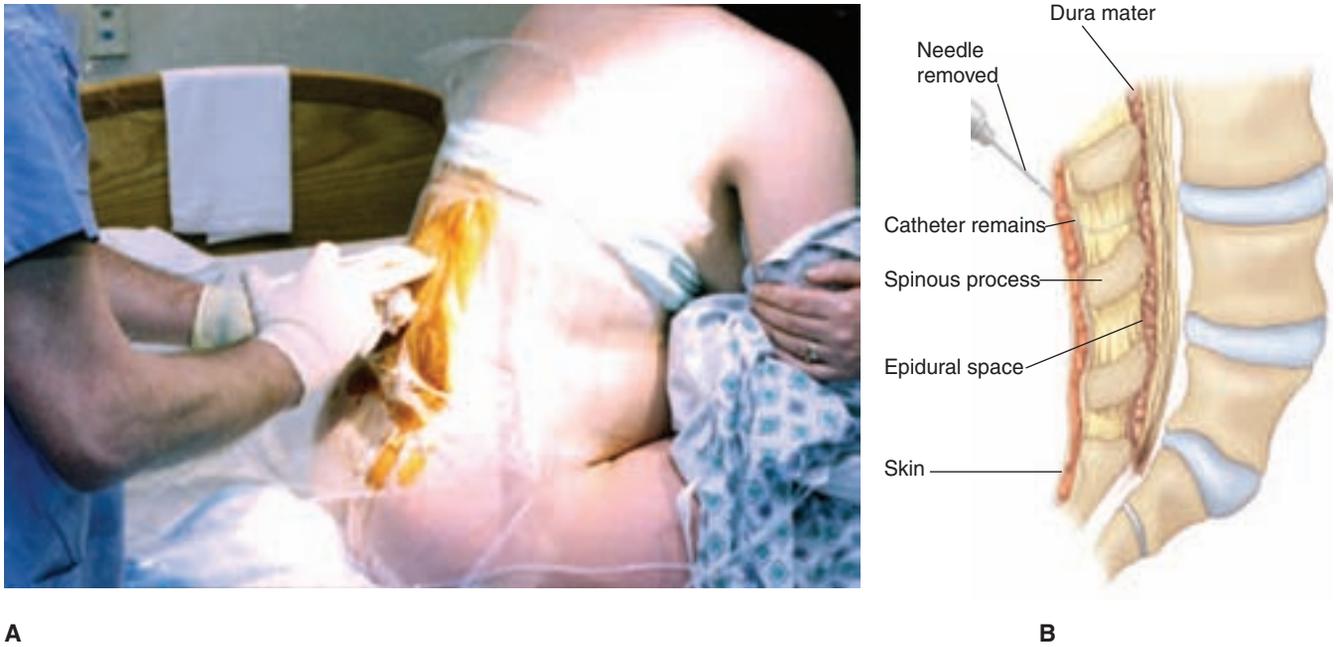
The routes for regional pain relief include epidural block, combined spinal-epidural block, local infiltration, pudendal block, and intrathecal (spinal) analgesia/anesthesia. Local and pudendal routes are used during birth for episiotomies; epidural and intrathecal routes are used for pain relief during active labor and birth. The major advantage of regional pain-management techniques is that the woman can participate in the birthing process and still have good pain control.

Epidural Block

Approximately 60% of laboring women in the United States receive an epidural block for pain relief during labor. In urban areas, many hospitals approach 90% use of epidurals (Eltzschig et al., 2003).

An epidural block involves the injection of a drug into the epidural space, which is located outside the dura mater between the dura and the spinal canal. The epidural space is typically entered through the third and fourth lumbar vertebrae with a needle, and a catheter is threaded into the epidural space. The needle is removed and the catheter is left in place to allow for continuous infusion or intermittent injections of medicine (Fig. 14-13). An epidural block provides analgesia and anesthesia and can be used for both vaginal and cesarean births. It has evolved from a regional block producing total loss of sensation to analgesia with minimal blockade. The effectiveness of epidural analgesia depends on the technique and medications used. It is usually started after labor is well established, typically when cervical dilation is greater than 5 cm.

Theoretically, epidural local anesthetics could block 100 percent of labor pain if used in large volumes and high



● **Figure 14-13** Epidural catheter insertion. **(A)** A needle is inserted into the epidural space. **(B)** A Catheter is threaded into the epidural space; the needle is then removed. The catheter allows medication to be administered intermittently or continuously to relieve pain during labor and childbirth.

concentrations. However, pain relief is balanced against other goals such as walking during the first stage of labor, pushing effectively in the second stage, and minimizing maternal and fetal side effects.

An epidural is contraindicated for women with a previous history of spinal surgery or spinal abnormalities, coagulation defects, infections, and hypovolemia. It also is contraindicated for the woman who is receiving anti-coagulation therapy.

Complications include nausea and vomiting, hypotension, fever, pruritus, intravascular injection, and respiratory depression. Effects on the fetus during labor include fetal distress secondary to maternal hypotension (Mayberry et al., 2002). Ensuring that the woman avoids a supine position after an epidural catheter has been placed will help to minimize hypotension.

Changes in epidural drugs and techniques have been made to optimize pain control while minimizing side effects. Today most women receive a continuous lumbar epidural infusion of a local anesthetic, typically a drug whose name ends in “caine,” and an opioid. To decrease motor blockade, bupivacaine (Sensorcaine) and ropivacaine (Naropin) have replaced lidocaine (Xylocaine), and drug concentrations have been lowered (Caton et al., 2002).

The addition of opioids, such as fentanyl or morphine, to the local anesthetic helps decrease the amount of motor block obtained. Continuous infusion pumps are used to administer the epidural analgesia, allowing the woman to be in control and administer a bolus dose on demand (Mitchell, 2002).

Combined Spinal-Epidural Analgesia

Another epidural technique is combined spinal-epidural (CSE) analgesia. This technique involves inserting the epidural needle into the epidural space and subsequently inserting a small-gauge spinal needle through the epidural needle into the subarachnoid space. An opioid, without a local anesthetic, is injected into this space. The spinal needle is then removed and an epidural catheter is inserted for later use.

CSE is advantageous because of its rapid onset of pain relief (within 3 to 5 minutes) that can last up to 3 hours. It also allows the woman’s motor function to remain active. Her ability to bear down during the second stage of labor is preserved because the pushing reflex is not lost, and her motor power remains intact. The CSE technique provides greater flexibility and reliability for labor than either spinal or epidural analgesia alone (Landau, 2002). When compared with traditional epidural or spinal analgesia, which often keeps the woman lying in bed, CSE allows her to ambulate (“walking epidural”) (Leeman et al., 2003b). Ambulating during labor provides several benefits: it may help control pain better, shorten the first stage of labor, increase the intensity of the contractions, and decrease the possibility of an operative vaginal or cesarean birth.

Although women can walk with CSE, they often choose not to because of sedation and fatigue. Often healthcare providers don’t encourage or assist women to ambulate for fear of injury (Mayberry et al., 2002). Currently, anesthesiologists are performing walking epidurals using continuous infusion techniques as well as CSE

and patient-controlled epidural analgesia (PCEA) (Pitter & Preston, 2001).

