

ESSENTIALS of Maternity, Newborn, & Women's Health Nursing - THIRD EDITION

Susan Scott Ricci, ARNP, MSN, MEd

14: Nursing Management During Labor and Birth

Learning Objectives

Upon completion of the chapter, you will be able to:

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

KEY TERMS

accelerations

artifact

baseline fetal heart rate

baseline variability

crowning

deceleration

electronic fetal monitoring (EFM)

episiotomy

Leopold's maneuvers

neuraxial analgesia/anesthesia

periodic baseline changes

Sheila is admitted in active labor (5 cm dilated) to the labor and birth suite at term. This is her second pregnancy and she is prepared to avoid pain medications this time so she can be more involved with the birthing process. She has been using modified-paced breathing with success thus far.

ESSENTIALS of Maternity, Newborn, & Women's Health

Nursing - **THIRD EDITION** Susan Scott Ricci, ARNP, MSN, MEd

WOW: *Words of Wisdom*

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. Nursing management for labor and birth involves assessment, comfort measures, emotional support, information and instruction, advocacy, and support for the partner. Providing the highest quality in maternity care is dependent on nurses valuing the childbirth experience and recognizing it as a life-changing experience for women and their families; giving care that protects, promotes, and supports physiologic childbirth; providing optimal, evidence-based care; and recognizing health disparity and cultural diversity in all women cared for to improve their childbirth experience across time, settings, and disciplines (Davis, 2010).

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 2020* (U.S. Department of Health and Human Services, 2010) addresses maternal health in two objectives: reducing maternal deaths and reducing maternal illness and complications due to pregnancy (complications during hospitalized labor and delivery). In addition, two more objectives address increasing the proportion of pregnant women who receive early and adequate prenatal care. A goal in development seeks to increase the proportion of pregnant women who attend a series of prepared childbirth classes. (See [Chapters 12](#) for more information on these objectives.)

This chapter provides information about nursing management during labor and birth. First, the essentials for in-depth assessment of maternal and fetal status during labor and birth are discussed. This is followed by a thorough description of the major methods of promoting comfort and providing pain management during the labor and birth process. The chapter concludes by putting all the information together with a discussion of the nursing care specific to each stage of labor, including the necessary data to be obtained with the admission assessment, methods to evaluate labor progress during the first stage of labor, and key nursing measures that focus on maternal and fetal assessments and pain relief for all stages of labor.

MATERNAL ASSESSMENT DURING LABOR AND BIRTH

During labor and birth, various techniques are used to assess maternal status. These techniques provide an on-going source of data to determine the woman's response 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. Also review the prenatal record to identify risk factors that may contribute to a decrease in uteroplacental circulation during labor. If there is no vaginal bleeding on admission, a vaginal examination is performed to assess cervical

ESSENTIALS of Maternity, Newborn, & Women's Health

Nursing - THIRD EDITION

Susan Scott Ricci, ARNP, MSN, MEd

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

[M0504VagBirth](#)

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 along with midwives and physicians (American Hospital Association, 2010). Vaginal examinations are also performed by midwives and physicians.

Take Note!

A vaginal examination 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, the percentage of cervical effacement, and the fetal membrane status and to gather information on presentation, position, station, degree of fetal head flexion, and presence of fetal skull swelling or molding ([Fig. 14.1](#)). 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.

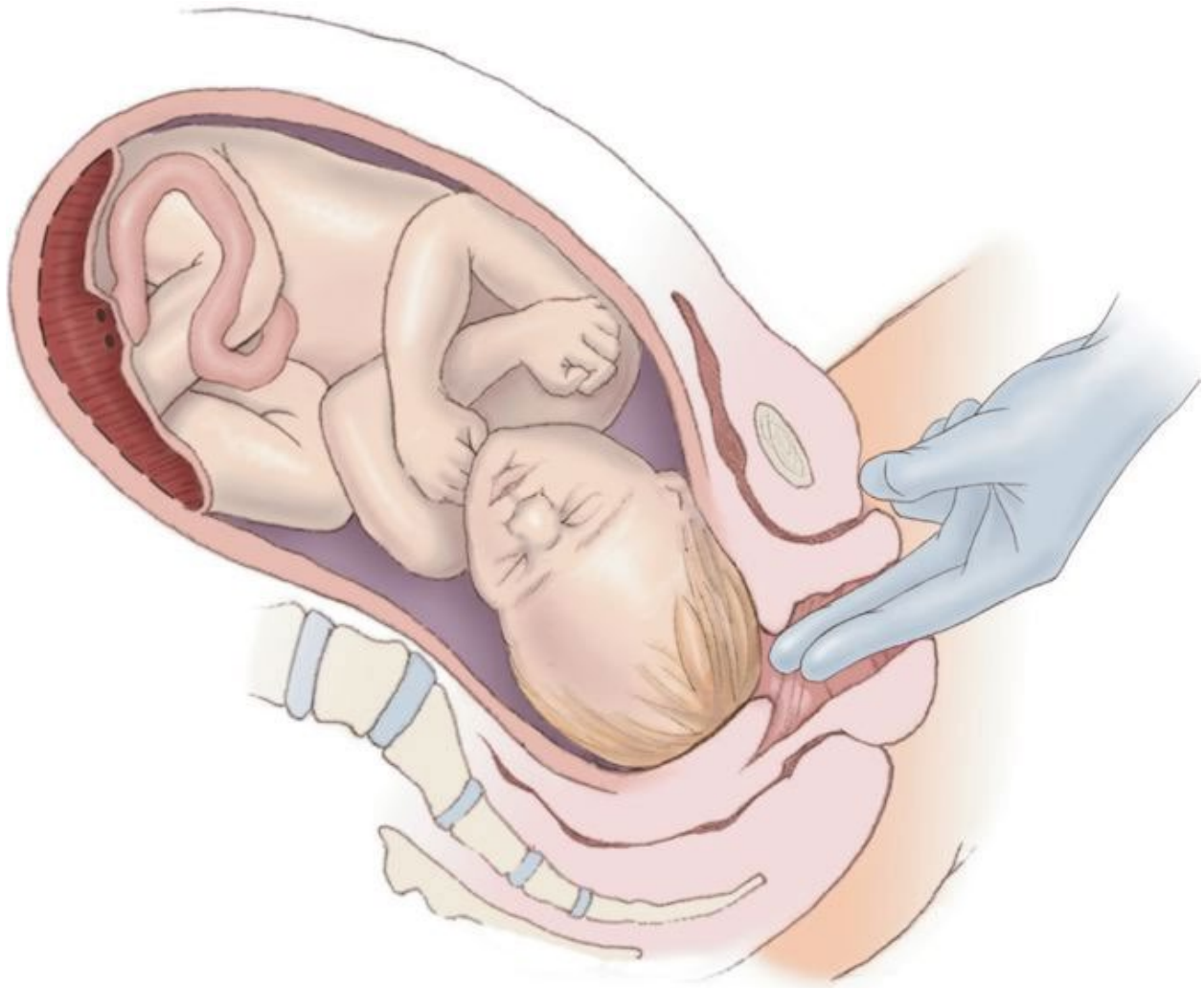


FIGURE 14.1

Vaginal examination to determine cervical dilation and effacement.

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.

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 health care professional in charge of the case.

ESSENTIALS of Maternity, Newborn, & Women's Health

Nursing - THIRD EDITION

Susan Scott Ricci, ARNP, MSN, MEd

Cervical Dilation and Effacement

The amount of cervical dilation (opening) and the degree of cervical effacement (thinning) 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. Effacement and dilation are used to assess cervical changes as follows:

- Effacement:
 - 0%: cervical canal is 2 cm long
 - 50%: cervical canal is 1 cm long
 - 100%: cervical canal is obliterated
- Dilation:
 - 0 cm: external cervical os is closed
 - 5 cm: external cervical os is halfway dilated
 - 10 cm: external os is fully dilated and ready for birth passage

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 midpelvis. 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 (see [Chapter 13](#) for a more detailed discussion).

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. When membranes rupture, the priority focus should be on

ESSENTIALS of Maternity, Newborn, & Women's Health

Nursing - THIRD EDITION

Susan Scott Ricci, ARNP, MSN, MEd

assessing fetal heart rate (FHR) first to identify a deceleration, which might indicate cord compression secondary to cord prolapse. If the membranes are ruptured when the woman comes to the hospital, the health care professional should ascertain when it occurred. Prolonged ruptured membranes increase the risk of infection as a result of ascending vaginal organisms for both mother and fetus. Signs of intrauterine infection to be alert for include maternal fever, fetal and maternal tachycardia, foul odor of vaginal discharge, and an increase in white blood cell count.

To confirm that membranes have ruptured, a sample of fluid is taken from the vagina via a Nitrazine swab to determine the fluid's pH. Vaginal fluid is acidic, whereas amniotic fluid is alkaline and turns a Nitrazine swab blue. Sometimes, however, false-positive results can occur, especially in women experiencing a large amount of bloody show, because blood is alkaline. The membranes are most likely intact if the Nitrazine swab remains yellow to olive green, with pH between 5 and 6. The membranes are probably ruptured if the Nitrazine swab turns a blue-green to deep blue, with pH ranging from 6.5 to 7.5 (Tharpe, Farley, & Jordan, 2013).

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 vaginal 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.

Assessing 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, 2011).

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. 14.2](#)).



FIGURE 14.2

Nurse palpating the woman's fundus during a contraction.

Take Note!

Frequent clinical experience is needed to gain accuracy in assessing the intensity of uterine contractions.

The second method used to assess the intensity of uterine contractions is electronic monitoring, either external or internal. Both methods provide a reasonable measurement of the 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.

ESSENTIALS of Maternity, Newborn, & Women's Health

Nursing - THIRD EDITION

Susan Scott Ricci, ARNP, MSN, MEd

Performing 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?

Leopold's maneuvers are described in [Nursing Procedure 14.1](#).

FETAL ASSESSMENT DURING LABOR AND BIRTH

A fetal assessment identifies well-being or signs that indicate compromise. The character of the amniotic fluid is assessed, but the fetal assessment focuses primarily on determining the FHR pattern. Umbilical cord blood analysis and fetal scalp stimulation are additional assessments performed as necessary in the case of questionable FHR patterns.

Analysis of Amniotic Fluid

NURSING PROCEDURE 14.1: PERFORMING LEOPOLD'S MANEUVERS

Purpose: To Determine Fetal Presentation, Position, and Lie

ESSENTIALS of Maternity, Newborn, & Women's Health Nursing - THIRD EDITION

Susan Scott Ricci, ARNP, MSN, MEd

- 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).



- 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 located (feels hard and smooth).
 - b. Continue to palpate to determine on which side the limbs are located (irregular nodules with kicking and movement).



ESSENTIALS of Maternity, Newborn, & Women's Health

Nursing - **THIRD EDITION**

Susan Scott Ricci, ARNP, MSN, MEd

- 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.



- 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.



Also, note how your hands move. If the hands move together easily, the fetal head

ESSENTIALS of Maternity, Newborn, & Women's Health

Nursing - **THIRD EDITION** Susan Scott Ricci, ARNP, MSN, MEd

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 (Carcio & Secor, 2010).

Amniotic fluid should be clear when the membranes rupture, either spontaneously or artificially by means of an amniotomy, during which a disposable plastic hook (an amnihook) is used to perforate the amniotic sac. Cloudy or foul-smelling amniotic fluid indicates infection. Green fluid may indicate that the fetus has passed meconium secondary to transient hypoxia, prolonged pregnancy, cord compression, intrauterine growth restriction (IUGR), maternal hypertension, diabetes, or chorioamnionitis; however, it is considered a normal occurrence if the fetus is in a breech presentation. If it is determined that meconium-stained amniotic fluid is due to fetal hypoxia, the maternity and pediatric teams work together to prevent meconium aspiration syndrome. This would necessitate suctioning after the head is born before the infant takes a breath and perhaps direct tracheal suctioning after birth if the Apgar score is low. In some cases an amnioinfusion (introduction of warmed, sterile normal saline or Ringer's lactate solution into the uterus) is used to dilute moderate to heavy meconium released in utero to assist in preventing meconium aspiration syndrome.

