Intrapartum and Postpartum Care of the Mother

The goal of all labor and delivery units is a safe birth for mothers and their newborns. At the same time, staff should attempt to make the patient feel welcome, comfortable, and informed throughout the labor and delivery process. Ongoing risk assessment should determine appropriate care for the woman. The father, partner, or other primary support person should be made to feel welcome and should be encouraged to participate throughout the labor and delivery experience.

Labor and delivery is a normal physiologic process that most women experience without complications. Obstetric staff can greatly enhance this experience for the woman and her family by exhibiting a caring attitude and helping them understand the process. Efforts to promote healthy behaviors can be as effective during labor and delivery as they are during antepartum care. Physical contact between the newborn and the parents in the delivery room should be encouraged. Every effort should be made to foster family interaction and to support the desire of the family to be together.

Because intrapartum complications can arise, sometimes quickly and without warning, ongoing risk assessment and surveillance of the mother and the fetus are essential. The hospital, including a birthing center within a hospital complex, or freestanding birthing centers that meet the standards of the Accreditation Association for Ambulatory Health Care or the Joint Commission or the American Association of Birth Centers provide the safest setting for labor, delivery, and the postpartum period. This setting ensures accepted standards of safety that cannot be matched in a home-birthing situation. The collection and analysis of data on the safety and outcome of deliveries in other settings have been problematic. The development of approved, well-designed research protocols, prepared in consultation with obstetric departments and their related insti-
tutional review boards, is appropriate to assess safety, feasibility, and birth outcomes in such settings. Until such data are available, home births are not encouraged. There may be exceptional situations, however, such as in geographically isolated areas, in which special programs are required.

**Admission**

Pregnant women may come to a hospital’s labor and delivery area not only for obstetric care but also for evaluation and treatment of nonobstetric illnesses. However, a nonobstetric condition, such as highly transmissible infectious diseases (eg, varicella), is best treated in another area of the hospital. The obstetric department should establish policies in consultation with other hospital units or personnel, such as the emergency department or infectious disease director, for coordinated care of pregnant women. Departments should agree on the conditions that are best treated in the labor and delivery area and those that should be treated in other hospital-care units. Patients with medical or surgical conditions that could reasonably be expected to result in obstetric consequences should be evaluated by qualified obstetric-care providers. The priority of that evaluation and the site where it is best performed should be determined by the patient’s needs (including gestational age of the fetus) and the care unit’s ability to provide for those needs. The obstetric department also should establish policies for the admission of nonobstetric patients according to state regulations (see “Nonobstetric Patients” in Chapter 2). Federal and state regulations address the management and treatment of patients in hospital acute-care areas, including labor and delivery (see Appendix F).

Written departmental policies regarding triage of patients who come to a labor and delivery area should be reviewed periodically for compliance with appropriate regulations. A pregnant woman who comes to the labor and delivery area should be evaluated in a timely fashion. Obstetric nursing staff may perform this initial evaluation, which should minimally include assessment of:

- Maternal vital signs
- Fetal heart rate
- Uterine contractions

The responsible obstetric provider should be informed promptly if any of the following findings are present or suspected:

- Vaginal bleeding
- Acute abdominal pain
• Temperature of (100.4°F) or higher
• Preterm labor
• Preterm rupture of membranes (PROM)
• Hypertension
• Nonreassuring fetal heart rate pattern

Any patient who is suspected to be in labor or who has rupture of the membranes or vaginal bleeding should be evaluated promptly in an obstetric service area. Whenever a pregnant woman is evaluated for labor, the following factors should be assessed and recorded in the patient’s permanent medical record:

• Maternal vital signs
• Frequency and duration of uterine contractions
• Documentation of fetal well-being
• Urinary protein concentration
• Cervical dilatation and effacement, unless contraindicated (eg, placenta previa, preterm PROM) or cervical length as ascertained by transvaginal ultrasonography
• Fetal presentation and station of the presenting part
• Status of the membranes
• Date and time of the patient’s arrival and of notification of the provider
• Estimation of fetal weight and assessment of maternal pelvis

If the patient is in prodromal or early labor and has no complications, admission to the labor and delivery area may be deferred after initial evaluation and documentation of fetal well-being (see Appendix F). A patient with a transmissible infection should be admitted to a site where isolation techniques may be followed according to hospital policy.

If a woman has received prenatal care and a recent examination has confirmed the normal progress of pregnancy, her admission evaluation may be limited to an interval history and physical examination directed at the presenting condition. Previously identified risk factors should be recorded in the medical record. If no new risk factors are found, attention may be focused on the following historic factors:

• Time of onset and frequency of contractions
• Status of the membranes
• Presence or absence of bleeding
• Fetal movement
• History of allergies
• Time, content, and amount of the most recent food or fluid ingestion
• Use of any medication

Serologic testing for hepatitis B virus surface antigen may be necessary as described in Chapter 9. Women who have not received prenatal care or who received care late in pregnancy are more likely to have sexually transmitted diseases and substance abuse problems. Social problems, such as poverty and family conflict, also may affect patients’ health. A shortened obstetric hospital stay poses even greater problems for patients who have had no prenatal care. Routine obstetric screening tests (eg, hemoglobin, type and Rh), social intervention, and additional education may be needed within this limited period.

If no complications are detected during initial assessment in the labor and delivery area and if contraindications have been ruled out, qualified nursing personnel may perform the initial pelvic examination. Once the results of the examination have been obtained and documented, the provider responsible for the woman’s care in the labor and delivery area should be informed of her status. The provider can make a decision regarding her management. The timing of the provider’s arrival in the labor area should be based on this information and hospital policy. If epidural, spinal, or general anesthesia is anticipated, or if conditions exist that place the patient at risk for requiring rapid institution of an anesthetic, anesthesia personnel should be informed of the patient’s presence soon after her admission. If a preterm delivery, infected or depressed newborn, or newborn with a prenatally diagnosed congenital anomaly is expected, the provider who will assume responsibility for the newborn’s care should be informed. When the patient has been examined and instructions regarding her management have been given and noted on her medical record, all necessary consent forms should be signed and incorporated into the medical record.

By 36 weeks of gestation, preregistration for labor and delivery at the hospital should be confirmed. By 36 weeks of gestation, a copy of the prenatal medical record (see “ACOG Antepartum Record” in Appendix A) should be on file in the hospital’s labor registration area, including information pertaining to the patient’s antepartum course, or equivalent electronic medical record should be accessible. Consideration should be given to providing periodic updates to the prenatal medical record on file.
At the time of a patient’s admission to the labor and delivery area, pertinent information from the prenatal record should be noted in the admission records. Because labor and delivery is a dynamic process, all entries into a patient’s medical record should include the date and time of occurrence. Blood typing and screening tests need not be repeated if they were performed during the antepartum period and no antibodies were present, provided that the report is in the hospital records. If results of the woman’s antenatal laboratory evaluation are not known and cannot be obtained, blood typing, Rh D type determination, hepatitis B virus antigen testing, and serologic testing for syphilis should be performed before the woman is discharged. State laws governing testing of umbilical cord blood may vary. Serologic testing for human immunodeficiency virus (HIV) infection and other tests should be encouraged and performed according to state law. Rapid HIV testing can be done in labor if the mother’s HIV status is unknown (see additional information on rapid HIV testing in Chapter 4 under “Routine Testing” and Chapter 9 under “Human Immunodeficiency Virus”). Collection of umbilical cord blood may be useful for subsequent evaluation of ABO incompatibility if the mother is type O. Policies should be developed to ensure expeditious preparation of blood products for transfusion if the patient is at increased risk of hemorrhage or if the need arises.