Complications include maternal hypotension, intravascular injection, accidental intrathecal blockade, post-dural puncture headache, inadequate or failed block, and pruritus. Hypotension and associated FHR changes are managed with maternal positioning (semi-Fowler's position), intravenous hydration, and supplemental oxygen (Lieberman & O'Donoghue, 2002).

Patient-Controlled Epidural Analgesia

Patient-controlled epidural analgesia (PCEA) involves the use of an indwelling epidural catheter with an infusion of medication and a programmed pump that allows the woman to control the dosing. This method allows the woman to have a sense of control over her pain and reach her own individually acceptable analgesia level. When compared with the traditional epidural analgesia, PCEA provides equivalent analgesia with lower anesthetic use, lower rates of supplementation, and higher client satisfaction (Paech, 2000).

With PCEA, the woman uses a hand-held device connected to an analgesic agent that is attached to an epidural catheter (Fig. 14-14). When she pushes the button, a bolus dose of agent is administered via the catheter to reduce her pain. This method allows her to manage her pain at will without having to ask a staff member to provide pain relief.

Local Infiltration

Local infiltration involves the injection of a local anesthetic, such as lidocaine, into the superficial perineal nerves to numb the perineal area. This technique is done by the physician or midwife just before performing an **episiotomy** (surgical incision into the perineum to facilitate birth) or suturing a laceration. Local infiltration does not alter the pain of uterine contractions, but it does numb the immediate area of the episiotomy or laceration. Local infiltration does not cause side effects for the woman or her newborn.



● Figure 14-14 Using a PCEA pump. Here the client holds the button that delivers a dose of medication.

Pudendal Nerve Block

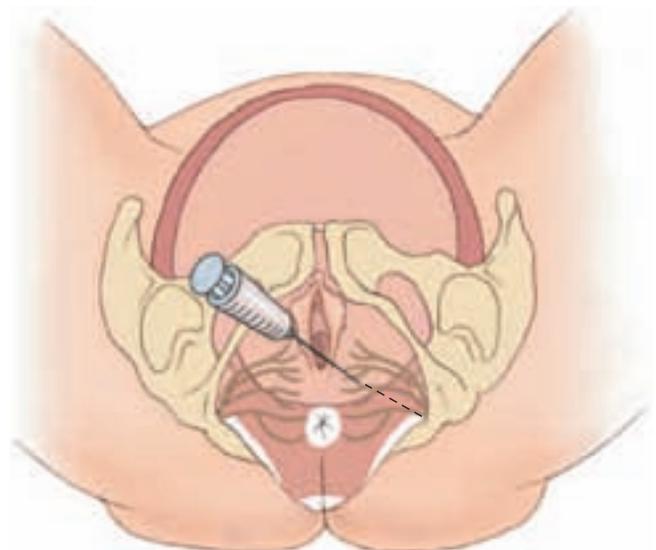
A pudendal nerve block refers to the injection of a local anesthetic agent (e.g., bupivacaine, ropivacaine) into the pudendal nerves near each ischial spine. It provides pain relief in the lower vagina, vulva, and perineum (Fig. 14-15).

A pudendal block is used for the second stage of labor, an episiotomy, or an operative vaginal birth with outlet forceps or vacuum extractor. It must be administered about 15 minutes before it would be needed to ensure its full effect. A transvaginal approach is generally used to inject an anesthetic agent at or near the pudendal nerve branch. Neither maternal nor fetal complications are common.

Spinal (Intrathecal) Analgesia/Anesthesia

The spinal (intrathecal) pain-management technique involves injection of an anesthetic “caine” agent, with or without opioids, into the subarachnoid space to provide pain relief during labor or cesarean birth. The contraindications are similar to those for the epidural block. Adverse reactions for the woman include hypotension and spinal headache.

The subarachnoid injection of opioids alone, a technique termed *intrathecal narcotics*, has been gaining popularity since it was introduced in the 1980s. A narcotic is injected into the subarachnoid space, providing rapid pain relief while still maintaining motor function and sensation (Breslin & Lucas, 2003). An intrathecal narcotic is given during the active phase (>5 cm dilation) of labor. Compared with epidural blocks, intrathecal narcotics are easy to administer, provide rapid-onset pain relief, are less likely to cause newborn respiratory depression, and do not cause motor blockade (Fontaine et al., 2002). Although pain relief is rapid with this technique, it is limited by the narcotic's duration of action, which may be only a few hours and not last through the labor. Additional pain measures may be needed to sustain pain management.



● Figure 14-15 Pudendal nerve block.

General Anesthesia

General anesthesia is typically reserved for emergency cesarean births when there is not enough time to provide spinal or epidural anesthesia or if the woman has a contraindication to the use of regional anesthesia. It can be started quickly and causes a rapid loss of consciousness. General anesthesia can be administered by IV injection, inhalation of anesthetic agents, or both. Commonly, thiopental, a short-acting barbiturate, is given IV to produce unconsciousness. This is followed by administration of a muscle relaxant. After the woman is intubated, nitrous oxide and oxygen are administered. A volatile halogenated agent may also be administered to produce amnesia (Hawkins et al., 2002).

All anesthetic agents cross the placenta and affect the fetus. The primary complication with general anesthesia is fetal depression, along with uterine relaxation and potential maternal vomiting and aspiration.

Although the anesthesiologist or nurse anesthetist administers the various general anesthesia agents, the nurse needs to be knowledgeable about the pharmacologic aspects of the drugs used and must be aware of airway management. Ensure that the woman is NPO and has a patent IV. In addition, administer a non-particulate (clear) oral antacid (e.g., Bicitra or sodium citrate) or a proton pump inhibitor (Protonix) as ordered to reduce gastric acidity. Assist with placement of a wedge under the woman's right hip to displace the gravid uterus and prevent vena cava compression in the supine position. Once the newborn has been removed from the uterus, assist the perinatal team in providing supportive care.

Nursing Management During Labor and Birth

A major focus of care for the woman during labor and birth is maintaining control over her pain, emotions, and actions while being an active participant. Nurses can help and support women to be actively involved in their childbirth experience by allowing time for discussion, offering companionship, listening to worries and concerns, paying attention to the woman's emotional needs, and actively helping and offering information to assist in her understanding of what is happening in each stage of labor.

Nursing Management During the First Stage of Labor

Depending on how far advanced the woman's labor is when she arrives at the facility, the nurse will determine assessment parameters of maternal-fetal status and plan care accordingly. The nurse will provide high-touch, low-tech supportive nursing care during the first stage of labor when admitting the woman and orienting her to the labor and birth suite. Nursing care during this stage will include taking an admission history (reviewing the prenatal record);

checking the results of routine laboratory tests and any special tests such as chorionic villi sampling, amniocentesis, genetic studies, and biophysical profile done during pregnancy; asking the woman about her childbirth preparation (birth plan, classes taken, coping skills); and completing a physical assessment of the woman to establish a baseline of values for future comparison.