Analysis of the FHR

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 handheld 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. 14.3](#)). Traditionally, a fetoscope was used to assess fetal heart rate, but the handheld Doppler device has been found to have a greater sensitivity than the fetoscope (Jezewski, Roj, Wrobel, & Horoba, 2011); thus, at present it is exclusively used in most clinical settings.



FIGURE 14.3

Nurse using a handheld Doppler to obtain a fetal heart rate.

Take Note!

Doppler devices are relatively low in cost and are used in hospitals and in home births and birthing centers. Pregnant women can also purchase them to help reduce anxiety between clinical examinations if they had a previous problem during pregnancy (Cheng & Caughey, 2011).

Intermittent FHR monitoring allows the woman to be mobile 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 provide a continuous FHR recording and does not document how the fetus responds to the stress of labor (unless listening is done during the contraction). The best way to assess fetal well-being would be to start listening to the FHR at the end of the contraction (not after one) so that late

ESSENTIALS of Maternity, Newborn, & Women's Health

Nursing - **THIRD EDITION** Susan Scott Ricci, **ARNP, MSN, MEd**

decelerations could be detected. However, 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 (Geidam, Bako, Ibrahim, & Ashir, 2010). 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, a vaginal examination, administration of pain medications, or other clinically important events (Murray, Mahlmeister, Daniels, & Huelsmann, 2011).

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. 14.4](#)). As labor progresses, the FHR location will change accordingly as the fetus descends into the maternal pelvis for the birthing process. To ensure that the maternal heart rate is not confused with the FHR, palpate the client's radial pulse simultaneously while the FHR is being auscultated through the abdomen.

ESSENTIALS of Maternity, Newborn, & Women's Health Nursing - THIRD EDITION

Susan Scott Ricci, ARNP, MSN, MEd

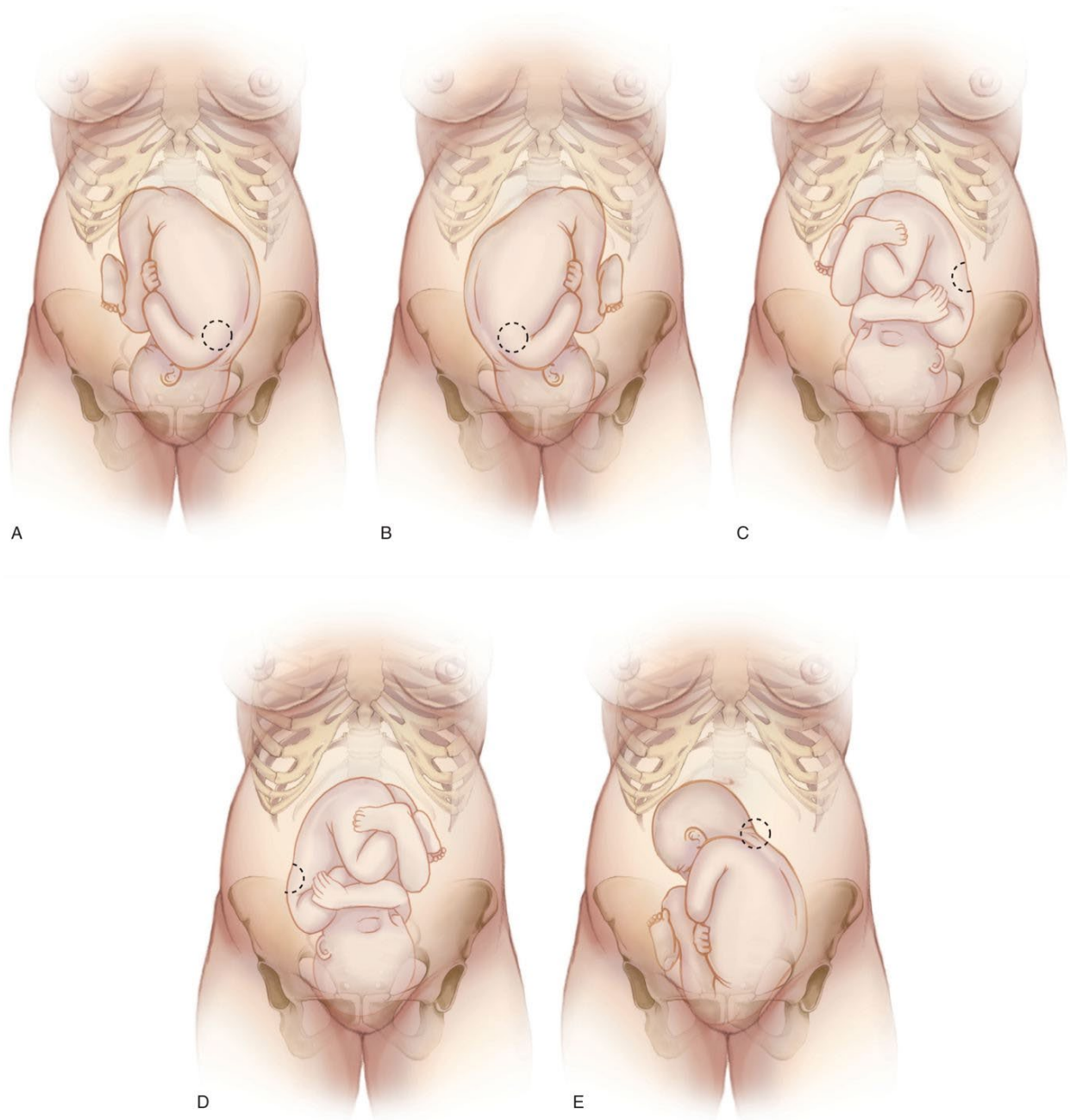


FIGURE 14.4

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).

Nursing Procedure 12.1 in **Chapter 12** lists detailed steps for using a Doppler device to assess FHR. In brief, a small amount of water-soluble gel is applied to the woman's abdomen or ultrasound device before auscultation with the Doppler device to promote sound wave transmission. Usually the FHR is best heard in the woman's lower abdominal

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Nursing - **THIRD EDITION** Susan Scott Ricci, **ARNP, MSN, MEd**

quadrants; if the FHR 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 labor, the information obtained fails to provide a complete picture of the well-being of the fetus from 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 nonassessment 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, 2010a; AWHONN, 2009; ICSI, 2011).

In several randomized controlled studies comparing intermittent auscultation with electronic monitoring in both low- and high-risk clients, no difference in intrapartum fetal death was found. However, in each study a nurse–client ratio of 1:1 was consistently maintained during labor (ICSI, 2011). This suggests that adequate staffing is essential with intermittent FHR monitoring to ensure optimal outcomes for the mother and fetus. There is insufficient evidence to indicate specific situations where continuous electronic FHR monitoring might result in better outcomes when compared to intermittent assessment. However, in pregnancies involving an increased risk of perinatal death, cerebral palsy, or neonatal encephalopathy and when oxytocin is used for induction or augmentation, it is recommended that continuous electronic fetal monitoring be used rather than intermittent fetal auscultation (Society of Obstetricians and Gynecologists of Canada, 2010).

Continuous Electronic Fetal Monitoring

Electronic fetal monitoring (EFM) uses a machine to produce a continuous tracing of the FHR. When the monitoring device is in place, a sound is produced with each heartbeat. In addition, a graphic record of the FHR pattern is produced. The primary objective of EFM is to provide information about fetal oxygenation and prevent fetal injury that could result from impaired fetal oxygenation during labor. The purpose of electronic fetal monitoring is to detect fetal heart rate changes early before they are prolonged and profound. Fetal hypoxia is demonstrated in a heart rate pattern change and is by far the most common

ESSENTIALS of Maternity, Newborn, & Women's Health

Nursing - **THIRD EDITION** Susan Scott Ricci, ARNP, MSN, MEd

etiology of fetal injury and death that can be prevented with early interventions (King & Parer, 2011).

Current methods of continuous EFM were introduced in the United States during the 1970s, specifically for use in clients considered to be at high risk. However, the use of these methods gradually increased and they eventually came to be used for women other than just those at high risk. This increased use has become controversial because it is suspected of being associated with the steadily increasing rates of cesarean births with no decrease in the rate of cerebral palsy (Thompson 2011). Many studies suggest that when compared with standardized intermittent auscultation, the use of intrapartum continuous EFM seems to increase the number of preterm and surgical births but has no significant effect on reducing the incidence of intrapartum death or long-term neurologic injury. When a woman is admitted to the labor unit, a fetal monitor is applied and the fetal heart rate is monitored continuously. An impetus for this is the litigious nature of current society, but the benefits have not been proven scientifically (James, 2011).

With electronic fetal monitoring, there is a continuous record of the FHR: no gaps exist, as they do with intermittent auscultation. The concept of hearing and evaluating every beat of the fetus's heart to allow for early intervention seems logical. On the downside, however, using continuous monitoring can limit maternal movement and encourages the woman to lie in the supine position, which reduces placental perfusion. Despite the criticisms, electronic fetal monitoring remains an accurate method for determining fetal health status by providing a moment-to-moment printout of FHR status.

Various groups within the medical community have criticized the use of continuous fetal monitoring for all pregnant clients, whether high risk or low risk. 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 (Chen, Chauhan, Ananth, et al. 2011). However, its use in low-risk pregnancies continues globally (Afors & Chandrabaran, 2011). This remains an important research issue.

Continuous electronic fetal monitoring can be performed externally (indirectly), with the equipment attached to the maternal abdominal wall, or internally (directly), with the equipment attached to the fetus. Both methods provide a continuous printout of the FHR, but they differ in their specificity. The efficacy of electronic fetal monitoring depends on the accurate interpretation of the tracings, not necessarily which method (external vs. internal) is used.

CONTINUOUS 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 handheld Doppler device. One transducer, called a tocotransducer, which is a pressure-sensitive device that is applied against the uterine fundus, detects changes in uterine pressure and converts the pressure registered into an electronic signal that is recorded on graph paper (Miller, 2011). 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

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Susan Scott Ricci, ARNP, MSN, MEd

the symphysis pubis. The diaphragm of the ultrasound transducer is moved to either side of the abdomen to obtain a stronger sound and is then attached to the second elastic belt. This transducer converts the fetal heart movements into beeping sounds and records them on graph paper ([Fig. 14.5](#)).



FIGURE 14.5

Continuous external electronic fetal monitoring 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, but also can be used with ruptured membranes and a dilating cervix. It is noninvasive 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 (Miller, Miller, & Tucker, 2012).

External monitoring, however, 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. The term **artifact** is used to describe irregular variations or absence of the FHR on the fetal monitor record that result from mechanical limitations of the

ESSENTIALS of Maternity, Newborn, & Women's Health

Nursing - **THIRD EDITION** Susan Scott Ricci, **ARNP, MSN, MEd**

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 to be at high risk. Possible conditions might include multiple gestation, decreased fetal movement, abnormal FHR on auscultation, 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 placed internally within the uterus to record uterine contractions ([Fig. 14.6](#)). The fetal spiral electrode is considered the most accurate method of detecting fetal heart characteristics and patterns because it involves receiving a signal directly from the fetus (Chez & Baird, 2011). Trained labor and birth nurses can place the spiral electrode on the fetal head when the membranes rupture in some health care facilities, but they do not place the intrauterine pressure catheter in the uterus. Internal monitoring does not have to include both an intrauterine pressure catheter and a scalp electrode. A fetal scalp electrode can be used to monitor the fetal heartbeat without monitoring the maternal intrauterine pressure.