At all times in the hospital labor and delivery area, the safety and well-being of the mother and the fetus are the primary concern and responsibility of the obstetric staff. This concern, however, should not unnecessarily restrict the activity of women with uncomplicated labor and delivery or exclude people who are supportive of her. The woman should have the option to stay out of bed during the early stages of labor, to ambulate, and to rest in a comfortable chair as long as the fetal status is reassuring. Concerns such as showers during labor, placement of intravenous lines, use of fetal heart rate monitoring, and restrictions on ambulation should be reviewed in departmental policies, taking into consideration physicians’ preferences as well as patients’ desires, comfort, privacy, and sense of participation. Likewise, the use of drugs for relief of pain during labor and delivery should depend on the needs and desires of the woman. The development of a birth plan that has been discussed previously with a woman’s provider and placed in her medical record may promote her participation in and satisfaction with her care.

The woman’s health care team should communicate regarding all factors that may pose a risk to her, her fetus, or her newborn. Obstetric departmental policies should include recommendations for transmitting to the nursery those
maternal and fetal historical and laboratory data that may affect the care of the newborn. Information on conditions that may influence neonatal care also should be communicated. The lack of such data, perhaps because of a lack of prenatal care, also should be made known to the nursery personnel. The physician who will care for the newborn should be identified on the maternal medical record (see Appendix A). Health care professionals who provide anesthesia should be notified of women who may be at significant risk of complications from anesthetic procedures (eg, women with hypertension or who are morbidly obese).

**Labor**

The onset of true labor is established by observing progressive change in a woman’s cervix in the setting of regular, phasic, uterine contractions. This may require two or more cervical examinations that are separated by an adequate period to observe change. Even a well-prepared woman may arrive at the hospital labor and delivery area before true labor has begun. A policy that allows for adequate evaluation of patients for labor and that prevents unnecessary admissions to the labor and delivery unit is advisable (see Appendix F).

**False Labor at Term**

Uterine contractions in the absence of cervical change commonly are called false labor. Treatment for this condition should be based on individual circumstances. Patients who are having uterine contractions and are not yet in active labor may be observed for evidence of cervical change in a casual, comfortable area. After observation and evaluation by appropriate hospital-designated personnel and assurance of fetal well-being, the patient may be discharged (see Appendix F).

**Premature Rupture of Membranes at Term**

Premature rupture of membranes is considered to be present when there is leakage of amniotic fluid before the onset of labor. Preparations for labor and delivery should begin when PROM occurs, whether at or before term, because labor frequently ensues. Management of PROM is not uniform, and several acceptable strategies exist for the care of patients with PROM. These strategies should address methods of diagnosis, induction of labor, and timing and use of antibiotics for both prophylaxis and treatment of the mother and the fetus.
The diagnosis of PROM is established by history, physical examination, and laboratory test result confirmation. Diagnosis based on history alone is correct in more than 90% of patients. Nevertheless, all patients reporting symptoms that suggest ruptured membranes should be examined with a sterile speculum as soon as possible to confirm this diagnosis. In any labor occurring after rupture of membranes, vaginal examinations should be limited in number and attention paid to clean technique. Gross pooling of amniotic fluid in the vagina is nearly 100% diagnostic of PROM. Supportive laboratory testing includes vaginal pH, fern testing, and ultrasound estimation of amniotic fluid volume. The obstetric providers who perform the examination to confirm or rule out PROM should be aware of the causes of false-positive and false-negative test results that occur with the use of pH and fern testing. These causes include leakage of alkaline urine, cervical mucus, bacterial vaginosis, and blood. Given equivocal findings, exclusion of PROM remote from term may require an amniocentesis with instillation of indigo carmine dye.

Management is determined by the presence or absence of PROM and gestational age. For women with PROM at term, labor should be induced at the time of presentation to reduce the risk of maternal and neonatal complications. Delivery is recommended when PROM occurs at or beyond 34 weeks of gestation. With PROM at 32–33 completed weeks of gestation, labor induction may be considered if fetal pulmonary maturity has been documented. Patients with PROM before 32 weeks of gestation should be managed expectantly until 33 completed weeks of gestation if no maternal or fetal contraindications exist. A 48-hour course of intravenous ampicillin and erythromycin followed by 5 days of amoxicillin and erythromycin is recommended during expectant management of preterm PROM remote from term to prolong pregnancy and to reduce infectious- and gestational age-dependent neonatal morbidity. For a woman with preterm PROM and a viable fetus, the safety of expectant management at home has not been established.

If intraamniotic infection is diagnosed at any gestational age, antibiotics should be initiated and labor should be induced. The diagnosis of intraamniotic infection alone is not an indication for cesarean delivery, which should be reserved for obstetric indications only. In the presence of chorioamnionitis, the duration of PROM does not correlate with the risk of neonatal sepsis.

Management of Labor

Ideally, every woman admitted to the labor and delivery area should know who her principal, designated health care provider will be. Members of the obstetric
team should observe the patient to follow the progress of labor, record her vital signs and the fetal heart rate in her medical record at regular intervals, and make an effort to ensure her understanding of the events taking place. The provider principally responsible for the patient’s care should be kept informed of her progress and notified promptly of any abnormality. When the patient is in active labor, that provider should be readily available (see “Preface,” and “Cesarean Delivery” in this chapter).

Patients in active labor should avoid oral ingestion of anything except sips of clear liquids, occasional ice chips, or preparations for moistening the mouth and lips. Ideally, intravenous access should be secured when the active phase of labor begins. The progress of labor should be evaluated by periodic vaginal examinations, and her provider should be notified of labor progress. Sterile, water-soluble lubricants may be used to reduce discomfort during vaginal examinations. Antiseptics, such as povidone-iodine and hexachlorophene, have not been shown to decrease infections acquired during the intrapartum period. Furthermore, these agents may produce local irritation and are absorbed through maternal mucous membranes.

For women who are at no increased risk of complications, evaluation of the quality of the uterine contractions and pelvic examinations should be sufficient to detect abnormalities in the progress of labor. Vital signs should be recorded at regular intervals of at least every 4 hours. This frequency may be increased, particularly as active labor progresses, according to clinical signs and symptoms. Documentation of the course of a woman’s labor may include, but need not be limited to, the presence of physicians, midwives, or nurses, position changes, cervical status, oxygen and drug administration, blood pressure levels, temperature, amniotomy or spontaneous rupture of membranes, color of amniotic fluid, and Valsalva maneuver.

**Fetal Heart Rate Monitoring**

Either electronic fetal heart rate monitoring or intermittent auscultation may be used to determine fetal status during labor. Obstetric unit guidelines should clearly delineate the procedures to be followed for using these techniques according to the phase and stage of labor.

The method of fetal heart rate monitoring for fetal surveillance during labor may vary depending on the risk assessment at admission, the preferences of the patient and obstetric staff, and departmental policy. If no risk factors are present at the time of the patient’s admission, a standard approach to fetal surveillance is to determine, evaluate, and record the fetal heart rate every 30 min-
utes in the active phase of the first stage of labor and at least every 15 minutes in the second stage of labor.

If risk factors are present at admission or appear during labor, there is no difference in perinatal outcome between intermittent auscultation and continuous fetal monitoring if one of the following methods for fetal heart rate monitoring is used:

- During the active phase of the first stage of labor, the fetal heart rate should be determined, evaluated, and recorded at least every 15 minutes, preferably before, during, and after a uterine contraction, when intermittent auscultation is used. If continuous electronic fetal heart rate monitoring is used, the heart rate tracing should be evaluated at least every 15 minutes.

- During the second stage of labor, the fetal heart rate should be determined, evaluated, and recorded at least every 5 minutes if auscultation is used. If continuous electronic fetal heart rate monitoring is used, the tracing should be evaluated at least every 5 minutes.

The appropriate use of electronic fetal heart rate monitoring includes recording and interpreting the tracings. Nonreassuring findings should be noted and communicated to the physician or certified nurse midwife so that the appropriate intervention can occur. When a change in the rate or pattern has been noted, it also is important to document a subsequent return to reassuring findings. Terms that describe the fetal heart rate patterns (eg, early, late, variable, or prolonged decelerations; tachycardia and bradycardia; accelerations; and variability) should be used in both medical record entries and verbal communication among obstetric personnel.