Key nursing interventions include:

- Identifying the estimated date of birth from the client and the prenatal chart
- Validating the client's prenatal history to determine fetal risk status
- Determining fundal height to validate dates and fetal growth
- Performing Leopold's maneuvers to determine fetal position, lie, and presentation
- Checking FHR
- Performing a vaginal examination (as appropriate) to evaluate effacement and dilation progress
- Instructing the client and her partner about monitoring techniques and equipment
- Assessing fetal response and FHR to contractions and recovery time
- Interpreting fetal monitoring strips to provide optimal fetal care
- Checking FHR baseline for accelerations, variability, and decelerations
- Repositioning the client to obtain optimal FHR pattern
- Recognizing FHR problems and initiating corrective measures
- Checking amniotic fluid for meconium staining, odor, and amount
- Comforting client throughout testing period and labor
- Supporting client's decisions regarding intervention or avoidance of intervention
- Assessing client's support system and coping status frequently

In addition to these interventions to promote the optimal outcome for the mother and fetus, the nurse must document care accurately and in a timely fashion (Fig. 14-16). Accurate and timely documentation helps to decrease professional liability exposure and minimize the risk of preventable injuries to women and infants during labor and birth (Simpson & Knox, 2003). Guidelines for recording care include documenting:

- All care rendered, to prove that standards were met
- Conversations with all providers, including notification times
- Nursing interventions before and after notifying provider
- Use of the chain of command and response at each level
- All flow sheets and forms, to validate care given
- All education given to client and response to it
- Facts, not personal opinions
- Initial nursing assessment, all encounters, and discharge plan



● Figure 14-16 The nurse documenting care.

- All telephone conversations (Greenwald & Mondor, 2003)

This standard of documentation is needed to prevent litigation, which is prevalent in the childbirth arena.

Assessment

After the admission assessment (see discussion earlier in the chapter) is complete, assessment continues for changes that would indicate that labor is progressing as expected. Assess the woman's knowledge, experience, and expectations of labor. Typically, blood pressure, pulse, and respirations are assessed every hour during the latent phase of labor unless the clinical situation dictates that vital signs be taken more frequently. During the active and transition phases, they are assessed every 30 minutes. The temperature is taken every 4 hours throughout the first stage of labor unless the clinical situation dictates it more frequently (maternal fever).

Vaginal examinations are performed periodically to track labor progress. This assessment information needs to be shared with the woman to reinforce that she is making progress toward the goal of birth. Uterine contractions are monitored for frequency, duration, and intensity every 30 to 60 minutes during the latent phase, every 15 to 30 minutes during the active phase, and every 15 minutes during transition. Note the changes in the character of the contractions as labor progresses, and inform the woman of her progress. Continually determine the woman's level of pain and her ability to cope and use relaxation techniques effectively.

When the fetal membranes rupture, spontaneously or artificially, assess the FHR and check the amniotic fluid for color, odor, and amount. Assess the FHR intermittently or continuously via electronic monitoring. During the latent phase of labor, assess the FHR every 30 to 60 minutes; in the active phase, assess FHR at least every 15 to 30 minutes. Also, be sure to assess the FHR before ambulation, prior to any procedure, and prior to administering analge-

sia or anesthesia to the mother. Table 14-3 summarizes assessments for the first stage of labor.

Nursing Interventions

Nursing interventions during the admission process should include:

- Asking about the client's expectations of the birthing process
- Providing information about labor, birth, pain-management options, and relaxation techniques
- Presenting information about fetal monitoring equipment and the procedures needed
- Monitoring FHR and identifying patterns that need further intervention
- Monitoring the mother's vital signs to obtain a baseline for later comparison
- Reassuring the client that her labor progress will be monitored closely and nursing care will focus on ensuring fetal and maternal well-being throughout

As the woman progresses through the first stage of labor, nursing interventions include:

- Encouraging the woman's partner to participate
- Keeping the woman and her partner up to date on the progress of the labor
- Orienting the woman and her partner to the labor and birth unit and explaining all of the birthing procedures
- Providing clear fluids (e.g., ice chips) as needed or requested
- Maintaining the woman's parenteral fluid intake at the prescribed rate if she has an IV
- Initiating or encouraging comfort measures, such as back rubs, cool cloths to the forehead, frequent position changes, ambulation, showers, slow dancing, leaning over a birth ball, side-lying, or counterpressure on lower back (Teaching Guidelines 14-1)
- Encouraging the partner's involvement with breathing techniques
- Assisting the woman and her partner to focus on breathing techniques
- Informing the woman that the discomfort will be intermittent and of limited duration; urging her to rest between contractions to preserve her strength; and encouraging her to use distracting activities to lessen the focus of uterine contractions
- Changing bed linens and gown as needed
- Keeping perineal area clean and dry
- Supporting the woman's decisions about pain management
- Monitoring maternal vital signs frequently and reporting any abnormal values
- Ensuring that the woman takes deep cleansing breaths before and after each contraction to enhance gas exchange and oxygen to the fetus
- Educating the woman and her partner about the need for rest and helping them plan strategies to conserve strength

Table 14-3 Summary of Assessments during the First Stage of Labor

Assessments*	Latent Phase (0–3 cm)	Active Phase (4–7 cm)	Transition (8–10 cm)
Vital signs (BP, pulse, respirations)	Every 30–60 min	Every 30 min	Every 15–30 min
Temperature	Every 4 hours	Every 4 hours	Every 4 hours
Contractions (frequency, duration, intensity)	Every 30–60 min by palpation or continuously if EFM	Every 15–30 min by palpation or continuously if EFM	Every 15 min by palpation or continuously if EFM
Fetal heart rate	Every hour by Doppler or continuously by EFM	Every 30 min by Doppler or continuously by EFM	Every 15–30 min by Doppler or continuously by EFM
Vaginal exam	Initially on admission to determine phase and as needed based on maternal cues to document labor progression	As needed to monitor labor progression	As needed to monitor labor progression
Behavior/psychosocial	With every client encounter: talkative, excited, anxious	With every client encounter: self-absorbed in labor; intense and quiet now	With every client encounter: discouraged, irritable, feels out of control, declining coping ability

*The frequency of assessments is dictated by the health status of the woman and fetus and can be altered if either one of their conditions changes.

EFM, electronic fetal monitoring.

- Monitoring FHR for baseline, accelerations, variability, and decelerations
- Checking on bladder status and encouraging voiding at least every 2 hours to make room for birth
- Repositioning the woman as needed to obtain optimal heart rate pattern
- Supporting requests from the woman and communicating them to appropriate personnel
- Respecting the woman's sense of privacy by covering her when appropriate
- Offering human presence (being physically present with the woman), not leaving her alone for long periods
- Exercising patience with the natural labor pattern to allow time for change
- Reporting any deviations from normal to the healthcare professional so that interventions can be initiated early to be effective (Simkin, 2002)

See Nursing Care Plan 14-1.

Nursing Management During the Second Stage of Labor

Nursing care during the second stage of labor focuses on supporting the woman and her partner in making active decisions about her care and labor management, imple-

menting strategies to prolong the early passive phase of fetal descent, supporting involuntary bearing-down efforts, providing instruction and assistance, and using maternal positions that can enhance descent and reduce pain (Roberts, 2003). Research suggests that strong pushing during the second stage may be accompanied by a significant decline in fetal pH and may cause maternal muscle and nerve damage if done too early (Hansen et al., 2002). Shortening the phase of active pushing and lengthening the early phase of passive descent can be achieved by encouraging the woman not to push until she has a strong desire to do so and until the descent and rotation of the fetal head are well advanced. Effective pushing can be achieved by assisting the woman to assume a more upright or squatting position (Simkin & Ancheta, 2000).