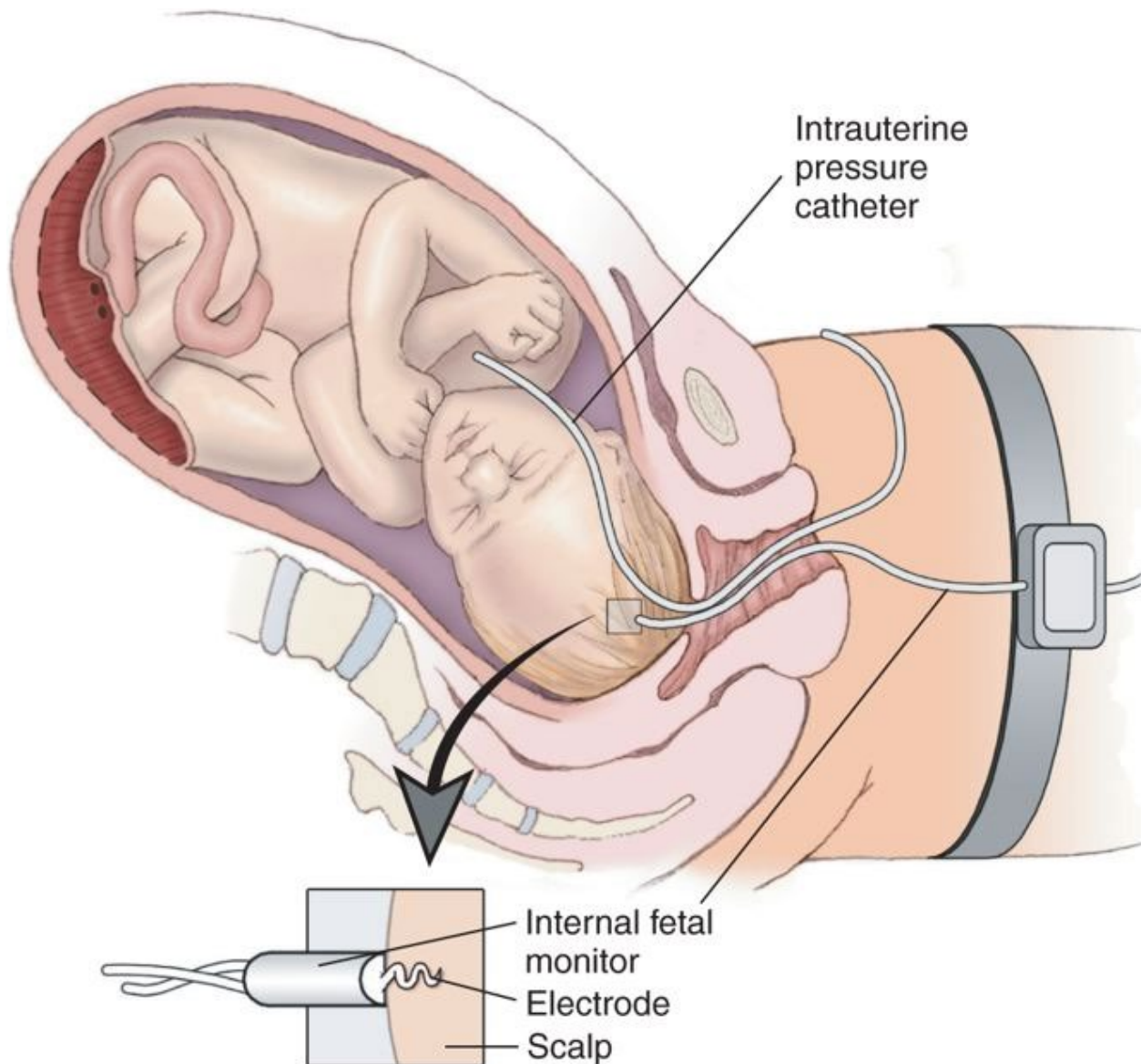


FIGURE 14.6

Continuous internal electronic fetal monitoring.

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.

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 (ICSI, 2011)

ESSENTIALS of Maternity, Newborn, & Women's Health

Nursing - THIRD EDITION

Susan Scott Ricci, ARNP, MSN, MEd

Compared to external monitoring, continuous internal monitoring can accurately detect both short-term (moment-to-moment) changes and variability (fluctuations within the baseline) and FHR dysrhythmias. In addition, maternal position changes and movement do not interfere with the quality of the tracing.

Determining FHR Patterns

Assessment parameters of the FHR include baseline fetal heart rate and variability, presence of accelerations, periodic or episodic decelerations, and changes or trends of fetal heart rate patterns over time. The nurse must be able to interpret the various parameters to determine if the fetal heart rate pattern is a *category I*, which is strongly predictive of normal fetal acid–base status at the time of observation and needs no intervention; a *category II*, which is not predictive of abnormal fetal acid–base status and but does require evaluation and continued monitoring; or a *category III*, which is predictive of abnormal fetal acid–base status at the time of observation and requires prompt evaluation and interventions such as giving maternal oxygen, changing maternal position, discontinuing labor augmentation medication, and/or treating maternal hypotension (Gilbert, 2011). [Table 14.1](#) summarizes these categories.

TABLE 14.1: INTERPRETING FHR PATTERNS

Category I: normal	<i>Predictive of normal fetal acid–base status</i> <ul style="list-style-type: none">• Baseline rate (110–160 bpm)• Baseline variability moderate• Present or absent accelerations• Present or absent early decelerations• No late or variable decelerations
Category II: indeterminate	<i>Not predictive of abnormal fetal acid–base status:</i> <ul style="list-style-type: none">• Fetal tachycardia (>160 bpm) present• Bradycardia (<110 bpm) not accompanied by absent baseline variability• Absent baseline variability not accompanied by recurrent decelerations• Minimal or marked variability• Recurrent late decelerations with moderate baseline variability• Recurrent variable decelerations accompanied by minimal or moderate baseline variability; overshoots, or shoulders• Prolonged decelerations >2 min but <10 min
Category III: abnormal	<i>Predictive of abnormal fetus acid–base status</i> <ul style="list-style-type: none">• Fetal bradycardia (<110 bpm)• Recurrent late decelerations• Recurrent variable decelerations

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Susan Scott Ricci, ARNP, MSN, MEd

-
- Sinusoidal pattern (smooth, undulating baseline)
-

Adapted from Gardner, S. L., Carter, B. S., Enzman-Hines, M., & Hernandez, J. A. (2011). *Merenstein & Gardner's handbook of neonatal intensive care* (7th ed.), St. Louis, MO: Mosby Elsevier; Gilbert, E. S. (2011). *Manual of high risk pregnancy and delivery* (5th ed.). St. Louis, MO: Mosby Elsevier; Mattson, S., & Smith, J. E. (2011). *Core curriculum for maternal–newborn nursing* (4th ed.), St. Louis, MO: Saunders Elsevier; and Miller, L. A., Miller, D. A., & Tucker, S. M. (2012). *Mosby's pocket guide to fetal monitoring: A multidisciplinary approach* (7th ed.), St. Louis, MO: Elsevier Health Sciences.

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 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) (National Institute of Child Health and Human Development [NICHD], 2011). 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 (Mattson & Smith, 2011). 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 analgesic drugs to the mother, hypothermia, anesthetic agents (epidural), maternal hypotension, fetal hypothermia, prolonged umbilical cord compression, and fetal congenital heart block (Gilbert, 2011). Bradycardia may be benign if it is an isolated event, but it is considered an ominous sign when accompanied by a decrease in baseline variability and late decelerations.

Fetal tachycardia is a baseline FHR greater than 160 bpm that lasts for 10 minutes or longer (NICHD, 2011). 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 infection, chronic hypoxemia, congenital anomalies, fetal heart failure, and fetal arrhythmias. Fetal tachycardia is considered an ominous sign if it is accompanied by a decrease in variability and late decelerations (Miller et al., 2011).

BASELINE VARIABILITY

Baseline variability is defined as irregular fluctuations in the baseline fetal heart rate, which is measured as the amplitude of the peak to trough in bpm (Doret et al., 2011). 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 variability 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 (Chez

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Nursing - THIRD EDITION

Susan Scott Ricci, ARNP, MSN, MEd

& Baird, 2011). Thus, variability is one of the most important characteristics of the FHR. Variability is described in four categories as follows:

- *Absent*: fluctuation range undetectable
- *Minimal*: fluctuation range observed at <5 bpm
- *Moderate (normal)*: fluctuation range from 6 to 25 bpm
- *Marked*: fluctuation range >25 bpm

Absent or minimal variability typically is caused by fetal acidemia secondary to uteroplacental insufficiency, cord compression, a preterm fetus, maternal hypotension, uterine hyperstimulation, abruptio placenta, or a fetal dysrhythmia. Interventions to improve uteroplacental blood flow and perfusion through the umbilical cord include lateral positioning of the mother, increasing the IV fluid rate to improve maternal circulation, administering oxygen at 8 to 10 L/min by mask, considering internal fetal monitoring, documenting findings, and reporting to the health care provider. Preparation for a surgical birth may be necessary if no changes occur after attempting the interventions.

Moderate variability indicates that the autonomic and central nervous systems of the fetus are well developed and well oxygenated. It is considered a good sign of fetal well-being and correlates with the absence of significant metabolic acidosis ([Fig. 14.7](#)).

FIGURE 14.7

Long-term variability (average or moderate).

Marked variability occurs when there are more than 25 beats of fluctuation in the FHR baseline. Causes of this include cord prolapse or compression, maternal hypotension, uterine hyperstimulation, and abruptio placenta. Interventions include determining the cause if possible, lateral positioning, increasing IV fluid rate, administering oxygen at 8 to 10 L/min by mask, discontinuing oxytocin infusion, observing for changes in tracing, considering internal fetal monitoring, communicating an abnormal pattern to the health care provider, and preparing for a surgical birth if no change in pattern is noted (Kesselheim et al., 2010).

FHR variability is an important clinical indicator that is predictive of fetal acid–base balance and cerebral tissue perfusion. It is influenced by fetal oxygenation status, cardiac output, and drug effects (Mattson &

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Nursing - THIRD EDITION

Susan Scott Ricci, ARNP, MSN, MEd

Smith, 2011). 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.

Take Note!

External electronic fetal monitoring cannot assess variability accurately. 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.

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 abrupt increases in the FHR above the baseline that last <30 seconds from onset to peak. They are associated with sympathetic nervous stimulation. They are visually apparent, with elevations of FHR of more than 15 bpm above the baseline, and their duration is >15 seconds, but less than 2 minutes (NICHD, 2011). They are generally considered reassuring and require 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 and variable only ([Fig. 14.8](#)).