Internal fetal heart rate monitoring and internal uterine pressure monitoring may be used to gain further information about fetal status and uterine contractility, respectively. Relative contraindications to internal fetal monitoring include maternal HIV infection and other high-risk factors for fetal infection, including herpes simplex virus and hepatitis B or hepatitis C virus. However, if there are indications for fetal scalp monitoring, it is reasonable in a woman who has a history of recurrent herpes simplex virus and no active lesions.

Fetal scalp or acoustic stimulation that results in acceleration of the fetal heart rate is reassuring when the fetal heart rate pattern is difficult to interpret. If electronic fetal monitoring is used, all fetal heart rate tracings should be identified with the patient’s name, hospital number, and the date and time of admission. All fetal heart rate tracings should be easily retrievable from storage so that the events of labor can be studied in proper relationship to the tracings.
Induction and Augmentation of Labor

Each hospital’s department of obstetrics and gynecology should develop written protocols for preparing and administering oxytocin solution or other agents for labor induction or stimulation. Indications for induction and augmentation of labor should be stated. The qualifications of personnel authorized to administer oxytocic agents for this purpose should be described. The methods for assessment of the woman and the fetus before and during administration of these agents should be specified. Fetal heart rate monitoring should be performed as delineated for high-risk patients in active labor (see “Fetal Heart Rate Monitoring” in this chapter).

Labor is induced when the benefits to either the woman or the fetus outweigh those of continuing the pregnancy. If oxytocin is used, the infusion should be administered by a device that permits precise control of the flow rate to ensure accurate, minute-to-minute control. Oxytocin also is used to augment labor and enhance inadequate uterine contractions in women in whom an assessment of the relationship between the maternal pelvis and fetal size is otherwise normal. Buccal, intranasal, or intramuscular administration of oxytocin should not be used to induce or augment labor.

Various regimens exist for the administration of varying techniques and agents to stimulate uterine contractions. These regimens vary in initial dose, amount of incremental dose increase, and interval between dose increases. Each hospital’s department of obstetrics and gynecology should determine which regimens will be standard for that hospital so that obstetric staff in the labor and delivery area may develop further guidelines for their application to individual patients. Regimens described as low dose and with a less-frequent dosage increase are associated with a lower incidence of uterine hyperstimulation. Higher and more frequent dosage increases are credited with shortening time in labor and reducing the incidence of chorioamnionitis and the number of cesarean deliveries performed for dystocia but increased rates of uterine hyperstimulation.

Cervical Ripening

Cervical ripening may be beneficial if the cervix is unfavorable for induction. Acceptable interventions for preparing an unfavorable cervix for induction include mechanical dilation with laminaria or a 30 mL Foley catheter placed in the cervical canal, use of misoprostol (as detailed in the following paragraphs), and intravaginal or intracervical administration of prostaglandin E₂ (PGE₂) in
doses appropriate for cervical ripening. If the fetus’ estimated gestational age is near term, routine intravenous oxytocin induction or misoprostol administration usually is effective. High-dose PGE\textsubscript{2} suppositories and more concentrated intravenous oxytocin regimens both are effective for terminating a pregnancy complicated by fetal death, especially at a gestational age of 28 weeks or less. Because of the risk of uterine rupture, the use of prostaglandins after 28 weeks of gestation should be discouraged if the woman has had prior transfundal uterine surgery.

Misoprostol, a prostaglandin E\textsubscript{1} analog, has been demonstrated to be an effective agent for cervical ripening and the induction of labor. When compared with placebo, misoprostol use may decrease overall cesarean delivery rates, decrease oxytocin requirements, and achieve higher rates of vaginal delivery within 24 hours of induction. Misoprostol use also compares favorably with the use of intracervical and intravaginal PGE\textsubscript{2} preparations, with many studies demonstrating shorter times to delivery and reduced oxytocin requirements. Misoprostol should not be used for cervical ripening or induction of labor in patients with prior cesarean delivery or previous major uterine surgery.

When given vaginally in doses of 50 µg or more, misoprostol use has been associated with an increased rate of uterine hyperstimulation, uterine tachysystole, and meconium passage. These problems are less common with a dose of 25 µg of misoprostol administered intravaginally every 3–6 hours.

Misoprostol currently is available in 100-µg and 200-µg tablets, and the 100-µg tablet is not scored. If misoprostol is used for cervical ripening and induction, one quarter of a 100-µg tablet (ie, approximately 25 µg) should be considered for the initial dose. Doses should not be administered more frequently than every 3–6 hours. Both fetal heart rate and uterine activity should be monitored carefully in these patients. Doses should be held in the presence of a nonreassuring fetal heart rate or regular and frequent uterine contractions of moderate intensity. Oxytocin should not be administered less than 4 hours after the last misoprostol dose.

When a patient is admitted for labor induction, a physician who has privileges to perform cesarean deliveries should be readily available (see “Preface” and “Cesarean Delivery” in this chapter). The patient’s medical record should document who is the responsible physician. A qualified member of the obstetric team should perform a vaginal examination for evaluation of the cervix before the induction is initiated. Personnel who are familiar with the effects of
the agents used and who are able to identify both maternal and fetal complications should be in attendance during administration of the agent(s).

Hyperstimulation can occur with any of the available chemical techniques of cervical ripening or labor induction or augmentation. When the continuous administration of PGE₂ via vaginal insert is the technique used, the fetal heart rate and uterine activity should be monitored continuously as long as the device is in place and for at least 15 minutes after it is removed.

Induction of labor by “stripping” or “sweeping” the amniotic membranes is a relatively common practice. Risks associated with this procedure include infection, bleeding from an undiagnosed placenta previa or low-lying placenta, and accidental rupture of membranes. Membrane stripping may be associated with a higher frequency of spontaneous labor and with a decreased incidence of postterm gestation.

Artificial rupture of membranes is another method of labor induction that may be used, particularly when the cervix is favorable. Routine early amniotomy results in a modest reduction in the duration of labor but may result in an increased rate of intraamniotic infection and cesarean delivery for fetal heart rate abnormalities, although not overall cesarean delivery rates. Moreover, it would seem reasonable to delay amniotomy in an uncomplicated intrapartum patient with normal fluid unless the cervix is significantly dilated (see “Amnioinfusion” as follows). Care should be taken to palpate for an umbilical cord and to avoid dislodging the fetal head when artificially rupturing membranes. The fetal heart rate should be evaluated and recorded before and immediately after the procedure.

**Amnioinfusion**

The transcervical infusion of sterile, balanced salt solutions during labor (amnioinfusion) may be used to ameliorate severe, variable decelerations in the fetal heart rate tracing that are suspected to be caused by umbilical cord compression. Meta-analysis confirms that amnioinfusion lowers caesarean delivery rates in the setting of oligohydramnios with repetitive variable fetal heart rate decelerations. There is no proven benefit of amnioinfusion for other fetal heart rate abnormalities, such as late decelerations, and the resultant increase in uterine tone may exacerbate underlying uteroplacental vascular insufficiency. Because it is possible to introduce fluid into the uterus at too rapid a rate, each obstetric unit should establish a protocol for intrauterine pressure monitoring during amnioinfusion or limitations of the volume and infusion rate when the technique is used. Based on the totality of published data, routine prophylactic
amnioinfusion for meconium-stained amniotic fluid is not indicated. Prophylactic use of amnioinfusion in this setting should be done only in the setting of additional clinical trials. Data are not available on whether amnioinfusion for fetal heart rate variable decelerations in the presence of meconium-stained fluid decreases meconium aspiration syndrome or other meconium-related morbidities. However, amnioinfusion is a reasonable approach to treatment of repetitive, variable decelerations irrespective of amniotic fluid meconium status.