Perineal lacerations or tears can occur during the second stage when the fetal head emerges through the vaginal introitus. The extent of the laceration is defined by depth: a first-degree laceration extends through the skin; a second-degree laceration extends through the muscles of the perineal body; a third-degree laceration continues through the anal sphincter muscle; and a fourth-degree laceration also involves the anterior rectal wall. Special attention needs to be paid to third- and fourth-degree lacerations to prevent future fecal incontinence (Ladewig, London, &



TEACHING GUIDELINES 14-1

Teaching for Positioning During the First Stage of Labor

Try using some of these positions during the first stage of labor:

- Walking with support from your partner (adds the force of gravity to contractions to promote fetal descent)
- Slow-dancing position with your partner holding you (adds the force of gravity to contractions and promotes support from and active participation of your partner)
- Side-lying with pillows between the knees for comfort (offers a restful position and improves oxygen flow to the uterus)
- Semi-sitting in bed or on a couch leaning against the partner (reduces back pain because fetus falls forward, away from the sacrum)
- Sitting in a chair with one foot on the floor and one on the chair (changes pelvic shape)
- Leaning forward by straddling a chair, a table, or a bed or kneeling over a birth ball (reduces back pain, adds the force of gravity to promote descent; possible pain relief if partner can apply sacral pressure)
- Sitting in a rocking chair or on a birth ball and shifting weight back and forth (provides comfort because rocking motion is soothing; uses the force of gravity to help fetal descent)
- Lunge by rocking weight back and forth with foot up on chair during contraction (uses force of gravity by being upright; enhances rotation of fetus through rocking)
- Open knee–chest position (helps to relieve back discomfort) (Simkin & Ancheta, 2000)

Davidson, 2006). Any lacerations should be repaired by the primary care provider during the third stage of labor.

An episiotomy is an incision made in the perineum to enlarge the vaginal outlet and theoretically to shorten the second stage of labor. Alternative measures such as warm compresses and continual massage with oil have been successful in stretching the perineal area to prevent cutting it. Further research needs to be done to validate the efficacy of natural measures versus the episiotomy. The midline episiotomy is the most common one used in the United States because it can be easily repaired and causes the least amount of pain (Lowdermilk & Perry, 2004). Figure 14-17 shows episiotomy locations.

Assessment

Assessment is continuous during the second stage of labor. Hospital policies dictate the specific type and timing of assessments, as well as the way in which they are documented. Figure 14-18 shows a sample form.

Assessment involves identifying the signs typical of the second stage of labor, including:

- Increase in apprehension or irritability
- Spontaneous rupture of membranes
- Sudden appearance of sweat on upper lip
- Increase in blood-tinged show
- Low grunting sounds from the woman
- Complaints of rectal and perineal pressure
- Beginning of involuntary bearing-down efforts

Other ongoing assessments include the contraction frequency, duration, and intensity; maternal vital signs every 5 to 15 minutes; fetal response to labor as indicated by FHR monitor strips; amniotic fluid for color, odor, and amount when membranes are ruptured; and the woman and her partner's coping status (Table 14-4).

Assessment also focuses on determining the progress of labor. Associated signs include bulging of the perineum, labial separation, advancing and retreating of the newborn's head during and between bearing-down efforts, and **crowning** (fetal head is visible at vaginal opening; Fig. 14-19).

A vaginal examination is completed to determine if it is appropriate for the woman to push. Pushing is appropriate if the cervix has fully dilated to 10 cm and the woman feels the urge to push.

Nursing Interventions

Nursing interventions during this stage focus on motivating the woman, encouraging her to put all her efforts to pushing this newborn to the outside world, and giving her feedback on her progress. If the woman is pushing and not making progress, the nurse can suggest she keep her eyes open during the contractions and look toward where the infant is coming out. Changing positions every 20 to 30 minutes will also help in making progress. Positioning a mirror so the woman can visualize the birthing process and how successful her pushing efforts are can help motivate her.

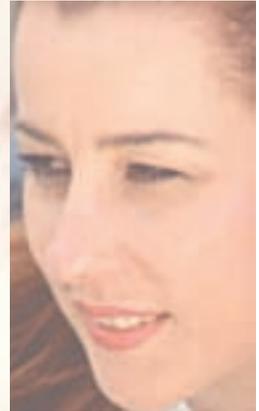
During the second stage of labor, an ideal position would be one that opens the pelvic outlet as wide as possible, provides a smooth pathway for the fetus to descend through the birth canal, uses the advantages of gravity to assist the fetus to descend, and gives the mother a sense of being safe and in control of the labor process (Gupta & Nikodem, 2003). Some suggestions for positions in the second stage include:

- Lithotomy with feet up in stirrups: most convenient position for caregivers
- Semi-sitting with pillows underneath knees, arms, and back
- Lateral/side-lying with curved back and upper leg supported by partner
- Sitting on birthing stool: opens pelvis, enhances the pull of gravity, and helps with pushing
- Squatting/supported squatting: gives the woman a sense of control

Nursing Care Plan 14-1

Overview of the Woman in the Active Phase of the First Stage of Labor

Candice, a 23-year-old gravida 1, para 0 (G1,P0) is admitted to the labor and birth suite at 39 weeks' gestation having contractions of moderate intensity every 5 to 6 minutes. A vaginal exam reveals her cervix is 80% effaced and 5 cm dilated. The presenting part (vertex) is at 0 station and her membranes ruptured spontaneously 4 hours ago at home. She is admitted and an IV is started for hydration and vascular access. An external fetal monitor is applied. FHR is 140 bpm and regular. Her partner is present at her bedside. Candice is now in the *active phase of the first stage of labor*, and her assessment findings are as follows: cervix dilated 7 cm, 80% effaced; moderate to strong contractions occurring regularly, every 3 to 5 minutes, lasting 45 to 60 seconds; at 0 station on pelvic exam; FHR auscultated loudest below umbilicus at 140 bpm; vaginal show—pink or bloody vaginal mucus; currently apprehensive, inwardly focused, with increased dependency; voicing concern about ability to cope with pain; limited ability to follow directions.