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Susan Scott Ricci, ARNP, MSN, MEd

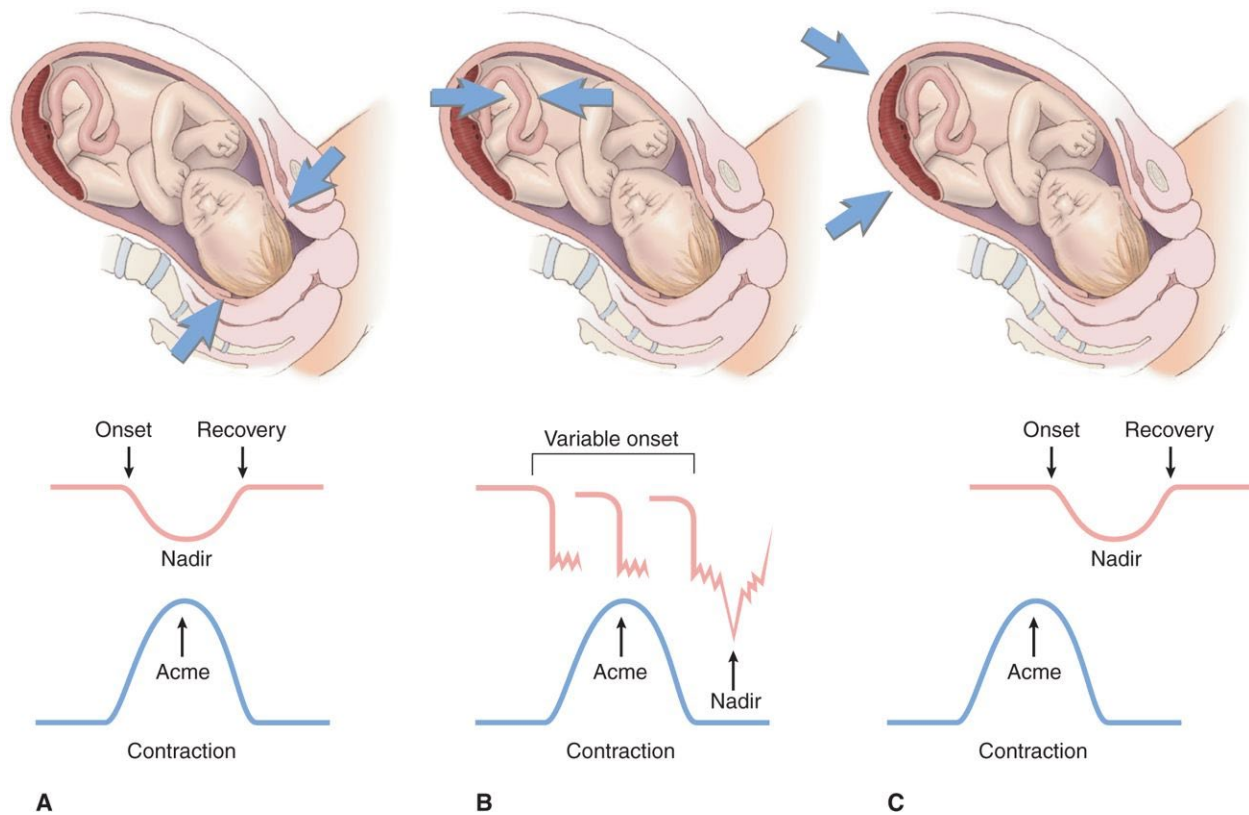


FIGURE 14.8

Decelerations. (A) Early. (B) Variable. (C) Late.

Early decelerations are visually apparent, usually symmetrical, and 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. Typically, the onset, nadir, and recovery of the deceleration occur at the same time as the onset, peak, and recovery of the contraction. 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 visually apparent, usually symmetrical, transitory decreases in FHR that occur after the peak of the contraction. 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 or myocardial depression exists (AWHONN, 2009). 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. Recurrent or intermittent late decelerations are always category II (indeterminate) or category III (abnormal) regardless of depth of

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Susan Scott Ricci, ARNP, MSN, MEd

deceleration. Acute episodes with moderate variability are more likely to be correctable, whereas chronic episodes with loss of variability are less likely to be correctable (Gilbert, 2011). [Box](#)

[14.1](#) highlights interventions for category III decelerations rather than what it says now.

BOX 14.1: INTERVENTIONS FOR CATEGORY III PATTERNS

- Notify the health care 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 or other uterotonic agent as dictated by the facility's protocol, if it is being administered.
- Turn the client on her left or right lateral, kneechest, or hands and knees to increase placental perfusion or relieve cord compression.
- Administer oxygen via nonrebreather face mask to increase fetal oxygenation.
- Increase the IV fluid rate to improve intravascular volume and correct maternal hypotension.
- Assess the client for any underlying contributing causes.
- Provide reassurance that interventions are to effect pattern change.
- Modify pushing in the second stage of labor to improve fetal oxygenation.
- Document any and all interventions and any changes in FHR patterns.
- Prepare for an expeditious surgical birth if the pattern is not corrected in 30 minutes.

Adapted from American College of Obstetricians and Gynecologists [ACOG]. (2010b). Management of intrapartum fetal heart rate tracings. Practice bulletin number 116. *Obstetrics & Gynecology*, 116, 1232–1240; King, T. L., & Parer, J. T. (2011). On electronic fetal heart rate monitoring. *Journal of Obstetric, Gynecologic & Neonatal Nursing*, 40(6), 669–671; and Stout, M., & Cahill, A. (2011). Electronic fetal monitoring: Past, present, and future. *Clinics in Perinatology*, 38(1), 127–142.

Variable decelerations present as visually apparent abrupt decreases in FHR below baseline and 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 (AWHONN, 2009). 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 (Gardner, Carter, Enzman-Hines, & Hernandez, 2011). Variable decelerations are associated with cord compression. However, they are classified either as category II or III depending on the accompanying change in baseline variability (ICSI, 2011). The pattern of variable deceleration consistently related to the contractions with a slow return to FHR baseline warrants further monitoring and evaluation.

Prolonged decelerations are abrupt FHR declines of at least 15 bpm that last longer than 2 minutes, but less than 10 minutes (NICHD, 2011). The rate usually drops to less than 90 bpm. Many factors are associated with this pattern, including prolonged cord compression, abruptio placenta, cord prolapse, supine maternal position, vaginal examination, fetal blood sampling, maternal seizures, regional anesthesia, or uterine rupture (Gilbert, 2011). Prolonged decelerations can be remedied by identifying the underlying cause and correcting it.

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Nursing - THIRD EDITION

Susan Scott Ricci, ARNP, MSN, MEd

A *sinusoidal pattern* is described as having a visually apparent smooth, sinewave-like undulating pattern in the FHR baseline with a cycle frequency of 3 to 5 bpm that persists for >20 minutes. It is attributed to a derangement of central nervous system (CNS) control of FHR and occurs when a severe degree of hypoxia secondary to fetal anemia and hypovolemia is present. It is always considered a category III pattern and to correct it, a fetal intrauterine transfusion would be needed (AWHONN, 2009).

Combinations of FHR patterns obtained by electronic fetal monitoring during labor are not infrequent. Category II and III patterns are more significant if they are mixed, persist for long periods, or have frequent 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 category II and III patterns are associated with decreased baseline variability or abnormal contraction patterns (ICSI, 2011).

Other Fetal Assessment Methods

In situations suggesting the possibility of fetal compromise, such as category II or Category III FHR patterns, further ancillary testing such as umbilical cord blood analysis and fetal scalp stimulation may be used to validate the FHR findings and assist in planning interventions.

Umbilical Cord Blood Analysis

Neonatal and childhood mortality and morbidity, including cerebral palsy, are often attributed to fetal acidosis, as defined by a low cord pH at birth. Umbilical cord blood acid–base analysis drawn at birth provides an objective method of evaluating a newborn's condition, identifying the presence of intrapartum hypoxia and acidemia. This test is considered the most reliable indication of fetal oxygenation and acid–base condition at birth (Mattson & Smith, 2011). The normal mean pH value range is 7.2 to 7.3. The pH values are useful for planning interventions for the newborn born with low 5-minute Apgar scores, severe IUGR, category II and III patterns during labor, umbilical cord prolapse, uterine rupture, maternal fever, placental abruption, meconium-stained amniotic fluid, and post-term births (Malin, Morris, & Khan, 2010). The interventions needed for the compromised newborn might include providing an optimal extrauterine environment, fluids, oxygen, medications, and other treatments.

Fetal Scalp 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 abnormal 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.

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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 placing a gloved finger on the fetal scalp and applying firm pressure. 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 CNS. 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) (Gilbert, 2011). If no acceleratory response by the fetus is exhibited with either scalp stimulation or vibroacoustic stimulation, further evaluation of the fetus is warranted.

PROMOTING COMFORT AND PROVIDING PAIN MANAGEMENT DURING LABOR

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, 2012). A woman's pain perception can be influenced by her previous experiences with pain, fatigue, pain anticipation, genetics, positive or negative support system, labor and birth environment, cultural expectations, and level of emotional stress and anxiety (Landau & Kraft, 2010).

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 (Bowers, 2012). Asian, Latino, and Orthodox Jewish women may request that their own mothers, not their husbands, attend their births; husbands do not actively participate in the birthing process. 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 (Bowers, 2012).

Culturally diverse childbearing families present to the labor and birth suites with the same needs and desires of all families. Give them the same respect and sense of welcome shown to all families. Make sure they have a high-quality birth experience: uphold their religious, ethnic, and cultural values and integrate them into care.

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 about effective nonpharmacologic and pharmacologic measures to relieve pain. Pain management standards issued by the Joint Commission mandate that pain be assessed in all clients admitted to a health care facility (Ismail, Shahzad, & Shafiq 2012). Thus, it is important

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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

Nonpharmacologic measures may include continuous labor support, hydrotherapy, ambulation and position changes, acupuncture and acupressure, attention focusing and imagery, therapeutic touch and massage, 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 (Westbrook & D’Arcy, 2012). 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 labor contractions, they can control how they respond to them, thereby enhancing their feelings of control. See [Evidence-Based Practice 14.1](#) for more information.

EVIDENCE-BASED PRACTICE 14.1: THE EFFECTS OF COMPLEMENTARY AND ALTERNATIVE THERAPIES FOR PAIN MANAGEMENT IN LABOR ON MATERNAL AND PERINATAL MORBIDITY

STUDY

The pain of labor can be intense, with tension, anxiety, and fear making it worse. Many women would like to labor without using drugs and turn to alternatives to manage pain. These alternative methods include acupuncture, mind–body techniques, massage, reflexology, herbal medicines or homoeopathy, hypnosis, and music. This review examined currently available evidence supporting the use of alternative and complementary therapies for pain management in labor. Fourteen trials were included in the review, with data reporting on 1,537 women using different modalities of pain management; 1,448 women were included in the meta-analysis.

Findings

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Acupuncture and hypnosis may help relieve labor pain. There is insufficient evidence about the benefits of music, massage, relaxation, white noise, acupressure, and aromatherapy, and no evidence about the effectiveness of massage or other complementary therapies. In summary, acupuncture and hypnosis may be beneficial for the management of pain during labor; however, the number of women studied has been small. Few other complementary therapies have been subjected to proper scientific study.

Nursing Implications

Although this study did not offer conclusive evidence that alternative therapies for pain management work better than pharmacologic or invasive methods, they should not be discounted. Many women wish to avoid artificial means to control the discomfort of labor. The nurse should be supportive and open-minded about a woman's efforts to meet her pain management goals.

Adapted from Smith, C. A., Collins, C. T., Cyna, A. M., & Crowther, C. A. (2010). Complementary and alternative therapies for pain management in labor. *Cochrane Database of Systematic Reviews* 2010(5). doi: 10.1002/14651858.CD003521.pub2.

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 (Mallory, 2010). A woman's family, a midwife, a nurse, a doula, or anyone else close to the woman can provide this continuous presence. 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 fewer operative deliveries, cesarean births, and requests for pain medication (Kashanian, Javadi, & Haghghi, 2010).

Take Note!

The human presence is of immeasurable value to make the laboring woman feel secure.

Hydrotherapy

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Hydrotherapy is a nonpharmacologic measure that may involve showering or soaking in a regular tub or whirlpool bath. When showering is the selected method of hydrotherapy, the woman stands or sits in a shower chair in a warm shower and allows the water to gently glide over her abdomen and back. If a tub or whirlpool is chosen, the woman immerses herself in warm water for relaxation and relief of discomfort. When the woman enters the warm water, the warmth and buoyancy help to release muscle tension and can impart a sense of well-being (Westbrook & D'Arcy, 2012). Warm water provides soothing stimulation of nerves in the skin, promoting vasodilation, reversal of sympathetic nervous response, and a reduction in catecholamines (Stark, Craig, & Miller, 2011). Contractions are usually less painful in warm water because the warmth and buoyancy of the water have a relaxing effect. Recent research findings reported that women who used hydrotherapy had significantly reduced surgical birth rates, a shorter second stage of labor, reduced analgesic requirements, and a lower incidence of perineal trauma (Stark et al., 2011). The research concluded that hydrotherapy during labor significantly aids the labor process, minimizes the use of analgesic medications, offers fast- and short-acting pain and anxiety relief, and should be considered as a safe and effective birthing aid (Stark et al., 2011).

A wide range of hydrotherapy options are 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 the woman be in active labor (more than 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.

Hydrotherapy is an effective pain management option for many women. Women who are experiencing a healthy pregnancy can be offered this option. The potential risks associated with hydrotherapy including hyperthermia, hypothermia, changes in maternal heart rate, fetal tachycardia, and unplanned underwater birth. The benefits include reducing pain, relieving anxiety, and promoting a sense of control during labor (Stark & Miller, 2010).