**Analgesia and Anesthesia**

Management of discomfort and pain during labor and delivery is an essential part of good obstetric practice. It is the responsibility of the obstetrician or certified nurse midwife, in consultation with the anesthesiologist, if appropriate, to develop the most appropriate response to the woman’s request for analgesia or anesthesia. In the absence of a medical contraindication, maternal request is a sufficient medical indication for pain relief during labor.

Some patients tolerate the pain of labor by using techniques learned in childbirth preparation programs. Although specific techniques vary, classes usually seek to relieve pain through the general principles of education, support, relaxation, paced breathing, focusing, and touch. The staff at the bedside should be knowledgeable about these pain management techniques and should be supportive of the patient’s decision to use them.

Unless contraindicated, pharmacologic analgesics to ameliorate the pain of contractions should be made available on request to women in labor. The choice and availability of analgesic and anesthetic techniques depend on the experience and judgment of the obstetrician and anesthesiologist, the physical condition of the patient, the circumstances of labor and delivery, and the personal preferences of the patient. Parenteral pain medications for labor pain decrease fetal heart rate variability and may limit the obstetrician’s ability to interpret the fetal heart rate tracing. Considerations should be given to other agents in the setting of minimal or absent fetal heart rate variability. High doses of narcotics potentially are depressing to both the woman and the fetus, and both patients should be monitored. Barbiturates, tranquilizers, and narcotics can be administered during prodromal and early labor to allow the patient to rest.

Epidural analgesia offers the most effective form of intrapartum pain relief and is used by most women in the United States. A catheter is placed in the epidural space, allowing for a continuous infusion of pain medication during labor. The advantage of this method of analgesia is that the medication may be
titrated over the course of labor as needed. In addition, epidural catheters placed for labor may be dosed and used for cesarean delivery, postpartum tubal ligation, postcesarean pain control, or for repair of obstetric lacerations following vaginal delivery, if needed.

Spinal anesthesia is performed by giving a single injection of anesthesia. This provides excellent pain relief for procedures of limited duration, such as cesarean delivery, postpartum tubal ligation, or for vaginal delivery in a patient who is rapidly progressing in labor.

Combined spinal–epidural analgesia offers the advantages of the rapid onset of spinal analgesia along with the ability to use the indwelling epidural catheter to titrate medication throughout labor. It also may be used and dosed to provide anesthesia for a cesarean delivery and dosed for postcesarean pain control before being removed.

It also should be noted that a low-grade maternal fever might be associated with a normally functioning epidural in the absence of infection. If the temperature is greater than (100.4°F), it may be difficult to differentiate this “epidural temperature” from the temperature associated with chorioamnionitis. In this group of patients, neonatal surveillance blood cultures do not reveal occult infection.

Depending on the technique used, the experience of the anesthesiologist, and the patient’s response, ambulation to some extent may be possible during regional analgesia.

In the past, reports regarding the timing of epidural anesthesia and its effect on the labor course have offered conflicting results. More recent data now indicate that low-dose neuraxial analgesia in early labor does not increase the rate of cesarean delivery and may result in a shorter duration of labor. Thus, there seems to be little justification to withhold this form of pain relief in women in early labor at less than 4 cm cervical dilation.

Paracervical block, when used for pain relief during labor, may result in fetal bradycardia. The fetal heart rate should be monitored closely before, during, and after the administration of paracervical block. Bupivacaine is contraindicated for use in paracervical block. At the time of delivery, local anesthetics may be injected into the tissues of the perineum and the vagina to provide anesthesia for episiotomy and repair of vaginal and perineal lacerations. Local anesthetics also may be injected to perform a pudendal block in patients who did not receive regional anesthesia during labor. This regional block may provide adequate anesthesia for outlet operative deliveries and performance of any necessary episiotomy or repair.
Spinal analgesia using low-dose dilute concentrations of local anesthetics with opioids may provide excellent analgesia with rapid onset for the second stage of labor. Spinal anesthesia with higher-dose local anesthetics can provide profound sensory and motor blockade if needed for maternal indications or to facilitate instrumented vaginal delivery. Although spinal anesthesia can provide adequate pain relief and muscle relaxation for nearly all vaginal deliveries, it typically results in profound sensory and motor blockade, which impairs maternal expulsive efforts. Therefore, spinal anesthesia typically is not administered until delivery is imminent or the physician has made a decision to perform an operative delivery. General anesthesia rarely is necessary for vaginal delivery and should be used only for specific indications.

For most cesarean deliveries, properly administered regional or general anesthesia is effective and has little adverse effect on the newborn. Because of the maternal risks associated with intubation and the possibility of aspiration during induction of general anesthesia, regional anesthesia is the preferred technique and should be available in all hospitals that provide obstetric care. The advantages and disadvantages of both techniques should be discussed with the patient as completely as possible. Examples of circumstances in which rapid induction of general anesthesia may be indicated include a prolapsed umbilical cord with severe fetal bradycardia and ominous fetal heart rate patterns from other or unknown causes.

Analgesia or anesthesia during labor and delivery has little or no lasting effect on the physiologic status of the neonate. No evidence exists that suggests that the administration of analgesia or anesthesia during childbirth per se has a significant effect on the child’s later mental and neurologic development.

Regional anesthesia in obstetrics should be initiated and maintained only by health care providers who are approved through the institutional credentialing process to administer or supervise the administration of obstetric anesthesia. These individuals must be qualified to manage anesthetic complications. An obstetrician may administer the anesthesia if granted privileges for these procedures. However, having an anesthesiologist or anesthetist provide this care permits the obstetrician to give undivided attention to the delivery.

It is the responsibility of the director of anesthesia services to make recommendations regarding the clinical privileges of all anesthesia service personnel. If obstetric analgesia (other than pudendal or local techniques) is provided by obstetricians, the director of anesthesia services should participate with a representative of the obstetric department in the formulation of procedures designed to ensure the uniform quality of anesthesia services throughout the hospital.
Specific recommendations regarding these procedures are provided in the *Accreditation Manual for Hospitals* published by the Joint Commission. The directors of departments providing anesthesia services are responsible for implementing processes to monitor and evaluate the quality and appropriateness of these services in their respective departments.

Regional anesthesia should be administered only after the patient has been examined and the fetal status and progress of labor have been evaluated by a qualified individual. A physician with obstetric privileges who has knowledge of the maternal and fetal status and the progress of labor and who approves initiation of labor anesthesia should be readily available (see “Preface” and “Cesarean Delivery” in this chapter) to deal with any obstetric complications that may arise. When regional anesthesia is administered during labor, the patient’s vital signs should be monitored at regular intervals by a qualified member of the health care team.

When any of the following risk factors are present, anesthetic consultation in advance of delivery may be considered to permit formulation of a management plan:

- Marked obesity
- Severe edema or anatomic abnormalities of the face, neck, or spine, including trauma or surgery
- Abnormal dentition, small mandible, or difficulty opening the mouth
- Extremely short stature, short neck, or arthritis of the neck
- Goiter
- Serious maternal medical problems, such as cardiac, pulmonary, or neurologic diseases
- Bleeding disorders
- Severe preeclampsia
- Previous history of anesthetic complications
- Obstetric complications likely to lead to operative delivery (eg, placenta previa or high-order multiple gestation)

When such risk factors are identified, a physician who is credentialed to provide general and regional anesthesia should be consulted in the antepartum period to allow for joint development of a plan of management, including optimal location for delivery. Strategies thereby can be developed to minimize the need for emergency induction or general anesthesia in women for whom this
would be especially hazardous. For those women at risk, consideration should be given to the planned placement in early labor of an intravenous line and an epidural or spinal catheter with confirmation that the catheter is functional. If a woman at unusual risk of complications from anesthesia is identified (eg, prior failed intubation), strong consideration should be given to antepartum referral of the patient to allow for delivery at a hospital that can manage such anesthesia on a 24-hour basis.