Nursing Diagnosis: Anxiety related to labor and birth process and fear of the unknown related to client's first experience

Outcome identification and evaluation

Client will remain calm and in control *as evidenced by ability to make decisions and use positive coping strategies.*

Interventions with rationales

- Provide instruction regarding the labor process to allay anxiety.
- Reorient the woman to the physical environment and equipment as necessary *to keep client informed of events.*
- Encourage verbalization of feelings and concerns *to reduce anxiety.*
- Listen attentively to woman and partner *to demonstrate interest and concern.*
- Inform woman and partner of standard procedures/processes *to ensure adequate understanding of events and procedures.*
- Frequently update/inform woman of progress and labor status *to provide positive reinforcement for actions.*
- Reinforce relaxation techniques and provide instruction if needed *to aid in coping.*
- Encourage participation of the partner in the coaching role; role-model to facilitate partner participation in labor process *to provide support and encouragement to the client.*
- Provide a presence and remain with woman as much as possible *to provide comfort and support.*

Nursing Diagnosis: Pain related to effects of contractions and cervical dilatation and events of labor

Client will maintain a tolerable level of pain and discomfort *as evidenced by statements of pain relief, pain rating of 2 or less on pain rating scale, and absence of adverse effects in client and fetus from analgesia or anesthesia.*

- Monitor vital signs, observe for signs of pain and have client rate pain on a scale of 0 to 10 *to provide baseline for comparison.*
- Encourage client to void every 1 to 2 hours *to decrease pressure from a full bladder.*

(continued)

Overview of the Woman in the Active Phase of the First Stage of Labor (continued)

Outcome identification and evaluation

Interventions with rationales

Assist woman to change positions frequently *to increase comfort and promote labor progress.*

Encourage use of distraction *to reduce focus on contraction pain.*

Suggest pelvic rocking, massage, or counter back pressure *to reduce pain.*

Assist with use of relaxation and breathing techniques *to promote relaxation.*

Use touch appropriately (backrub) when desired by the woman *to promote comfort.*

Integrate use of nonpharmacologic measures of pain relief, such as warm water, birthing ball, or other techniques *to facilitate pain relief.*

Administer pharmacologic agents as ordered when requested *to control pain.*

Provide reassurance and encouragement between contractions *to foster self-esteem and continued participation in labor process.*

Nursing Diagnosis: Risk of infection related to vaginal exams following rupture of membranes

Client will remain free of infection *as evidenced by absence of signs and symptoms of infection, vital signs and FHR within acceptable parameters, lab test results within normal limits, and clear amniotic fluid without odor.*

Monitor vital signs (every 1 to 2 hours after ROM) and FHR frequently as per protocol *to allow for early detection of problems; report fetal tachycardia (early sign of maternal infection) to ensure prompt treatment.*

Provide frequent perineal care and pad changes *to maintain good perineal hygiene.*

Change linens and woman's gown as needed *to maintain cleanliness.*

Ensure that vaginal exams are performed only when needed *to prevent introducing pathogens into the vaginal vault.*

Monitor lab test results such as white blood cell count *to assess for elevations indicating infection.*

Use aseptic technique for all invasive procedures *to prevent infection transmission.*

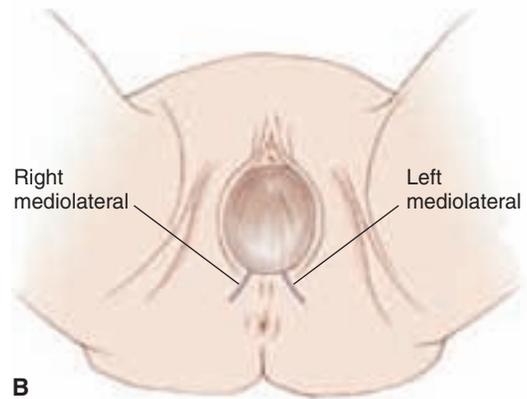
Carry out good handwashing techniques before and after procedures and use standard precautions as appropriate *to minimize risk of infection transmission.*

Document amniotic fluid characteristics—color, odor—*to establish baseline for comparison.*

- Kneeling with hands on bed and knees comfortably apart
 - Other important nursing interventions during the second stage include:
- Providing continuous comfort measures such as mouth care, position changes, changing bed linen and underpads, and providing a quiet, focused environment
- Instructing the woman on the following bearing-down positions and techniques:
 - Pushing only when she feels an urge to push
 - Using abdominal muscles when bearing down
 - Using short pushes of 6 to 7 seconds
 - Focusing attention on the perineal area to visualize the newborn
 - Relaxing and conserving energy between contractions



A



B

● Figure 14-17 Location of an episiotomy. (A) Midline episiotomy. (B) Right and left mediolateral episiotomies.

- Pushing several times with each contraction
- Pushing with an open glottis and slight exhalation (Roberts, 2003)
- Continuing to monitor contraction and FHR patterns to identify problems
- Providing brief, explicit directions throughout this stage
- Continuing to provide psychosocial support by reassuring and coaching
- Facilitating the upright position to encourage the fetus to descend
- Continuing in assessment measurements: blood pressure, pulse, respirations, uterine contractions, bearing-down efforts, FHR, coping status of the client and her partner
- Providing pain management if needed
- Providing a continuous nursing presence
- Offering praise for the client's efforts
- Preparing for and assisting with delivery by:
 - Notifying the health care provider of the estimated timeframe for birth
 - Preparing the delivery bed and positioning client
 - Preparing the perineal area according to the facility's protocol
 - Offering a mirror and adjusting it so the woman can watch the birth
 - Explaining all procedures and equipment to the client and her partner
 - Setting up delivery instruments needed while maintaining sterility
 - Receiving newborn and transporting him or her to a warming environment, or covering the newborn with a warmed blanket on the woman's abdomen
 - Providing initial care and assessment of the newborn (see the Birth section that follows)

Birth

The second stage of labor ends with the birth of the newborn. The maternal position for birth varies from the standard lithotomy position to side-lying to squatting to standing or kneeling, depending on the birthing location, the woman's preference, and standard protocols. Once the woman is positioned for birth, the vulva and perineal area are cleansed. The primary healthcare provider then takes charge after donning protective eyewear, masks, gowns, and gloves and performing hand hygiene.

Once the fetal head has emerged, the primary care provider explores the fetal neck to see if the umbilical cord is wrapped around it. If it is, the cord is slipped over the head to facilitate delivery. As soon as the head emerges, the healthcare provider suctions the newborn's mouth and nares with a bulb syringe to prevent aspiration of mucus, amniotic fluid, or meconium (Fig. 14-20). The umbilical cord is double-clamped and cut between the clamps. With the first cries of the newborn, the second stage of labor ends.

Immediate Care of the Newborn

Once the infant is born, the nurse places the newborn under the radiant warmer, dries the newborn, assesses the newborn, wraps the newborn in warmed blankets, and places the newborn on the woman's abdomen for warmth and closeness. In some healthcare facilities, the newborn is placed on the woman's abdomen immediately after birth and covered with a warmed blanket. In either scenario, the stability of the newborn dictates the location of aftercare. The nurse can also assist with the first breastfeeding.

Assessment of the newborn begins at the moment of birth and continues until the newborn is discharged.