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 during the first half of the twentieth century. The medical profession has favored recumbent positions during labor, but without evidence to demonstrate their appropriateness. A recent Cochran database systematic review reported there is evidence that walking and upright positions in the first stage of labor reduce the length of labor and do not seem to be associated with increased intervention or negative effects on mothers' and babies' well-being (Gupta, Hofmeyr & Smyth 2009). Women should be encouraged to take up whatever position they find most comfortable in the first stage of labor (Pridijan, 2011).

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. 14.9](#)).

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Position changes also may help to speed labor by adding the benefits of gravity and changing the shape of the pelvis. Research has found that the position that the woman assumes and the frequency of position changes 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, 2011). Supine 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.



FIGURE 14.9

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Various positions for use during labor. (A) Ambulation. (B) Leaning forward. (C) Sitting in a chair. (D) Using a birthing ball.

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.

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 woman's 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

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Nursing - **THIRD EDITION** Susan Scott Ricci, ARNP, MSN, MEd

	<ul style="list-style-type: none">• Rhythm and music help woman 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
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
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
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 a backrub
On all fours, on 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 examinations

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Nursing - **THIRD EDITION** Susan Scott Ricci, **ARNP, MSN, MEd**

	<ul style="list-style-type: none">• 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• Avoids vena cava syndrome• May offer increased control of pushing efforts• Takes pressure off hemorrhoids• Facilitates relaxation between contractions
Squatting	<ul style="list-style-type: none">• May relieve backache• Takes advantage of gravity• Requires less bearing-down effort• Widens pelvic outlet by approximately 28%• Pressure is evenly distributed to the perineum, reducing the need for episiotomy• 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

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	<ul style="list-style-type: none">• Offers an advantage when pushing, since upper trunk presses on the top of the uterus
Supported squat (leaning back against partner, who supports woman under the arms and takes the entire woman's weight; standing up between contractions)	<ul style="list-style-type: none">• Requires great strength in partner• Lengthens trunk, allowing more room for fetus to maneuver into position• Lets gravity help
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)	<ul style="list-style-type: none">• Has the same advantages of a supported squat• Requires less physical strength from the partner

Adapted from Gilbert, E. S. (2011). *Manual of high risk pregnancy and delivery* (5th ed.). St. Louis, MO: Mosby Elsevier; Lawrence, A., Lewis, L., Hofmeyr, G. J., Dowswell, T., & Styles, C. (2009). Maternal positions and mobility during first stage labor. *Cochrane Database of Systematic Reviews* 2009(2). doi:10.1002/14651858.CD003934.pub2; Mattson, S., & Smith, J. E. (2011). *Core curriculum for maternal–newborn nursing* (4th ed.), St. Louis, MO: Saunders Elsevier; Tharpe, N. L., Farley, C. L., & Jordan, R. (2013). *Clinical practice guidelines for midwifery & women's health* (4th ed.), Sudbury, MA: Jones and Bartlett.

Acupuncture and Acupressure

Acupuncture and acupressure can be used to relieve pain during labor. Although controlled research studies of these methods are limited, there is adequate evidence 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 (Dusek, Finch, Plotnikoff, & Knutson, 2010).

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 (Wiffen, 2010). Stimulating the trigger points causes the release of endorphins, reducing the perception of pain.

Acupressure involves the application of a firm finger or massage used in acupuncture to reduce the pain sensation. The amount of pressure is important. The intensity of the pressure is determined by the

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needs of the woman. Holding and squeezing the hand of a woman in labor may trigger the point most commonly used for both techniques. Some acupressure points are found along the spine, neck, shoulder, toes, and soles of the feet. Pressure along the side of the spine can help relieve back pain during labor (Melchart, Jack, & Kashanian, 2011). A Cochrane collaboration review found that acupuncture may indeed reduce labor pain, increasing satisfaction with pain management and reduced use of pharmacologic management. However, there is a need for further research (Smith, Collins, Crowther, & Levett, 2011).

Application of Heat and Cold

Superficial applications of heat and/or cold, in various forms, are popular with laboring women. They are easy to use, inexpensive, require no prior practice, and have minimal negative side effects when used properly. Heat is typically applied to the woman's back, lower abdomen, groin, and/or perineum. Heat sources include a hot water bottle, heated rice-filled sock, warm compress (washcloth soaked in warm water and wrung out), electric heating pad, warm blanket, and warm bath or shower. In addition to being used for pain relief, heat is used to relieve chills or trembling, decrease joint stiffness, reduce muscle spasm, and increase connective tissue extensibility (Mattson & Smith, 2011).

Cold therapy, or cryotherapy, is usually applied on the woman's back, chest, and/or face during labor. Forms of cold include a bag or surgical glove filled with ice, a frozen gel pack, camper's "ice," a hollow,

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Nursing - **THIRD EDITION** Susan Scott Ricci, ARNP, MSN, MEd

plastic rolling pin or bottle filled with ice, a washcloth



dipped

FIGURE 14.10

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Nursing - THIRD EDITION

Susan Scott Ricci, ARNP, MSN, MEd

Nurse massaging the client's back during a contraction while she ambulates during labor.

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. External fetal monitor belts may interfere with the ability to accomplish this.

Breathing Techniques

Conscious use of breath by the woman has the power to profoundly influence her labor and how she engages with it. The first action we take in any situation is a breath. The breath affects the lungs, immediately cueing the nervous system. The nervous system responds by sending messages, which impact our entire psychophysiologic system. Messages sent from the nervous system affect us physically, emotionally, and mentally. If we alter how we breathe, we alter the constellation of messages and reactions in our entire mind–body experience (Cheng & Caughey, 2011).

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 is not likely to fully focus on contraction pain. Breathing techniques are often taught in childbirth education classes (see [Chapter 12](#) for additional information).

Controlled breathing helps reduce the pain experienced by using 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. Benefits of practicing patterned breathing include:

- Breathing becomes an automatic response to pain.
- Breathing increases relaxation and can be used to deal with life's everyday stresses.
- The steady rhythm of breathing is calming during labor.
- Breathing provides a sense of well-being and a measure of control.
- Breathing brings purpose to each contraction, making them more productive.
- Breathing provides more oxygen for the mother and fetus (American Pregnancy Association, 2011).

Many couples learn patterned-paced breathing during their childbirth education classes. Three levels may be taught, each beginning and ending with a cleansing breath. In the first pattern, also known as slow-paced breathing, the woman inhales slowly through her nose and exhales through pursed lips. The breathing rate is typically 6 to 9 bpm. In the second pattern, also called shallow or modified-paced breathing, the woman inhales and exhales through her mouth at a rate of four breaths every 5 seconds. The rate can be accelerated to two breaths per second to assist her to relax. The third pattern, patterned-paced breathing, is similar to modified-paced breathing except that the breathing is punctuated every few breaths by a forceful exhalation through pursed lips. All breaths are kept equal and rhythmic and can increase as contractions increase in intensity (Mattson & Smith, 2011).

Many childbirth educators do not recommend specific breathing techniques or try to teach parents to breathe the “right” way during labor and birth. Couples are encouraged to find breathing styles that

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Nursing - THIRD EDITION

Susan Scott Ricci, ARNP, MSN, MEd

enhance their relaxation and use them. There are numerous benefits to controlled and rhythmic breathing in childbirth (outlined above), and many women choose these techniques to manage their discomfort during labor.

Pharmacologic Measures

With varying degrees of success, generations of women have sought ways to relieve the pain of childbirth. Pharmacologic 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 newer neuraxial analgesia/anesthesia techniques involving minimal motor blockade have become more popular. **Neuraxial analgesia/anesthesia** is the administration of analgesic (opioids) or anesthetic (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. Low-dose and ultra-low-dose epidural analgesia, spinal analgesia, and combined spinal–epidural analgesia have replaced the traditional epidural for labor. Neuraxial analgesia does not interfere with the progress or outcome of labor. There is no need to withhold neuraxial analgesia until the active stage of labor (Halpern & Abdallah, 2010). This shift in pain management techniques allows a woman to be an active participant in labor.

Take Note!

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; they become distributed throughout the body via the circulatory system. Depending on which administration method 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 CNS 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:

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Nursing - **THIRD EDITION** Susan Scott Ricci, ARNP, MSN, MEd

- Opioids, such as butorphanol (Stadol), nalbuphine (Nubain), meperidine (Demerol), morphine, or fentanyl (Sublimaze)
 - Ataractics, such as hydroxyzine (Vistaril), promethazine (Phenergan), or prochlorperazine (Compazine)
 - Benzodiazepines, such as diazepam (Valium) or midazolam (Versed)
- [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; therefore, it is important for the woman to receive the least amount of systemic medication that relieves her discomfort so that it does not cause any harm to the fetus (Cheng & Caughey, 2011). 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). 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.

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. All opioids are lipophilic and cross the placental barrier, but do not affect labor progress in the active phase. Opioids are associated with newborn respiratory depression, decreased alertness, inhibited sucking, and a delay in effective feeding (King & Brucker, 2011).

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, 2012).

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 (Cheng & Caughey, 2011).

A recent Cochrane review reported that parenteral opioids provide some relief from pain in labor, but are associated with adverse effects. Maternal satisfaction with opioid analgesia appeared moderate at best (Ullman, Smith, Burns, Mori, & Dowswell, 2011).

ESSENTIALS of Maternity, Newborn, & Women's Health

Nursing - **THIRD EDITION** Susan Scott Ricci, ARNP, MSN, MEd

DRUG GUIDE 14.1: COMMON AGENTS USED FOR SYSTEMIC ANALGESIA

Type	Drug	Comments
Opioids	Morphine 2–5 mg IV	May be given IV or epidurally Rapidly crosses the placenta, causes a decrease in FHR variability Can cause maternal and neonatal CNS depression Decreases uterine contractions
	Meperidine (Demerol) 25–75 mg IV	May be given IV, intrathecally, or epidurally with maximal fetal uptake 2–3 hr after administration Can cause CNS depression Decreases fetal variability
	Butorphanol (Stadol) 1–2 mg IV	Is given IV
	Q 2–4 hr	Is rapidly transferred across the placenta Causes neonatal respiratory depression
	Nalbuphine (Nubain) 10–20 mg IV	Is given IV Causes less maternal nausea and vomiting Causes decreased FHR variability, fetal bradycardia, and respiratory depression
	Fentanyl (Sublimaze) 50–100 mcg IV	Is given IV or epidurally Can cause maternal hypotension, maternal and fetal respiratory depression Rapidly crosses placenta

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Nursing - THIRD EDITION Susan Scott Ricci, ARNP, MSN, MEd

Type	Drug	Comments
Antiemetics	Hydroxyzine (Vistaril) 50–100 mg IM	Does not relieve pain but reduces anxiety and potentiates opioid analgesic effects; can not be given IV Is used to decrease nausea and vomiting
	Promethazine (Phenergan) 25–50 mg IV or IM	Is used for antiemetic effect when combined with opioids Causes sedation and reduces apprehension May contribute to maternal hypotension and neonatal depression
	Prochlorperazine (Compazine) 5–10 mg IV or IM	Frequently given with morphine sulfate for sleep during prolonged latent phase; counteracts the nausea that opioids can produce
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

Adapted from Cheng, Y., & Caughey, A. B. (2011). Normal labor and delivery. *eMedicine*. Retrieved from <http://emedicine.medscape.com/article/260036-overview#aw2aab6b2>; King, T. L., & Brucker, M. C. (2011). *Pharmacology for women's health*. Sudbury, MA: Jones & Bartlett; and Skidmore-Roth, L. (2012). *Mosby's 2012 nursing drug reference* (25th ed.). St. Louis, MO: Mosby Elsevier.

Opioid antagonists such as naloxone (Narcan) are given to reverse the effects of the CNS 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,

ESSENTIALS of Maternity, Newborn, & Women's Health

Nursing - **THIRD EDITION** Susan Scott Ricci, ARNP, MSN, MED

nausea, and vomiting, without significantly decreasing analgesia (Skidmore-Roth, 2012). Consult a current drug guide for more specifics on these drug categories.