Aspiration is a significant cause of anesthetic-related maternal morbidity and mortality, and the more acidic the aspirate, the greater the harm done. Therefore, prophylactic administration of an antacid before induction of a major regional or general anesthesia is appropriate. Particulate antacids may be harmful if aspirated; a clear antacid, such as a solution of 0.3 mol/L of sodium citrate or a similar preparation, may be a safer choice.

On rare occasions, it may be impossible to intubate an obstetric patient after the induction of general anesthesia. Equipment for emergency airway management, such as the laryngeal mask airway, combi tube, and fiberoptic laryngoscope, should be available whenever general anesthesia is administered.

**Delivery**

**Vaginal Delivery**

Vaginal delivery is associated with less risk of maternal operative and postoperative complications than nonelective cesarean delivery and results in shorter hospital stays. Vaginal delivery requires consideration of:

- The availability of professionals with special skills in neonatal resuscitation
- The availability of anesthesia personnel
- Obstetric attendants for the delivery
- The potential need to move a patient from a LDR room to an operative suite

The risk assessment performed on the patient’s admission, the course of the patient’s labor, the fetal presentation, any abnormalities encountered during the labor process, and the anesthetic technique in use or anticipated for delivery will all have an effect on the need for other professionals. At least one obstetric nurse, preferably the woman’s designated primary nurse for the labor, should be present in the delivery room throughout the delivery. Under no circumstances
should an attempt be made to delay birth by physical restraint or anesthetic means.

Episiotomy may be used to aid in the management of delivery in some situations. The routine use of episiotomy is not necessary and may lead to an increase in the risk of third- and fourth-degree perineal lacerations and a delay in the patient’s resumption of sexual activity. Episiotomy always should be done for specific medical indication. Median episiotomy is associated with higher rates of injury to the anal sphincter and rectum, and mediolateral episiotomy may be preferable to median episiotomy in selected cases.

**Vaginal Birth After Cesarean Delivery**

Despite extensive data regarding the risks and success rates of vaginal birth after cesarean delivery (VBAC), there is relatively little information regarding how labor should be conducted (see “Vaginal Birth After Cesarean Delivery” in Chapter 4). Examples of the information that is available are listed as follows:

- Limited data suggest that external cephalic version for breech presentation may be as successful for VBAC candidates as for women who have not undergone previous cesarean delivery.

- The use of prostaglandins for cervical ripening or labor induction in VBAC candidates is discouraged, as noted previously (see “Cervical Ripening” in this chapter). If induction of labor is necessary for a clear and compelling clinical indication, the potential increased risk of uterine rupture with the use of prostaglandins should be discussed with the patient and documented in the medical record.

- Oxytocin may be used for both labor induction and augmentation with close patient monitoring in VBAC candidates, although such inductions are associated with a nearly 50% increased risk of uterine rupture compared with candidates having spontaneous labor.

- Once labor has begun, the patient should be evaluated promptly. Continuous electronic monitoring of both fetal heart rate and uterine contractions is recommended. The most common sign of uterine rupture is a nonreassuring fetal heart rate pattern with variable decelerations that may evolve into late decelerations, bradycardia, and undetectable fetal heart rate. Personnel familiar with the potential complications of VBAC should be vigilant for nonreassuring fetal heart rate patterns and inadequate progress in labor. Because uterine rupture may be cata-
strophic and evolve rapidly, VBAC should be attempted in institutions equipped to respond to emergencies with physicians immediately available to provide emergency care, including emergent cesarean delivery.

- Epidural analgesia and anesthesia may be used safely during a trial of labor and planned VBAC. Assurance of adequate pain relief during labor may encourage more women to choose a trial of labor. Success rates for VBAC are similar in women who do and those who do not receive epidural analgesia, as well as in those women who receive other types of pain relief. Epidural analgesia rarely masks the signs or symptoms of uterine rupture. The anesthesia service should be available whenever there is a patient attempting VBAC in active labor on the labor floor.

The need to explore the uterus after a successful VBAC is controversial. Most asymptomatic scar dehiscences heal well, and there is no data to suggest that future pregnancy outcome is improved if the dehiscence is surgically repaired versus spontaneous healing. Excessive vaginal bleeding or signs of hypovolemia at delivery require prompt and complete assessment of the previous scar and the entire genital tract.

**Operative Vaginal Delivery**

Forceps and vacuum extraction are valuable tools to perform operative vaginal delivery. Operator experience and preference should determine which instrument is used in a particular situation. The vacuum extractor is associated with an increased incidence of neonatal cephalohematoma, retinal hemorrhages, and jaundice when compared with forceps delivery. Forceps delivery, on the other hand, is associated with a higher rate of maternal perineal injuries. Neonatal care providers should be made aware of the mode of delivery to observe for potential complications associated with operative vaginal delivery. The following definitions and indications relate to both techniques.

**Station.** Station refers to the relationship of the estimated distances, in centimeters, between the leading bony portion of the fetal head and the level of the maternal ischial spines. In classifying forceps and vacuum extraction procedures, the station of the fetal head should be noted. Engagement of the head occurs when the biparietal diameter has passed through the pelvic inlet. It is clinically diagnosed when the leading bony portion of the fetal head is at or below the level of the ischial spines (station 0 or more). The preferred method to describe station beyond the level of the ischial spines is to estimate centimeters (+1 to +5 cm) below the spines.
Outlet Operative Vaginal Delivery. Outlet operative vaginal delivery is the application of forceps or vacuum when 1) the fetal scalp is visible at the introitus without separating the labia, 2) the fetal skull has reached the pelvic floor, 3) the fetal sagittal suture is in the anterior–posterior diameter or in the right or left occiput anterior or posterior position, and 4) the fetal head is at or on the perineum. According to this definition, rotation cannot exceed 45 degrees. There is no difference in perinatal outcome when deliveries involving the use of outlet operative vaginal deliveries are compared with similar spontaneous deliveries, and no data support the concept that rotating the head on the pelvic floor 45 degrees or less increases the rate of morbidity.

Low Operative Vaginal Delivery. Low operative vaginal delivery is the application of forceps or vacuum when the leading point of the fetal skull is at station +2 or more and is not on the pelvic floor. Low operative vaginal delivery applications have two subdivisions: 1) rotation 45 degrees or less (eg, left or right to occiput anterior, or left or right occipitoposterior to occiput posterior) and 2) rotation more than 45 degrees. Although rotation of the fetal head often accompanies the use of the vacuum extractor, the vacuum never should be used to provide a direct rotational force to the fetal scalp.

Midpelvis Operative Vaginal Delivery. Midpelvis operative vaginal delivery is the application of forceps or vacuum when the fetal head is engaged but the leading point of the skull is above station +2. Under very unusual circumstances, such as the sudden onset of severe fetal or maternal compromise, application of forceps or vacuum above station +2 may be attempted while simultaneously initiating preparations for a cesarean delivery in the event that the operative vaginal delivery maneuver is unsuccessful. Neither forceps nor vacuum should be applied to an unengaged fetal presenting part or when the cervix is not completely dilated.