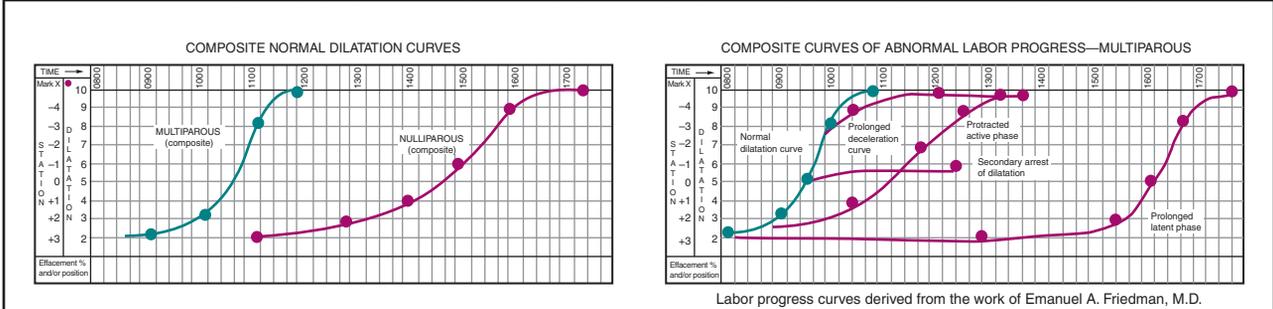
<h2 style="margin: 0;">Labor Progress Chart</h2> <p style="margin: 0;">Maternal/Newborn Record System</p>															
Admit date	Admit time	Blood type and Rh	Age	G	T	Pt	A	L	EDD ___/___/___	LMP ___/___/___	Membranes	<input type="checkbox"/> Intact <input type="checkbox"/> Ruptured SROM AROM <input type="checkbox"/> Bulging Date ___/___/___ Time ___:___			
Current date	Time →														
Vital signs	Temperature														
	Pulse														
	Respiration /O ₂ saturation														
	Blood pressure														
Maternal	Deep tendon reflexes(L/R)	/	/	/	/	/	/	/	/	/	/	/	/	/	
	Urine (protein/sugar)	/	/	/	/	/	/	/	/	/	/	/	/	/	
	Vaginal bleeding														
	Pain														
	Edema (site, extent)														
Uterine activity	Monitor mode														
	Frequency														
	Duration														
	Peak IUP														
	Resting tone														
	Intensity														
Fetal assessment	MVUs														
	Monitor mode (Strip # ___)														
	Baseline (FHR)														
	STV														
	LTV														
	Accelerations														
	Decelerations														
Intake/output (mLs/Hr)	Membranes/fluid														
	Scalp pH														
	IV														
	PO														
Cont meds	Urine														
	Emesis														
Intervention	Pitocin mU/min														
	Magnesium sulfate gms/hr														
Abbreviations/ key	Treatments														
	Teaching/support														
	Touch														
	Position/activity														
	Physical care														
Initials															
Deep tendon reflexes 0 = No response +1 = Sluggish +2 = Normal +3 = Hyperactive +4 = Brisk + hyperactive C = Clonus		Vaginal bleeding NS = Normal show ABN = Frank vaginal bleeding		Pain 0 = No pain 5 = Distressing pain 10 = Highest intensity		Uterine activity monitor mode P = Palpation E = External I = Internal		MVUs Monteideo units The sum of the peak of each uterine contraction minus its resting tone, in a 10-minute period.		Fetal monitor mode A = Auscultation (fetoscope) D = Doppler E = External I = Internal		STV short-term variability + = Present (roughness of tracing line present) ∅ = Absent (tracing line is smooth) LTV long-term variability ∅ = 0- 2 BPM = Absent ↓ = 3- 5 BPM = Minimal + = 6-25 BPM = Absent ↑ = greater than 25 BPM = Marked			

● Figure 14-18 A sample labor flow sheet. (Used with permission. Briggs Corporation, 2001.) (continued)

Labor Progress Chart

Maternal/Newborn Record System

TIME → Mark X ● 10 -4 9 -3 8 -2 7 -1 6 0 5 +1 4 +2 3 +3 2 S T A T I O N D I L A T I O N	
Effacement % and/or position Examined by:	



IV Record

Start date	Time	Site	Solution	Amount (mLs)	Medication/dose added	Initials	Infused date	Time	Amount infused

Interval medications

Date, time	Medication/dose	Route	Site	Initials

Signature key

Initials	Signature

● Figure 14-18 (continued)

Table 14-4 Summary of Assessments During the Second, Third, and Fourth Stages of Labor

Assessments*	Second Stage of Labor (Birth of Neonate)	Third Stage of Labor (Placenta Expulsion)	Fourth Stage of Labor (Recovery)
Vital signs (BP, pulse, respirations)	Every 5–15 min	Every 15 min	Every 15 min
Fetal heart rate	Every 5–15 min by Doppler or continuously by EFM	Apgar scoring at 1 and 5 min	Newborn—complete head-to-toe assessment; vital signs every 15 min until stable
Contractions/uterus	Palpate every one	Observe for placental separation	Palpating for firmness and position every 15 min for first hr
Bearing down/pushing	Assist with every effort Observe for signs of descent—bulging of perineum, crowning	None	None
Vaginal discharge		Assess bleeding after expulsion	Assess every 15 min with fundus firmness
Behavior/psychosocial	Observe every 15 min: cooperative, focus is on work of pushing newborn out	Observe every 15 min: often feelings of relief after hearing newborn crying; calmer	Observe every 15 min: usually excited, talkative, awake; needs to hold newborn, be close, and inspect body

*The frequency of assessments is dictated by the health status of the woman and fetus and can be altered if either one of their conditions changes.
EFM, electronic fetal monitoring.



● Figure 14-19 Crowning.

Drying the newborn and providing warmth to prevent heat loss by evaporation is essential to help support thermoregulation and provide stimulation. Placing the newborn under a radiant heat source and putting on a stockinet cap will further reduce heat loss after drying.

The nurse assesses the newborn by assigning an Apgar score at 1 and 5 minutes. The Apgar score assesses five parameters—heart rate (absent, slow, or fast), respiratory effort (absent, weak cry, or good strong yell), muscle tone (limp, or lively and active), response to irritation stimulus, and color—that evaluate a newborn's cardiorespiratory adaptation after birth. The parameters are arranged from the most important (heart rate) to the least important (color). The newborn is assigned a score of 0 to 2 in each of the five parameters. The purpose of the Apgar assessment is to evaluate the functioning of the central nervous system; see Chapter 18 for additional information on Apgar scoring.

Two identification bands are secured on the newborn's wrist and ankle that match the band on the mother's wrist to ensure the newborn's identity. This identification process is completed in the birthing suite before anyone leaves the room. Some health care agencies also take an



● Figure 14-20 Suctioning the newborn immediately after birth.

early photo of the newborn for identification in the event of abduction (McKinney et al., 2005).

Other types of newborn security systems can also be used to prevent abduction. Some systems have sensors that are attached to the newborn's identification bracelet or cord clamp. An alarm is set off if the bracelet or clamp activates receivers near exits. Others have an alarm that is activated when the sensor is removed from the newborn (Fig. 14-21). Even with the use of electronic sensors, the parents, nursing staff, and security personnel are responsible for prevention strategies and ensuring the safety and protection of all newborns and their families (Shogan, 2002).

Nursing Management During the Third Stage of Labor

During the third stage of labor, strong uterine contractions continue at regular intervals under the continuing influence of oxytocin. The uterine muscle fibers shorten, or retract, with each contraction, leading to a gradual decrease in the size of the uterus, which helps shear the placenta away from its attachment site. The third stage is complete when the placenta is delivered. Nursing care during the third stage of labor primarily focuses on immediate newborn care and assessment and being available to



● Figure 14-21 An example of a security sensor applied to a newborn's arm.

assist with the delivery of the placenta and inspecting it for intactness.