Antiemetics

The antiemetic group of medications is used in combination with an opioid to decrease nausea and vomiting and lessen anxiety. These adjunct drugs 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 (Skidmore-Roth, 2012). Prochlorperazine (Compazine) is typically given IV or IM with morphine sulfate for sleep during a prolonged latent phase. It counteracts the nausea associated with opioids (King & Brucker, 2011).

Benzodiazepines

Benzodiazepines are used for minor tranquilizing and sedative effects. Diazepam (Valium) also is given IV to stop seizures resulting from eclampsia. 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 (Skidmore-Roth, 2012). 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 CNS depression for both the woman and the newborn.

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 (Mattson & Smith, 2011).

The routes for regional pain relief include epidural block, combined spinal–epidural, local infiltration, pudendal block, and intrathecal (spinal) analgesia/anesthesia. Local and pudendal routes are used during birth for episiotomies (surgical incision into the perineum to facilitate birth); 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 Analgesia

ESSENTIALS of Maternity, Newborn, & Women's Health

Nursing - THIRD EDITION Susan Scott Ricci, ARNP, MSN, MED

Epidural analgesia for labor and birth involves the injection of a local anesthetic agent (e.g., lidocaine or bupivacaine) and an opioid analgesic agent (e.g., morphine or fentanyl) into the lumbar epidural space. A small catheter is then passed through the epidural needle to provide continuous access to the epidural space for maintenance of analgesia throughout labor and birth (Fig. 14.11). Epidural analgesia does increase the duration of the second stage of labor and may increase the rate of instrument-assisted vaginal deliveries as well as that of oxytocin administration (Hawkins, 2010). Approximately 60% of laboring women in the United States receive an epidural for pain relief during labor. In urban areas, many hospitals approach 90% use of epidurals (Gilbert, 2011).



A
FIGURE 14.11

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. Dura mater

When the epidural is properly performed, the woman remains in an awakened and almost pain-free state throughout the entire process of labor and birth (Wright & Cabrera, 2011).

An epidural 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. An epidural 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.

Theoretically, epidural local anesthetics could block all labor pain if used in large volumes and high 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.

ESSENTIALS of Maternity, Newborn, & Women's Health

Nursing - **THIRD EDITION** Susan Scott Ricci, ARNP, MSN, MEd

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 anticoagulation therapy.

Complications include nausea and vomiting, hypotension, fever, pruritus, intravascular injection, maternal fever, allergic reaction, and respiratory depression. Effects on the fetus during labor include fetal distress secondary to maternal hypotension (Gilbert, 2011). Ensuring that the woman avoids a supine position after an epidural catheter has been placed will help to minimize hypotension.

The addition of opioids, such as fentanyl or morphine, to the local anesthetic helps decrease the amount of motor block obtained. Continuous infusion pumps can be used to administer the epidural analgesia, allowing the woman to be in control and administer a bolus dose on demand (Halpern & Abdallah, 2010).

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 (Okutomi, 2010). When compared with traditional epidural or spinal analgesia, which often keeps the woman lying in bed, CSE allows her to ambulate ("walking epidural") (Loubert, Hinova, & Fernando, 2011). 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.

Consider This

When I was expecting my first child, I was determined to put my best foot forward and do everything right. I was an experienced OB nurse, and in my mind doing everything right was expected behavior. I was already 2 weeks past my calculated due date and I was becoming increasingly worried. That particular day I went to work with a backache but felt no contractions.

ESSENTIALS of Maternity, Newborn, & Women's Health

Nursing - THIRD EDITION Susan Scott Ricci, ARNP, MSN, MEd

I managed to finish my shift but felt completely 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; the means it takes to achieve it is less important. 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”?

Although women can walk with CSE, they often choose not to because of sedation and fatigue. Often health care providers do not encourage or assist women to ambulate for fear of injury. Nurses need to evaluate for ambulation safety that includes no postural hypotension and normal leg strength by demonstrating a partial knee bend while standing; they also need to assist with ambulation at all times (Gilbert, 2011). Currently, anesthesiologists are performing walking epidurals using continuous infusion techniques as well as CSE and client-controlled epidural analgesia (Guenther, 2010).

Complications include maternal hypotension, intravascular injection, accidental intrathecal blockade, postdural puncture headache, inadequate or failed block, maternal fever, and pruritus. Hypotension and associated FHR changes are managed with maternal positioning (semi-Fowler's position), intravenous hydration, and supplemental oxygen (Wang, Chang, Liu, Hu, & Tang, 2010).

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 traditional epidural analgesia, PCEA provides equivalent analgesia with lower anesthetic use, lower rates of supplementation, and higher client satisfaction (Haydon et al., 2011).

With PCEA, the woman uses a handheld device connected to an analgesic agent that is attached to an epidural catheter. 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.

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Susan Scott Ricci, ARNP, MSN, MEd

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 or before 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.

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. 14.12](#)).

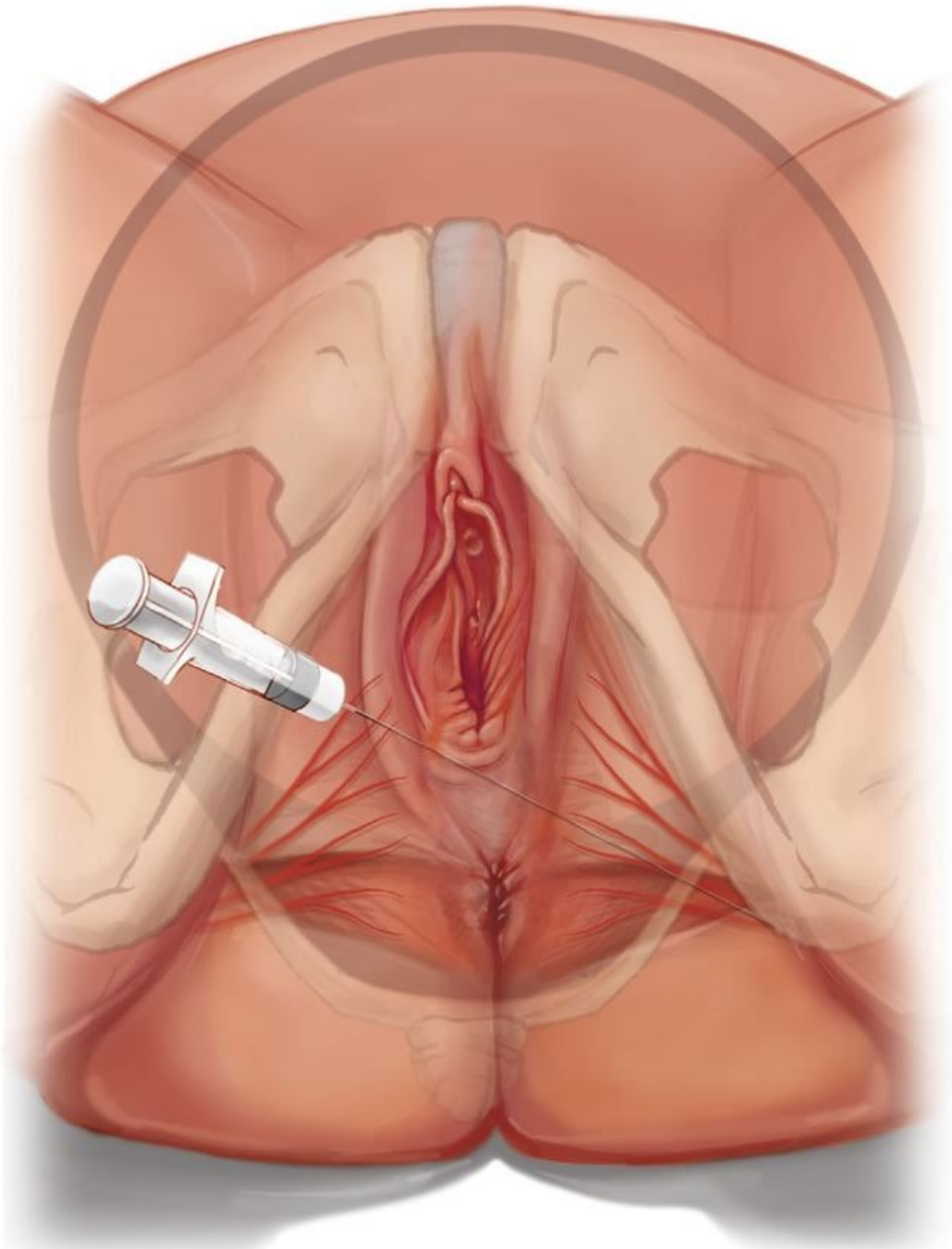


FIGURE 14.12

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Pudendal nerve block.

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 subarachnoid space is a fluid-filled area located between the dura mater and the spinal cord. Spinal anesthesia is frequently used for elective and emergent cesarean births. The contraindications are similar to those for an 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 (Yeomans, 2010). An intrathecal narcotic is given during the active phase (more than 5 cm of dilation) of labor. Compared with epidural blocks, intrathecal narcotics are easy to administer, require a smaller volume of medication, produce excellent muscular relaxation, provide rapid-onset pain relief, are less likely to cause newborn respiratory depression, and do not cause motor blockade (Hawkins, 2010). 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.

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 (Cheng & Caughey, 2011).

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,

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Susan Scott Ricci, ARNP, MSN, MEd

administer a nonparticulate (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 CARE DURING LABOR AND BIRTH

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 universal 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 her newborn. Nurses begin evaluating the mother and fetus during the admission procedures at the health care agency and continue to do so 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 members of her support system (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.

A major focus of care for the woman during labor and birth is assisting her with 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 offering information to help her understand what is happening in each stage of labor.

Nursing Care 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. The nurse is usually the primary gatekeeper of observations, interventions, treatments, and often the management of labor in the inpatient perinatal setting. 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

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Susan Scott Ricci, ARNP, MSN, MEd

woman about her childbirth preparation (birth plan, classes taken, coping skills); and completing a physical assessment of the woman to establish baseline 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
- Checking FHR baseline for accelerations, variability, and decelerations
- Repositioning the client to obtain an 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
- Documenting times of notification for team members if problems arise
- Knowing appropriate interventions when abnormal FHR patterns present
- Supporting the client's decisions regarding intervention or avoidance of intervention
- Assessing the client's support system and coping status frequently

In addition to these interventions to promote optimal outcomes for the mother and fetus, the nurse must document care accurately and in a timely fashion. Accurate and timely documentation helps to decrease professional liability exposure, minimize the risk of preventable injuries to women and infants during labor and birth, and preserve families (Lyndon & Kennedy, 2010). 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
- detailed descriptions of any adverse outcome
- Initial nursing assessment, all encounters, and discharge plan
- All telephone conversations (Hemman, 2011)

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

Assessing the Woman Upon Admission

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Nursing - THIRD EDITION

Susan Scott Ricci, ARNP, MSN, MEd

The nurse usually first comes in contact with the woman either by phone or in person. The nurse should ascertain whether the woman is in true or false labor and whether she should be admitted or sent home. Upon admission to the labor and birth suite, the highest priorities include assessing FHR, assessing cervical dilation/effacement, and determining whether membranes have ruptured or are intact. These assessment data will guide the critical thinking in planning care for the client.

If the initial contact is by phone, establish a therapeutic relationship with the woman. Speaking in a calm caring tone facilitates this. Nurses providing a telephone triage service need to have sufficient clinical experience and have clear lines of responsibility to enable sound decision making. 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, massage, 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 foundation of care, and (2) whenever a clinical choice is presented, choose client safety (Ashcroft, 2010). With these two tenets in mind, advise the woman on the phone to contact her health care 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:

- Consulting the woman's prenatal record for parity status, estimated date of birth, and untoward events
- Calling the health care provider to inform him or her of the woman's status
- Preparing for admission to the perinatal unit to ensure adequate staff assignment
- Notifying 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

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Nursing - **THIRD EDITION** Susan Scott Ricci, **ARNP, MSN, MEd**

women. Therefore, demonstrate respect when addressing the client; listen carefully and express interest and concern. Nurses must value and respect women and promote their self-worth and sense of control by allowing them to participate in making decisions. Allowing them a fair amount of autonomy in their childbirth decisions, supporting their personal worth, knowing them holistically, and using caring communication will increase client satisfaction (Records & Wilson, 2011).