Indications for a forceps or vacuum extraction operation and the position and station of the vertex at the time of application of the forceps or vacuum apparatus should be identified in a detailed operative description in the patient’s medical record. These indications include the following items:

- Shortening the second stage of labor—Outlet forceps or vacuum extraction may be used to shorten the second stage of labor in the best interests of the woman or the fetus.
- Ending a prolonged second stage—The following periods are approximate; when these intervals are exceeded without continuing progress,
the risks and benefits of allowing labor to continue should be assessed and documented:

— Nulliparous patients: more than 3 hours with a regional anesthetic or more than 2 hours without a regional anesthetic

— Parous patients: more than 2 hours with a regional anesthetic or more than 1 hour without a regional anesthetic

• Nonreassuring fetal heart rate
• Maternal indications (eg, cardiac disease, exhaustion)

The following conditions are required for forceps or vacuum extraction operations:

• A person with privileges for such procedures
• Assessment of maternal pelvis–fetal size relationship, including clinical pelvimetry, and an estimation of fetal weight, and the position and station of the fetal calvarium
• Adequate anesthesia
• Willingness to abandon attempted operative vaginal delivery
• Ability to perform emergency cesarean delivery (see “readily available” in the “Preface” and in “Cesarean Delivery” in this chapter)

Cesarean Delivery

All hospitals offering labor and delivery services should be equipped to perform emergency cesarean delivery. The required personnel, including nurses, anesthesia personnel, neonatal resuscitation team members, and obstetric attendants, should be in the hospital or readily available (also see “Preface”). Any hospital providing an obstetric service should have the capability of responding to an obstetric emergency. No data correlate the timing of intervention with outcome, and there is little likelihood that any will be obtained. However, in general, the consensus has been that hospitals should have the capability of beginning a cesarean delivery within 30 minutes of the decision to operate. Some indications for cesarean delivery can be appropriately accommodated in longer than 30 minutes. Conversely, examples of indications that may mandate more expeditious delivery include hemorrhage from placenta previa, abruptio placentae, prolapse of the umbilical cord, and uterine rupture. Sterile materials and supplies needed for emergency cesarean delivery should be kept sealed but properly arranged so that the instrument table can be made ready at once for an obstetric emergency.
In-house obstetric and anesthesia coverage should be available in subspecialty-care units. The anesthesia and pediatric staff responsible for covering the labor and delivery unit should be informed in advance when a complicated delivery is anticipated and when a patient with risk factors requiring a high-acuity level of care is admitted.

Before elective, repeat cesarean delivery, the maturity of the fetus should be established. For patients with an indication for an elective repeat cesarean delivery, fetal maturity may be assumed if one of the following criteria is met:

- Fetal heart tones have been documented for 20 weeks by nonelectronic fetoscope or for 30 weeks by Doppler ultrasonography.
- Thirty-six weeks have elapsed since positive results were obtained from a serum or urine human chorionic gonadotropin pregnancy test performed by a reliable laboratory.
- An ultrasound measurement of the crown–rump length obtained at 6–11 weeks of gestation supports a current gestational age of 39 weeks or more.
- Clinical history and physical and ultrasound examinations performed at 12–20 weeks of gestation support a current gestational age of 39 weeks or more.

These criteria are not intended to preclude the use of menstrual dating. If any one criterion confirms gestational age assessment in a patient who has normal menstrual cycles and no immediate antecedent use of oral contraceptives, it is appropriate to schedule delivery at 39 weeks of gestation or later on the basis of menstrual dates. Another option is to await the onset of spontaneous labor. If delivery before 39 weeks of gestation or if the above criteria are not met, an amniocentesis to confirm the presence of indices of fetal pulmonary maturity is required before performing an elective cesarean delivery.

In women requiring cesarean delivery, fetal surveillance should continue until abdominal sterile preparation has begun. If internal fetal heart rate monitoring is in use, it should be continued until the abdominal sterile preparation is complete. Consideration should be given to the use of antiembolic elastic stockings or pneumatic compression boots in women considered at high risk for venous thromboembolism. When the cesarean delivery is performed for fetal indications, consideration should be given to sending the placenta for pathologic evaluation.
Multiple Gestation

The following factors should be considered in the delivery of multiple gestations:

- Labor and delivery—Confirmation of fetal presentations by ultrasound examination is indicated on admission. Each fetus should be monitored continuously during labor. Pediatric and anesthesia personnel should be immediately available, as well as blood bank services.

- Route of delivery—Controversy surrounds the preferred route of delivery for some multiple gestations, especially twins. Although cesarean delivery frequently is used for three or more fetuses, there are reports suggesting that vaginal delivery of triplet gestations, in appropriately monitored patients, is safe. Delivery should be based on individual needs and may depend on the clinician’s practice and experience. In general, twins presenting as vertex–vertex should be anticipated to deliver vaginally. If the presenting twin is nonvertex, cesarean delivery is preferred by most physicians. In vertex–nonvertex presentations, cesarean delivery is not always necessary; vaginal delivery of twin B in the nonvertex presentation is a reasonable option for a neonate with an estimated weight greater than 1,500 g.

- Interval between deliveries—In the absence of other complications, such as bleeding or fetal heart rate abnormalities, the interval between deliveries for twins is not critical in determining the outcome of twin B. Following the delivery of twin A, the fetal heart rate of twin B should be monitored.

- A physician capable of carrying out an emergent cesarean delivery should manage the labor and delivery of patients with multiple gestations.

Support Persons in the Delivery Room

Childbirth is a momentous family experience. Obstetric providers willingly should provide opportunities for those accompanying and supporting the woman giving birth to participate in the process. These support persons must be informed about requirements for safety and must be willing to follow the directions of the obstetric staff concerning behavior in the delivery room. They also should understand the normal events and procedures in the labor and delivery area. They must conform to the dress code required of personnel in attendance in a delivery room. Both the obstetrician and the patient should
consent to the presence of fathers, partners, or other support persons in the delivery room. Support persons should realize that their major function is to provide psychologic support to the mother during labor and delivery. Continuous support during labor from physicians, midwives, nurses, doulas, or lay individuals may have a number of benefits for women. Continuous presence of a support person appears to reduce the likelihood of medication for pain relief, operative vaginal delivery, cesarean delivery, and 5-minute Apgar scores less than 7.

The judgment of the obstetric staff, the individual obstetrician, the anesthesiologist, and the pediatric support personnel, as well as the policies of the hospital, determines whether support persons may be present at a cesarean delivery. A written policy developed by all involved hospital staff is recommended.

**Postpartum Maternal Care**

**Immediate Postpartum Maternal Care**

Monitoring of maternal status postpartum is dictated in part by the events of the delivery process, the type of anesthesia or analgesia used, and the complications identified. Postanesthesia pain management should be guided by protocols established by the anesthesiologists and obstetricians in concert. Blood pressure levels and pulse should be monitored at least every 15 minutes for 2 hours and more frequently and of longer duration if complications are encountered. The woman's temperature should be taken at least every 4 hours for 8 hours after delivery, then at least every 8 hours.

Nursing staff assigned to the delivery and immediate recovery of a woman should have no other obligations. Discharge from the delivery room, which may involve recovery from an anesthetic, should be at the discretion of the physician or certified nurse midwife or the anesthesiologist in charge.

When regional or general anesthesia has been used for either vaginal or cesarean delivery, the woman should be observed in an appropriately equipped LDR room or LDRP room or in an appropriately staffed and equipped postanesthesia care unit or equivalent area until she has recovered from the anesthetic. After cesarean delivery, policies for postanesthesia care should not differ from those applied to nonobstetric surgical patients receiving major anesthesia. Policy should ensure that a physician is available in the facility, or at least is nearby, to manage anesthetic complications and provide cardiopulmonary
resuscitation for patients in the postanesthesia care unit. The patient should be discharged from the recovery area only at the discretion of, and after communication between, the attending physician or a certified nurse midwife, anesthesiologist, or certified registered nurse anesthetist in charge. Vital signs and additional signs or events should be monitored and recorded as they occur.

**Postpartum Tubal Sterilization**

In evaluating the feasibility and safety or advisability of immediate postpartum sterilization, consideration must be given to the advent of maternal or neonatal problems and other demands on obstetric and anesthesia staff. If postpartum tubal ligation is planned, the vaginal delivery has been uncomplicated, and the anesthetic can be continued safely, there is no contraindication to proceeding directly to the sterilization procedure. Preoperative care and evaluation, therefore, become part of delivery room care, especially if the delivery has taken place in a room designed and equipped for abdominal surgery. The obstetrician and anesthesiologist or certified registered nurse anesthetist should exercise medical judgment regarding the risks, benefits, and safety of the procedure.