Three hormones play important roles in the third stage. During this stage the woman experiences peak levels of oxytocin and endorphins, while the high adrenaline levels that occurred during the second stage of labor to aid with pushing begin falling. The hormone oxytocin causes uterine contractions and helps the woman to enact instinctive mothering behaviors such as holding the newborn close to her body and cuddling the baby.

Skin-to-skin contact immediately after birth and the newborn's first attempt at breastfeeding further augment maternal oxytocin levels, strengthening the uterine contractions that will help the placenta to separate and the uterus to contract to prevent hemorrhage. Endorphins, the body's natural opiates, produce an altered state of consciousness and aid in blocking out pain. In addition, the drop in adrenaline level from the second stage, which had kept the mother and baby alert at first contact, causes most women to experience feelings of cold and shivering shortly after giving birth.

A crucial role for nurses during this time is to protect the natural hormonal process by ensuring unhurried and uninterrupted contact between mother and newborn after birth, providing warmed blankets to prevent shivering, and allowing skin-to-skin contact and breastfeeding.

Assessment

Assessment during the third stage of labor includes:

- Monitoring placental separation by looking for the following signs:
 - Firmly contracting uterus
 - Change in uterine shape from discoid to globular ovoid
 - Sudden gush of dark blood from vaginal opening
 - Lengthening of umbilical cord protruding from vagina

- Examining placenta and fetal membranes for intactness the second time (the health care provider assesses the placenta for intactness the first time) (Fig. 14-22)
- Assessing for any perineal trauma, such as the following, before allowing the birth attendant to leave:
 - Firm fundus with bright-red blood trickling: laceration
 - Boggy fundus with red blood flowing: uterine atony
 - Boggy fundus with dark blood and clots: retained placenta
- Inspecting the perineum for condition of episiotomy, if performed
- Assessing for perineal lacerations and ensuring repair by birth attendant

Nursing Interventions

Interventions during the third stage of labor include:

- Describing the process of placental separation to the couple
- Instructing the woman to push when signs of separation are apparent
- Administering an oxytocic if ordered and indicated after placental expulsion
- Providing support and information about episiotomy and/or laceration
- Cleaning and assisting client into a comfortable position after birth, making sure to lift both legs out of stirrups (if used) simultaneously to prevent strain
- Repositioning the birthing bed to serve as a recovery bed if applicable
- Assisting with transfer to the recovery area if applicable
- Providing warmth by replacing warmed blankets over the woman
- Applying an ice pack to the perineal area to provide comfort to episiotomy if indicated
- Explaining what assessments will be carried out over the next hour and offering positive reinforcement for actions
- Ascertaining any needs
- Monitoring maternal physical status by assessing:
 - Vaginal bleeding: amount, consistency, and color

- Vital signs: blood pressure, pulse, and respirations taken every 15 minutes
- Uterine fundus, which should be firm, in the midline, and at the level of the umbilicus
- Recording all birthing statistics and securing primary caregiver's signature
- Documenting birthing event in the birth book (official record of the facility that outlines every birth event), detailing any deviations

Nursing Management During the Fourth Stage of Labor

The fourth stage of labor begins after the placenta is expelled and lasts up to 4 hours after birth, during which time recovery takes place. This recovery period may take place in the same room where the woman gave birth, in a separate recovery area, or in her postpartum room. During this stage, the woman's body is beginning to undergo the many physiologic and psychological changes that occur after birth. The focus of nursing management during the fourth stage of labor involves frequent close observation for hemorrhage, provision of comfort measures, and promotion of family attachment.

Assessment

Assessments during the fourth stage center on the woman's vital signs, status of the uterine fundus and perineal area, comfort level, lochia amount, and bladder status. During the first hour after birth, vital signs are taken every 15 minutes, then every 30 minutes for the next hour if needed. The woman's blood pressure should remain stable and within normal range after giving birth. A decrease may indicate uterine hemorrhage; an elevation might suggest preeclampsia.

The pulse usually is typically slower (60 to 70 bpm) than during labor. This may be associated with a decrease in blood volume following placental separation. An elevated pulse rate may be an early sign of blood loss. The blood pressure usually returns to its prepregnancy level



● Figure 14-22 Placenta. (A) Fetal side. (B) Maternal side.

and therefore is not a reliable early indicator of shock. Fever is indicative of dehydration ($<100.4^{\circ}\text{F}$ or 38°C) or infection ($>101^{\circ}\text{F}$), which may involve the genitourinary tract. Respiratory rate is usually between 16 and 24 breaths per minute and regular. Respirations should be unlabored unless there is an underlying preexisting respiratory condition.

Assess fundal height, position, and firmness every 15 minutes during the first hour following birth. The fundus needs to remain firm to prevent excessive postpartum bleeding. The fundus should be firm (feels like the size and consistency of a grapefruit), located in the midline and below the umbilicus. If it is not firm (boggy), gently massage it until it is firm (see Nursing Procedure 22-1 for more information). Once firmness is obtained, stop massage. If the fundus is displaced to the right of the midline, suspect a full bladder as the cause.

The vagina and perineal areas are quite stretched and edematous following a vaginal birth. Assess the perineum, including the episiotomy if present, for possible hematoma formation. Suspect a hematoma if the woman reports excruciating pain or cannot void or if a mass is noted in the perineal area. Also assess for rectal hemorrhoids, which can cause discomfort.

Assess the woman's comfort level frequently to determine the need for analgesia. Ask the woman to rate her pain on a scale of 1 to 10; it should be less than 3. If it is higher, further evaluation is needed to make sure there aren't any deviations contributing to her discomfort.

Assess vaginal discharge (lochia) every 15 minutes for the first hour and every 30 minutes for the next hour. Palpate the fundus at the same time to ascertain its firmness and help to estimate the amount of vaginal discharge. In addition, palpate the bladder for fullness, since many women receiving an epidural block experience limited sensation in the bladder region. Voiding should produce large amounts of urine (diuresis) each time. Palpation of the woman's bladder after each voiding helps to ensure complete emptying. A full bladder will displace the uterus to either side of the midline and potentiate uterine hemorrhage secondary to bogging.