An admission assessment includes maternal health history, physical assessment, fetal assessment, laboratory studies, and assessment of psychological status. Usually the facility has a form that can be used throughout labor and birth to document assessment findings ([Fig. 14.13](#)).

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Nursing - THIRD EDITION Susan Scott Ricci, ARNP, MSN, MED

ADMISSION ASSESSMENT OBSTETRICS					▲ PATIENT IDENTIFICATION ▲				
ADMISSION DATA					NEUROLOGICAL				
Date _____		Time _____		Via _____	<input type="checkbox"/> WNL Variance: <input type="checkbox"/> HA <input type="checkbox"/> Scotoma / visual changes Reflexes <input type="checkbox"/> < 2+ <input type="checkbox"/> > 2+ <input type="checkbox"/> Clonus _____ bts <input type="checkbox"/> Numbness <input type="checkbox"/> Tingling <input type="checkbox"/> Hx Seizures _____ <input type="checkbox"/> _____				
				<input type="checkbox"/> Ambulatory <input type="checkbox"/> Wheelchair <input type="checkbox"/> Stretcher Grav. _____ Term _____ Pre-term _____ Ab. _____ Living _____ EDC _____ LMP _____ GA _____					
Pre. adm. date _____ Reason _____ Obstetrician _____ Pediatrician _____ Ht. _____ Wt. _____ Wt. gain _____ Allergies (meds/food) <input type="checkbox"/> None _____ <input type="checkbox"/> Hx latex sensitivity _____					CARDIOVASCULAR				
BP _____ T _____ P _____ R _____		FHR _____ Vag exam _____			<input type="checkbox"/> WNL Variance: <input type="checkbox"/> Hx Asthma <input type="checkbox"/> URI Respirations: <input type="checkbox"/> < 12 <input type="checkbox"/> > 24 Effort: <input type="checkbox"/> SOB <input type="checkbox"/> Shallow <input type="checkbox"/> Labored Auscultation: <input type="checkbox"/> Diminished <input type="checkbox"/> Crackles <input type="checkbox"/> Wheezes <input type="checkbox"/> Rhonchi <input type="checkbox"/> No <input type="checkbox"/> Yes Cough for greater than 2 weeks? <input type="checkbox"/> <input type="checkbox"/> Is the cough productive? <input type="checkbox"/> <input type="checkbox"/> Blood in the sputum? <input type="checkbox"/> <input type="checkbox"/> Experiencing any fever or night sweats? <input type="checkbox"/> <input type="checkbox"/> Ever had TB in the past? <input type="checkbox"/> <input type="checkbox"/> Recent exposure to TB? <input type="checkbox"/> <input type="checkbox"/> Weight loss in last 3 weeks? <input type="checkbox"/> <input type="checkbox"/> <i>If the patient answers yes to any three of the above questions implement policy and procedure # 5725-0704.</i>				
Reason for Admission <input type="checkbox"/> Labor / SROM <input type="checkbox"/> Induction _____ <input type="checkbox"/> Primary C/S _____ <input type="checkbox"/> Repeat C/S _____ <input type="checkbox"/> Observation _____ <input type="checkbox"/> OB / Medical complication _____									
Onset of labor: <input type="checkbox"/> Not in labor Date _____ Time _____ Membranes: <input type="checkbox"/> Intact <input type="checkbox"/> Ruptured / Date _____ Time _____ <input type="checkbox"/> Clear <input type="checkbox"/> Meconium <input type="checkbox"/> Bloody <input type="checkbox"/> Foul Vaginal bleeding: <input type="checkbox"/> None <input type="checkbox"/> Normal show <input type="checkbox"/> _____					<input type="checkbox"/> WNL Variance: _____ <input type="checkbox"/> Numbness <input type="checkbox"/> Tingling <input type="checkbox"/> Paralysis <input type="checkbox"/> Deformity <input type="checkbox"/> Scoliosis _____				
Current Pregnancy Labs <input type="checkbox"/> NPC <input type="checkbox"/> POL <input type="checkbox"/> PPROM <input type="checkbox"/> Cerclage <input type="checkbox"/> PIH <input type="checkbox"/> Chr. HTN <input type="checkbox"/> Other _____ <input type="checkbox"/> Diabetes _____ Diet _____ <input type="checkbox"/> Insulin _____ <input type="checkbox"/> Amniocentesis _____ Results _____ Bld type / RH _____ Date Rhogam _____ Antibody screen <input type="checkbox"/> Neg <input type="checkbox"/> Pos Rubella <input type="checkbox"/> Non-immune <input type="checkbox"/> Immune Diabetic screen <input type="checkbox"/> Normal <input type="checkbox"/> Abnormal Recent exposure to chick pox <input type="checkbox"/> Current meds: _____ Hepatitis B <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> No HIV <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> No Group B strep <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> No GC <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> No 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 <input type="checkbox"/> POL <input type="checkbox"/> Multiple gestation <input type="checkbox"/> Prev C/S type _____ Reason _____ <input type="checkbox"/> PIH <input type="checkbox"/> Chronic HTN <input type="checkbox"/> Diabetes _____ <input type="checkbox"/> Stillbirth/demise <input type="checkbox"/> Neodeath <input type="checkbox"/> Anomalies <input type="checkbox"/> Precipitous labor (<3 H) <input type="checkbox"/> Macrosomia <input type="checkbox"/> PP Hemorrhage <input type="checkbox"/> Hx Transfusion reaction <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Other _____					<input type="checkbox"/> WNL Variance: <input type="checkbox"/> Heartburn <input type="checkbox"/> Epigastric pain <input type="checkbox"/> Nausea <input type="checkbox"/> Vomiting <input type="checkbox"/> Diarrhea <input type="checkbox"/> Constipation <input type="checkbox"/> Pain <input type="checkbox"/> Wt. Gain < 2lbs / month** <input type="checkbox"/> Recent change in appetite of < 50% of usual intake for > 5 days <input type="checkbox"/> _____				
Latest risk assessment <input type="checkbox"/> None 1. _____ 3. _____ 2. _____ 4. _____									
Signature _____ Date _____ Time _____					INTEGUMENTARY				
					FETAL ASSESSMENT				
					EARS, NOSE, THROAT, AND EYES				
					PSYCHOSOCIAL				
					Tobacco use				
					PAIN ASSESSMENT				
					<input type="checkbox"/> Denies <input type="checkbox"/> Yes Amt _____ <input type="checkbox"/> Denies <input type="checkbox"/> Yes Amt _____ <input type="checkbox"/> Denies <input type="checkbox"/> Yes Amt type _____ <input type="checkbox"/> English <input type="checkbox"/> Spanish _____				
					1. Do you have any ongoing pain problems? <input type="checkbox"/> No <input type="checkbox"/> Yes 2. Do you have any pain now? <input type="checkbox"/> No <input type="checkbox"/> 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.				

ESSENTIALS of Maternity, Newborn, & Women's Health

Nursing - THIRD EDITION

Susan Scott Ricci, ARNP, MSN, MEd

FIGURE 14.13

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

Maternal Health History

A maternal health history should include typical biographical data such as the woman's name and age and the name of the delivering health care 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, Rh status, and group B streptococcal status; past pregnancy and obstetric history; past health history and family history; prenatal education; list of medications; risk factors such as diabetes, hypertension, and 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 so that an individualized plan of care can be developed 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 has diabetes, 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 staff and the woman to initiate proper care.

It is important 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 14.2](#)) to help plan culturally competent care during labor and birth.

BOX 14.2: 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?

Adapted from Bowers, P. (2012). Cultural perspectives in childbearing. *Nursing Spectrum*. Retrieved from <http://ce.nurse.com/ce263-60/cultural-perspectives-in-childbearing>; and Callister, L., Holt, S., & Kuhre, M. (2010). Giving birth: the voices of Australian women. *Journal of Perinatal & Neonatal Nursing*, 24(2), 128–136.

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 dilation and degree of effacement
- Fetal status, including heart rate, position, and station
- Pain level

These assessment parameters 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 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. In addition, if the following test results are not included in the maternal prenatal history, it may be necessary to perform them at this time. They include syphilis screening, hepatitis B (HbsAg) screening, group B streptococcus, HIV testing (if woman gives consent), and possible drug screening if the history is positive.

ESSENTIALS of Maternity, Newborn, & Women's Health

Nursing - THIRD EDITION Susan Scott Ricci, ARNP, MSN, MEd

Group B streptococcus (GBS) is a gram-positive organism that colonizes in the female genital tract and rectum and is present in 10% to 30% of all healthy women (Mattson & Smith, 2011). These women are asymptomatic carriers but can cause GBS disease of the newborn through vertical transmission during labor and horizontal transmission after birth. The mortality rate of infected newborns varies according to time of onset (early or late). Risk factors for GBS include maternal intrapartum fever, prolonged ruptured membranes (>12 to 18 hours), previous birth of an infected newborn, and GBS bacteriuria in the present pregnancy.

In 2010, the Centers for Disease Control and Prevention (CDC), ACOG and the American Academy of Pediatrics issued renewed guidelines that advised universal screening of pregnant women at 35 to 37 weeks' gestation for GBS and intrapartum antibiotic therapy for GBS carriers. These new guidelines reaffirmed the major prevention strategy—universal antenatal GBS screening and intrapartum antibiotic prophylaxis for culture-positive and high-risk women—and include new recommendations for laboratory methods for identification of GBS colonization during pregnancy, algorithms for screening and intrapartum prophylaxis for women with preterm labor and premature rupture of membranes, updated prophylaxis recommendations for women with a penicillin allergy, and a revised algorithm for the care of newborn infants (Baker, Byington, & Polin, 2011). Maternal infections associated with GBS include acute chorioamnionitis, endometritis, and urinary tract infection. Neonatal clinical manifestations include pneumonia and sepsis. Identified GBS carriers receive IV antibiotic prophylaxis (penicillin G or ampicillin) at the onset of labor or ruptured membranes.

The ACOG, CDC, AWHONN and the U.S. Preventive Services Task Force all recommend that all pregnant women be offered a screening test for HIV antibodies on their first prenatal visit, again during the third trimester if engaging in high-risk behaviors, and on admission to the labor and birth area (Gilbert, 2011).

If her HIV status is not documented, the woman being admitted to the labor and birth suite should have rapid HIV testing done. To reduce perinatal transmission, women who are HIV positive are given zidovudine (ZDV) (2 mg/kg IV over an hour, and then a maintenance infusion of 1 mg/kg per hour until birth) or a single 200-mg oral dose of nevirapine at the onset of labor; the newborn is given ZDV orally (2 mg/kg body weight every 6 hours) and should be continued for 6 weeks (Gardner et al., 2011). To further reduce the risk of perinatal transmission, ACOG and the U.S. Public Health Service recommend that women who are infected with HIV and have plasma viral loads of more than 1,000 copies per milliliter be counseled regarding the benefits of elective cesarean birth (Reshi & Lone, 2010). Additional interventions to reduce the transmission risk would include avoiding use of a scalp electrode for fetal monitoring or doing a scalp blood sampling for fetal pH, delaying amniotomy, encouraging formula feeding after birth, and avoiding invasive procedures such as forceps or vacuum-assisted devices. The nurse stresses the importance of all interventions and the goal to reduce transmission of HIV to the newborn.

Continuing Assessment During the First Stage of Labor

After the admission assessment 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

ESSENTIALS of Maternity, Newborn, & Women's Health

Nursing - THIRD EDITION

Susan Scott Ricci, ARNP, MSN, MEd

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 and every 2 hours after membranes have ruptured to detect an elevation indicating an ascending infection.