When a woman has had prior or concurrent psychologic difficulties, the risks and benefits of early postpartum sterilization must be carefully considered and alternative contraceptive options reviewed. In patients who have had medical or obstetric complications during their pregnancy or who have cardiovascular, respiratory, infectious, or metabolic abnormalities during the peripartum period (such as serious anemia, hypovolemia, upper respiratory infections, or hypertension), the procedure should be deferred unless there are overriding medical indications for proceeding. Major physiologic changes occur at delivery in all patients. In particular, cardiovascular stability of the patient should be ensured.

In addition to such maternal considerations, special attention also must be paid to situations in which neonatal outcome is in doubt. Both infant survival and long-term well-being may ultimately influence a decision with respect to desire for a subsequent pregnancy.

Furthermore, consideration of the overall number of patients in relationship to available staffing of the labor–delivery suite also is relevant. An elective procedure, such as tubal ligation, should not be attempted at a time when it might compromise other aspects of patient care. Therefore, the decision to proceed with anesthesia and surgery should not only be a joint one between anesthesiologist and obstetrician but also one that appropriately involves the patient and nursing and pediatric personnel.
Subsequent Postpartum Care

The medical and nursing staff should cooperatively establish specific postpartum policies and procedures. In the postpartum period, staff should help the woman learn how to care for the general needs of herself and her neonate and should identify potential problems related to her general health.

The obstetric caregiver should note postpartum orders on the patient’s medical record (see “ACOG Postpartum Form in Appendix A). If routine postpartum orders are used, they should be printed or written in the medical record, reviewed and modified as necessary for the particular patient, and signed by the obstetric caregiver before the patient is transferred to the postpartum unit. When an LDR or LDRP room is used, the same guidelines should apply.

Bed Rest, Ambulation, and Diet

It is important for the new mother to sleep, regain her strength, and recover from the effects of any analgesic or anesthetic agents that she may have received during labor. In the absence of complications, she may have a regular diet as soon as she wishes. Because early ambulation has been shown to decrease the incidence of subsequent thrombophlebitis, the mother should be encouraged to walk as soon as she feels able to do so. She should not attempt to get out of bed for the first time without assistance. She may shower as soon as she wishes. It may be necessary to administer fluids intravenously for hydration. If the patient has an intravenous line in place, her fluid and hemodynamic status should be evaluated before it is removed. If blood loss is greater than usual, the patient’s hematocrit also should be assessed before discontinuing intravenous access.

Care of the Vulva

Traditional teaching includes that the patient should be taught to cleanse the vulva from anterior vulva to perineum and anus rather than in the reverse direction. Application of an ice bag to the perineum during the first 24 hours after delivery may help reduce pain and swelling that have resulted from pressure of the neonate’s head. Orally administered analgesics often are required and usually are sufficient for relief of discomfort from episiotomy or repaired lacerations. Pain that is not relieved by such medication suggests hematoma formation and mandates a careful examination of the vulva, vagina, and rectum. Beginning 24 hours after delivery, moist heat in the form of a warm sitz bath may reduce local discomfort and promote healing.
Care of the Bladder
Women should be encouraged to void as soon as possible after delivery. Often women have difficulty voiding immediately after delivery, possibly because of trauma to the bladder during labor and delivery, regional anesthesia, or vulvar–perineal pain and swelling. In addition, the diuresis that often follows delivery can distend the bladder before the patient is aware of a sensation of a full bladder. To ensure adequate emptying of the bladder, the patient should be checked frequently during the first 24 hours after delivery, with particular attention to displacement of the uterine fundus and any indication of the presence of a fluid-filled bladder above the symphysis. Although every effort should be made to help the patient void spontaneously, catheterization may be necessary. If the patient continues to find voiding difficult, use of an indwelling catheter is preferable to repeated catheterization.

Care of the Breasts
The woman’s decision about breastfeeding determines the appropriate care of the breasts. Breast care for a woman who chooses to breastfeed is outlined in Chapter 7. The woman who chooses not to breastfeed should be reassured that milk production will abate over the first few days after delivery if she does not breastfeed. During the stage of engorgement, the breasts may become painful and should be supported with a well-fitting brassiere. Ice packs and analgesics can help relieve discomfort during this period. Medications for lactation cessation are discouraged. Women who do not wish to breastfeed should be encouraged to avoid nipple stimulation and should be cautioned against continued manual expression of milk.

Temperature Elevation
The condition of a postpartum patient with an elevated temperature (38°C or higher [100.4°F or higher] on two occasions, 6 hours apart) should be evaluated (see “Endometritis” in Chapter 6). The nursery should be notified if the mother develops a fever at any time during the postpartum period, especially after the first 24 hours. Under most circumstances, the neonate need not be separated from the woman for infection control (see “Endometritis” in Chapter 6).

Postpartum Analgesia
After vaginal delivery, analgesic medication (including topical lidocaine cream) may be necessary to relieve perineal and episiotomy pain and facilitate maternal mobility. This is best addressed by administering the drug on an as-needed
basis according to postpartum orders. Most mothers experience considerable pain in the first 24 hours after cesarean delivery. Although at one time pain most often was treated by intramuscular injections of narcotics, newer techniques, such as spinal or epidural opiates, patient-controlled epidural or intravenous analgesia, and potent oral analgesics provide better pain relief and greater patient satisfaction. Regardless of the route of administration, opioids potentially can cause respiratory depression and decrease intestinal motility. Therefore, adequate supervision and monitoring should be ensured for all postpartum patients receiving these drugs.

**Immunization—Anti-D Immune Globulin, Tetanus–Diphtheria Acellular Pertussis, and Rubella**

A woman who is unsensitized and D-negative and who gives birth to a neonate who is D-positive or Du-positive (ie, weak Rh positive) should receive 300 µg of anti-D immune globulin postpartum, ideally within 72 hours, even when anti-D immune globulin has been administered in the antepartum period. This dose may be inadequate in circumstances in which there is a potential for greater-than-average fetal-to-maternal hemorrhage, such as abruptio placentae, placenta previa, intrauterine manipulation, and manual removal of the placenta. In these cases, laboratory analysis should be performed to detect excessive maternal-to-fetal hemorrhage (eg, Kleihauer–Betke test) and determine the proper dose. If indicated, additional anti-D immune globulin should be given.

If a patient has not already received the tetanus–diphtheria acellular pertussis vaccine, and if it has been at least 2 years since her last tetanus–diphtheria booster, she should be given a dose before hospital discharge.

A patient who is identified as susceptible to rubella virus infection should receive the rubella vaccine in the postpartum period. The rubella vaccine can be administered before discharge, even if the patient is breastfeeding. Patients should be informed of the possibility of transient arthralgia and low-grade fever after rubella immunization.

**Length of Hospital Stay**

When no complications are present, the postpartum hospital stay ranges from 48 hours for vaginal delivery to 96 hours for cesarean delivery, excluding the day of delivery. When the physician and the mother want a shortened hospital stay, certain minimal criteria should be met:

- The mother is afebrile, with pulse and respirations of normal rate and quality.
• Her blood pressure level is within the normal range.
• The amount and color of lochia are appropriate for the duration of recovery.
• The uterine fundus is firm.
• Urinary output is adequate.
• Any surgical repair or wound has minimal edema and no evidence of infection and appears to be healing without complication.
• The mother is able to ambulate with ease and has adequate pain control.
• There are no abnormal physical or emotional findings.
• The mother is able to eat and drink without difficulty.
• Arrangements have been made for postpartum follow-up care.
• The mother has been instructed in caring for herself and the neonate at home, is aware of deviations from normal, and is prepared to recognize and respond to danger signs and symptoms.
• The mother demonstrates readiness to care for herself and her newborn.
• Pertinent laboratory results are available, including a postpartum measurement of hemoglobin or hematocrit, if indicated by excessive intrapartum or postpartum blood loss.
• ABO blood group and Rh D type are known, and, if indicated, the appropriate amount of anti-D immune globulin has been administered.
• The mother has received instructions on postpartum activity and exercises and common postpartum discomforts and relief measures.
• Family members or other support persons are available to the mother for the first few days following discharge.