Nursing Interventions

Nursing interventions during the fourth stage might include:

- Providing support and information to the woman regarding episiotomy repair and related pain-relief and self-care measures
- Applying an ice pack to the perineum to promote comfort and reduce swelling
- Assisting with hygiene and perineal care; teaching the woman how to use the perineal bottle after each pad change and voiding; helping the woman into a new gown
- Monitoring for return of sensation and ability to void (if regional anesthesia was used)

- Encouraging the woman to void by ambulating to bathroom, listening to running water, or pouring warm water over the perineal area with the peribottle
- Monitoring vital signs and fundal and lochia status every 15 minutes and documenting them
- Promoting comfort by offering analgesia for afterpains and warm blankets to reduce chilling
- Offering fluids and nourishment if desired
- Encouraging parent–infant attachment by providing privacy for the family
- Being knowledgeable and sensitive to typical cultural practices after birth
- Assisting the mother to nurse, if she chooses, during the recovery period to promote uterine firmness due to the release of oxytocin from the posterior pituitary gland, which stimulates uterine contractions
- Teaching the woman how to assess her fundus for firmness periodically and to massage it if it is boggy
- Describing the lochia flow and normal parameters to observe for postpartum
- Teaching safety techniques to prevent newborn abduction
- Demonstrating the use of the portable sitz bath as a comfort measure for her perineum if she had a laceration or an episiotomy repair
- Explain comfort/hygiene measures and when to use them
- Assisting with ambulation when getting out of bed for the first time
- Providing information about the routine on the mother–baby unit or nursery for her stay
- Observing for signs of early parent–infant attachment: fingertip touch to palm touch to enfolding of the infant (Murray et al., 2002)

KEY CONCEPTS

- A nurse provides physical and emotional support during the labor and birth process to assist a woman to achieve her goals.
- When a woman is admitted to the labor and birth area, the admitting nurse must assess and evaluate the risk status of this pregnancy and initiate appropriate interventions to provide optimal care for this client.
- Completing an admission assessment includes taking a maternal health history; performing physical assessment on the woman and fetus, including her emotional and psychosocial status; and obtaining the necessary laboratory studies.
- The nurse's role in fetal assessment for labor and birth includes determining fetal well-being and interpreting signs and symptoms of possible compromise. Determining the fetal heart rate (FHR) pattern and assessing amniotic fluid characteristics are key.
- FHR can be assessed intermittently or continuously. Although the intermittent method allows the client to move about during labor, the information

obtained intermittently does not provide a complete picture of fetal well-being from moment to moment.

- Assessment parameters of the FHR are classified as baseline rate, baseline variability (long-term and short-term), and periodic changes in the rate (accelerations and decelerations).
- The nurse monitoring the laboring client needs to be knowledgeable about which parameters are reassuring, nonreassuring, and ominous so that appropriate interventions can be instituted.
- For a nonreassuring FHR pattern, the nurse should notify the healthcare provider about the pattern and obtain further orders, making sure to document all interventions and their effects on the FHR pattern.
- In addition to interpreting assessment findings and initiating appropriate interventions for the laboring client, accurate and timely documentation must be carried out continuously.
- Today's women have many safe nonpharmacologic and pharmacologic choices for the management of pain during childbirth. They may be used individually or in combination to complement one another.
- Nursing management for the woman during labor and birth includes comfort measures, emotional support, information and instruction, advocacy, and support for the partner.
- Nursing care during the first stage of labor includes taking an admission history (reviewing the prenatal record), checking the results of routine laboratory work and special tests done during pregnancy, asking the woman about her childbirth preparation (birth plan, classes taken, coping skills), and completing a physical assessment of the woman to establish a baseline of values for future comparison.
- Nursing care during the second stage of labor focuses on supporting the woman and her partner in making decisions about her care and labor management, implementing strategies to prolong the early passive phase of fetal descent, supporting involuntary bearing-down efforts, providing instruction and assistance, and encouraging the use of maternal positions that can enhance descent and reduce the pain.
- Nursing care during the third stage of labor primarily focuses on immediate newborn care and assessment and being available to assist with the delivery of the placenta and inspecting it for intactness.
- The focus of nursing management during the fourth stage of labor involves frequently observing the mother for hemorrhage, providing comfort measures, and promoting family attachment.

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Web Resources

Academy for Guided Imagery, Inc.: www.interactiveimagery.com
 American College of Obstetricians and Gynecologists: www.acog.org
 American Public Health Association: www.apha.org
 Association of Labor Assistants and Childbirth Educators:
www.alace.org
 Association of Women's Health, Obstetric and Neonatal Nurses
 (AWHONN): www.awhonn.org
 Birthworks: www.birthworks.org

BMJ Publication: Evidence-Based Nursing:
www.evidencebasednursing.com
 Child Find: www.childfind.org
 Department of Health and Human Services: www.4women.gov
 Diversity Rx: www.diversityrx.org
 Doulas of North America (DONA): www.dona.org
 Ethnomed: <http://ethnomed.org>
 HypnoBirthing Institute: www.hypnobirthing.com
 International Childbirth Education Association: www.icea.org
 Lamaze International: www.lamaze-childbirth.com
 National Center for Missing and Exploited Children:
www.missingkids.com
 Transcultural Health Links
www.iun.edu/~libemb/trannurs/trannurs.htm

Chapter WORKSHEET

● MULTIPLE CHOICE QUESTIONS

1. When a client in labor is fully dilated, which instruction would be most effective to assist in encouraging effective pushing?
 - a. Hold your breath and push through entire contraction.
 - b. Use chest-breathing with the contraction.
 - c. Pant and blow during each contraction.
 - d. Push for 6 to 7 seconds several times during each contraction.
2. During the fourth stage of labor, the nurse palpates the uterus on the right side and sees a saturated perineal pad. What is the nurse's *first* action?
 - a. Massage the uterus vigorously.
 - b. Have the client void and reassess her.
 - c. Notify the primary care provider.
 - d. Document as a normal finding.
3. When managing a client's pain during labor, nurses should:
 - a. Make sure the agents given don't prolong labor.
 - b. Know that all pain-relief measures are similar.
 - c. Support the client's decisions and requests.
 - d. Not recommend nonpharmacologic methods.
4. When caring for a client during the active phase of labor without continuous electronic fetal monitoring, the nurse would intermittently assess FHR every:
 - a. 15 minutes
 - b. 5 minutes
 - c. 30 minutes
 - d. 60 minutes
5. The nurse notes the presence of transient fetal accelerations on the fetal monitoring strip. Which intervention would be most appropriate?
 - a. Reposition the client on the left side.
 - b. Begin 100% oxygen via face mask.
 - c. Document this reassuring pattern.
 - d. Call the healthcare provider immediately.

● CRITICAL THINKING EXERCISES

1. Carrie, a 20-year-old primigravida at term, comes to the birthing center in active labor (dilation 5 cm and 80% effaced, -1 station) with ruptured membranes. She states she wants an "all-natural" birth without medication. Her partner is with her and appears anxious but supportive. On the admission assessment, Carrie's prenatal history is unremarkable; vital signs are within normal limits; FHR via Doppler ranges between 140 and 144 bpm and is regular.
 - a. Based on your assessment data and the woman's request not to have medication, what nonpharmacologic interventions could the nurse offer her?
 - b. What positions might be suggested to help facilitate fetal descent?
2. Several hours later, Carrie complains of nausea and turns to her partner and angrily tells him to not touch her and to go away.
 - a. What assessment needs to be done to determine what is happening?
 - b. What explanation can you offer Carrie's partner regarding her change in behavior?

● STUDY ACTIVITIES

1. Interview a primigravida at a community maternity clinic in her last trimester of pregnancy about her birth plan for pain management and specific coping skills she will use for labor. Evaluate them in terms of effectiveness according to the literature, and share this information with the woman.
2. On the fetal heart monitor, the nurse notices an elevation of the fetal baseline with the onset of contractions. This elevation would describe _____.
3. Compare and contrast a local birthing center to a community hospital's birthing suite in terms of the pain management techniques and fetal monitoring used.
4. Select a childbirth website for expectant parents and critique the information provided in terms of its educational level and amount of advertising.