Vaginal examinations are performed periodically to track labor progress. This assessment information is 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, before any procedure, and before administering analgesia or anesthesia to the mother. [Table 14.3](#) summarizes assessments for the first stage of labor.

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 hr; more frequently if membranes are ruptured	Every 4 hr; more frequently if membranes are ruptured	Every 4 hr; more frequently if membranes are ruptured
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

ESSENTIALS of Maternity, Newborn, & Women's Health Nursing - THIRD EDITION

Susan Scott Ricci, ARNP, MSN, MEd

Assessments *	Latent Phase (0–3 cm)	Active Phase (4–7 cm)	Transition (8–10 cm)
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 examination	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

Adapted from Gilbert, E. S. (2011). *Manual of high risk pregnancy and delivery* (5th ed.). St. Louis, MO: Mosby Elsevier; Groll, K. G. (2012). *Fast facts for the labor and delivery nurse*. New York, NY: Springer; and Mattson, S., & Smith, J. E. (2011). *Core curriculum for maternal–newborn nursing* (4th ed.), St. Louis, MO: Saunders Elsevier.

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.

Remember Sheila from the chapter-opening scenario? What is the nurse's role with Sheila in active labor? What additional comfort measures can the labor nurse offer Sheila?

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:

ESSENTIALS of Maternity, Newborn, & Women's Health

Nursing - **THIRD EDITION** Susan Scott Ricci, ARNP, MSN, MEd

- 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 backrubs, 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 on contractions
- Changing bed linens and gown as needed
- Keeping the 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
- 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
- Communicating requests from the woman to appropriate personnel
- Respecting the woman's sense of privacy by covering her when appropriate
- Offering human presence by being present with the woman, not leaving her alone for long periods
- Being patient with the natural labor pattern to allow time for change
- Encourage maternal movement throughout labor to increase the woman's level of comfort
- Dim the lights in the room when pushing and request softened voices be used to maintain a calm and centered ambiance
- Reporting any deviations from normal to the health care professional so that interventions can be initiated early to be effective (Groll, 2012; Steen, 2012)

See [Nursing Care Plan 14.1](#).

Remember Sheila, who was admitted in active labor? She has progressed to the transition phase (dilated 8 cm) and is becoming increasingly more uncomfortable. She is using a patterned-paced breathing pattern now but is thrashing around in the hospital bed.

Teaching Guidelines 14.1: POSITIONING DURING THE FIRST STAGE OF LABOR

- Walking with support from the partner (adds the force of gravity to contractions to promote fetal descent)
- Slow-dancing position with the 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) (Mattson & Smith, 2011; Tharpe et al., 2013).

b Nursing Management During the Second Stage of Labor

NURSING CARE PLAN 14.1: Overview of a 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 examination 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 examination; 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.

ESSENTIALS of Maternity, Newborn, & Women's Health Nursing - THIRD EDITION

Susan Scott Ricci, ARNP, MSN, MEd

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

Outcome Identification and Evaluation

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

Interventions: *Promoting Positive Coping Strategies*

- Provide instruction regarding the labor process to allay anxiety.
- Reorient the woman to the physical environment and equipment as necessary to keep her 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 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 the client as much as possible to provide comfort and support.

NURSING DIAGNOSIS: Acute pain related to uterine contractions and stretching of the cervix and birth canal

Outcome Identification and Evaluation

The 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.

Interventions: *Providing Pain Relief*

- 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.
- 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 back counterpressure to reduce pain.
- Assist with use of relaxation and breathing techniques to promote relaxation.

ESSENTIALS of Maternity, Newborn, & Women's Health

Nursing - **THIRD EDITION** Susan Scott Ricci, ARNP, MSN, MEd

- Use touch appropriately (backrub) when desired by the woman to promote comfort.
- Integrate use of nonpharmacologic measures for 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 multiple vaginal examinations following rupture of membranes and tissue trauma

Outcome Identification and Evaluation

The client will remain free of infection as evidenced by the 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.

Interventions: *Preventing Infection*

- Monitor vital signs (every 2 hours after rupture of membranes [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 examinations 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.

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, implementing 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 (Cooke, 2010). Women in the past gave birth unaided by following their bodies signals to birth their babies, so the role of the nurse should be to support the woman in her choice of pushing method and to encourage confidence in her maternal instinct of when and how to push. In the absence of any complications, nurses should not be controlling this stage of labor, but empowering women to achieve a satisfying experience. The primary rationale for directing women to push is to shorten the second stage of labor. Common practice in many labor units is still to coach women to use closed glottis pushing with every contraction, starting at 10 cm of dilation, a practice that is not supported by research. Research suggests that directed pushing during

ESSENTIALS of Maternity, Newborn, & Women's Health

Nursing - **THIRD EDITION** Susan Scott Ricci, ARNP, MSN, MEd

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 (Naranjo, Puertas, & López, 2011).

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. Supporting spontaneous pushing and encouraging women to choose their own method of pushing should be accepted as best clinical practice (Prins, Boxem, Lucas, & Hutton, 2011).

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 fecal incontinence. Risks for third- or fourth-degree lacerations included nulliparity, being Asian or Pacific Islander, increased birth weight of newborn, operative vaginal birth, episiotomy, and longer second stage of labor. Increasing body mass index was associated with fewer lacerations (Landy et al., 2011). The primary care provider should repair any lacerations 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. Certified nurse midwives can cut and repair episiotomies, but they frequently use alternative measures if possible.

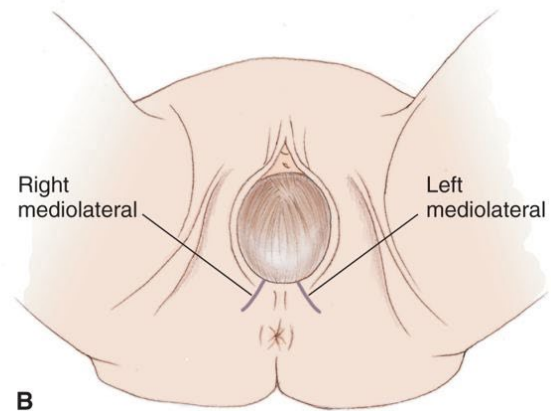
Take Note!

Further research needs to be done to validate the efficacy of natural measures versus the episiotomy.

The midline episiotomy is the most commonly used one in the United States because it can be easily repaired and causes the least amount of pain. The application of warmed compresses is associated with a decrease in trauma to the perineal area and reduced the need for an episiotomy (Aasheim, Nilsen, Lukasse, & Reinart, 2011). Routine episiotomy has declined since liberal usage has been discouraged by ACOG. Anal sphincter laceration rates with spontaneous vaginal delivery have decreased, likely reflecting the decreased usage of episiotomy. The decline in operative vaginal delivery corresponds to a sharp increase in cesarean births, which may indicate that practitioners are favoring cesarean births for difficult births (Browne, Jacobs, Lahiff, & Miller, 2010). [Figure 14.14](#) shows episiotomy locations.



A



B

FIGURE 14.14

Location of an episiotomy. (A) Midline episiotomy. (B) Right and left mediolateral episiotomies.

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. 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](#)).

TABLE 14.4: SUMMARY OF ASSESSMENTS DURING THE SECOND, THIRD, AND FOURTH STAGES OF LABOR

ESSENTIALS of Maternity, Newborn, & Women's Health

Nursing - THIRD EDITION Susan Scott Ricci, ARNP, MSN, MEd

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 hour
Bearing down/pushing	Assist with every effort	None	None
Vaginal discharge	Observe for signs of descent—bulging of perineum, crowning	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

Adapted from Groll, K. G. (2012). *Fast facts for the labor and delivery nurse*. New York, NY: Springer; Institute for Clinical Systems Improvement [ICSI]. (2011). *ICSI health care guidelines: Management of labor*. Retrieved from http://www.icsi.org/guidelines_and_more/gloss_prot/womens_health/labor/labor_management_of_2.html; and Mattson, S., & Smith, J. E. (2011). *Core curriculum for maternal–newborn nursing* (4th ed.), St. Louis, MO: Saunders Elsevier.

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.

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. 14.15](#)).



FIGURE

14.15

Crowning.

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 do so.

Nursing Interventions

ESSENTIALS of Maternity, Newborn, & Women's Health

Nursing - THIRD EDITION

Susan Scott Ricci, ARNP, MSN, MEd

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, suggest that she keep her eyes open during the contractions and look toward where the infant is coming out. Changing positions frequently 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, takes advantage of gravity to assist the fetus to descend, and gives the mother a sense of being safe and in control of the labor process (Steen, 2012). 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
- 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, encouraging 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 do so
- Delaying pushing for up to 90 minutes after complete dilation
 - 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
 - Pushing several times with each contraction
 - Pushing with an open glottis and slight exhalation (Kelly et al., 2010)
- 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 to assess blood pressure, pulse, respirations, uterine contractions, bearing-down efforts, FHR, and 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 time frame 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

ESSENTIALS of Maternity, Newborn, & Women's Health

Nursing - **THIRD EDITION** Susan Scott Ricci, ARNP, MSN, MEd

- 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)

Sheila is completely dilated now and experiencing the urge to push. How can the nurse help Sheila with her pushing efforts? What additional interventions can the labor nurse offer Sheila now?

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, cleanse the vulva and perineal areas. The primary health care 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 health care provider suctions the newborn's mouth first (because the newborn is an obligate nose breather) and then the nares with a bulb syringe to prevent aspiration of mucus, amniotic fluid, or meconium ([Fig. 14.16](#)). The umbilical cord is double-clamped and cut between the clamps. With the first cries of the newborn, the second stage of labor ends. For care of the woman undergoing a surgical birth, the reader is referred to [Chapter 21](#).

ESSENTIALS of Maternity, Newborn, & Women's Health
Nursing - THIRD EDITION Susan Scott Ricci, ARNP, MSN, MEd





FIGURE 14.17

An example of a security sensor applied to a newborn's arm.

Sheila gave birth to a healthy 7-pound, 7-ounce baby girl. She is eager to hold and nurse her newborn. What is the initial care of the newborn? How can the nurse meet the needs of both the newborn and Sheila, who is exhausted but eager to bond with her newborn?

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

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Nursing - **THIRD EDITION** Susan Scott Ricci, ARNP, MSN, MEd

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.

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 breast-feeding 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 shiver and feel cold shortly after giving birth.

Take Note!

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 breast-feeding.

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. 14.18](#))

• FIGURE 14.18

Placenta. (A) Fetal side. (B) Maternal side.

- Assessing for any perineal trauma, such as the following, before allowing the birth attendant to leave:

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- 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 agent 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 mid-line, 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

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Nursing - THIRD EDITION Susan Scott Ricci, ARNP, MSN, MEd

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 and therefore is not a reliable early indicator of shock. Fever is indicative of dehydration (less than 100.4° F or 38° C) or infection (above 101° 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 massaging.

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 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 bogginess.

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)

ESSENTIALS of Maternity, Newborn, & Women's Health

Nursing - **THIRD EDITION** Susan Scott Ricci, ARNP, MSN, MEd

- Encouraging the woman to void by ambulating to the 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 about and sensitive to typical cultural practices after birth
- Assisting the mother to nurse, if she chooses, during the recovery period to promote uterine firmness (the release of oxytocin from the posterior pituitary gland 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
- Explaining 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 (Leonard, 2012)

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 the pregnancy and initiate appropriate interventions to provide optimal care for the client.
- Completing an admission assessment includes taking a maternal health history; performing a 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, and periodic changes in the rate (accelerations and decelerations).

ESSENTIALS of Maternity, Newborn, & Women's Health

Nursing - **THIRD EDITION** Susan Scott Ricci, **ARNP, MSN, MEd**

- The nurse monitoring the laboring client needs to be knowledgeable about which category the FHR pattern is in so that appropriate interventions can be instituted.
- For a category III FHR pattern, the nurse should notify the health care 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 baseline 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 support 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.