The medical and nursing staff should be sensitive to potential problems associated with shortened hospital stays and should develop mechanisms to address patient questions that arise after discharge. With a shortened hospital stay, a home visit or follow-up telephone conference by a health care provider, such as a lactation nurse, within 48 hours of discharge is encouraged.

When a pregnancy, labor, or delivery is complicated by medical or obstetric disorders, the mother’s readiness for discharge may be based on the aforementioned criteria, as modified by the individual judgment of the obstetric care provider. The stability of the woman’s medical condition, the need for continued inpatient observation, and treatment and risks of complications should be taken into consideration.
Postpartum Nutritional Guidelines

Postnatal dietary guidelines are similar to those established during pregnancy (see Table 4-2 in Chapter 4). The minimal caloric requirement for adequate milk production in a woman of average size is 1,800 kcal per day. In general, an additional 500 kcal of energy daily is recommended throughout lactation. A balanced, nutritious diet will ensure both the quality and the quantity of the milk produced without depletion of maternal stores. Fluid intake by the mother is governed by thirst.

A vitamin–mineral supplement is not needed routinely. Mothers at nutritional risk should be given a multivitamin supplement with particular emphasis on calcium and vitamins B₁₂ and D. Iron should be administered only if the mother herself needs it.

Maternal postpartum weight loss can occur at a rate of 2 lb per month without affecting lactation. On average, a woman will retain 2 lb more than her prepregnancy weight at 1 year postpartum. There is no relationship between body mass index or total weight gain and weight retention. Aging, rather than parity, is the major determinant of increases in a woman’s weight over time.

Residual postpartum retention of weight gained during pregnancy that results in obesity is a concern. Special attention to lifestyle, including exercise and eating habits, will help these women return to a normal body mass index.

Postpartum Considerations

Before discharge, the mother should receive information about the following normal postpartum events:

- Changes in lochia pattern expected in the first few weeks
- Range of activities that she may reasonably undertake
- Care of the breasts, perineum, and bladder
- Dietary needs, particularly if she is breastfeeding
- Recommended amount of exercise
- Emotional responses
- Signs of complications (eg, temperature elevation, chills, leg pains, episiotomy or wound drainage, or increased vaginal bleeding)

The length of convalescence that the patient can expect, based on the type of delivery, also should be discussed. For women who have had cesarean delivery, additional precautions may be appropriate, such as wound care and temporary
abstinence from lifting objects heavier than the newborn and from driving motor
vehicles. It is helpful to reinforce oral discussions with written information.

The earliest time at which coitus may be resumed safely after childbirth is
unknown. Resumption of coitus should be discussed with the couple. Risks of
hemorrhage and infection are minimal approximately by 2 weeks postpartum.
By this time, the uterus has involuted markedly and the endometrium and
cervix have begun to reepithelialize. Thereafter, coitus can be resumed, depend-
ing on the patient's desire and comfort and on resolution of contraceptive
issues.

Sexual difficulties that are common in the early months after childbirth
should be discussed. Healing at the episiotomy site can cause the woman some
discomfort during intercourse within the first year following delivery. In the
lactating woman, the vagina often is atrophic and dry. Natural lubrication dur-
ing sexual excitement may be unsatisfactory. Furthermore, the demands of the
newborn's care alter the couple's ability to find time for physical intimacy.

Methods of contraception should be fully reviewed and implemented. In
women who breastfeed exclusively, a return to fertility is delayed. When care-
fully defined criteria are met (see ACOG/AAP Breastfeeding Handbook for
Physicians), the Lactational Amenorrhea Method can be used as a reliable form
of contraception temporarily. Nonnursing mothers should begin using a con-
traceptive soon after delivery if they wish to avoid becoming pregnant.
Combined oral contraceptives may be prescribed if there is no personal or fam-
ily history of venous thrombosis and no known significant thrombophilia is
present. Nonnursing women may receive depot medroxyprogesterone acetate
within 5 days after delivery.

Progesterone-only contraceptives do not appear to have adverse effects on
lactation. Women may consider initiating progesterone-only contraceptives at
6 weeks if breastfeeding exclusively, at 3 weeks if not exclusively. However, in
certain situations, such as concern about patient follow-up, an earlier start may
be appropriate. An intrauterine device that contains copper also is an option
that does not interfere with breast milk. However, intrauterine devices gener-
ally are not inserted until 4–6 weeks postpartum. While progestin-only prepa-
rations remain the oral contraception of choice for breastfeeding women, they
may begin using oral combined estrogen–progestin contraceptives at 6 weeks
after delivery if breastfeeding is well established and the infant's nutritional sta-

us is monitored. If follow-up concerns are strong enough to consider an ear-
lier start, that should be only after the period of hypercoagulability associated
with pregnancy has resolved (ie, 2–4 weeks).
Patients for whom the use of oral contraceptives is contraindicated or who prefer other methods of contraception, such as foam or condoms, should be offered instruction in their use. Spermicides and barrier methods have no effect on breastfeeding. Lubricated condoms may offset vaginal dryness secondary to breastfeeding. A diaphragm or a cervical cap cannot be fitted adequately during the immediate postpartum period and should be delayed until the 4- to 6-week examination. Fertility awareness methods, such as the rhythm method, are difficult to practice accurately before the resumption of menses and, therefore, are not recommended.

At the time of discharge, the family should be given the name of the person to contact if questions or problems arise for either the mother or the newborn. Arrangements should be made for a follow-up examination and specific instructions conveyed to the woman, including when contact is advisable.

In general, the following points should be reviewed with the mother or, preferably, with both parents; specific information to be conveyed is discussed within this section:

- Condition of the newborn
- Immediate needs of the newborn (eg, feeding methods and environmental supports)
- Feeding techniques; skin care, including umbilical cord care; temperature assessment and measurement with a thermometer; and assessment of neonatal well-being and recognition of illness
- Roles of the obstetrician, pediatrician, and other members of the health care team concerned with the continuous medical care of the mother and the newborn
- Availability of support systems, including psychosocial support
- Instructions to follow in the event of a complication or emergency
- Importance of maintaining newborn immunization, beginning with an initial dose of hepatitis B virus vaccine. (For more information, see “Discharge” in Chapter 7.)

**Follow-up Care**

The physical and psychosocial status of the mother and the newborn should be subject to ongoing assessment after discharge. The new mother needs personalized care during the postpartum period to hasten the development of a healthy
mother–infant relationship and a sense of maternal confidence. Support and reassurance should be provided as the woman masters newborn-care tasks and adapts to her maternal role. Involving the father and encouraging him to participate in the newborn’s care not only can provide additional support to the woman but also can enhance the father–infant relationship.

For many women, the postpartum period can be a stressful time and may lead to the onset of mood disorders. Some patients experience postpartum “blues,” which normally occur within 2–4 days postpartum. The patient’s mood usually is labile, and she may feel happy or excited, only to be sad, depressed, anxious, and irritable hours later. Symptoms generally are mild and self-limited. Supportive care and reassurance are helpful in ensuring that symptoms are time-limited. However, all women with postpartum blues should be monitored for the onset of continuing or worsening symptoms because women with the blues are at high risk for the onset of a more serious condition (see also “Psychosocial Services” in Chapter 4). The incidence of postpartum major or minor depressive disorders varies from 10% to 15%, and treatment with an antidepressant drug generally is recommended for a major depressive disorder. It should be noted that recurrent depression might occur following discontinuation of psychotropic medication. Postpartum psychosis is the most severe form of mental derangement and is most common in women with preexisting disorders, such as manic–depressive illness or, less commonly, schizophrenia. Women with postpartum psychosis show severe symptoms, such as an inability to sleep and strange notions about their neonate as well as other significant individuals in their lives. This should be considered a psychiatric emergency and the patient should be referred for immediate, often inpatient, treatment.

The postpartum period is a time of developmental adjustment for the whole family. Family members have new roles and relationships, and an effort should be made to assess the progress of the family’s adaptation. If a family member—parent or sibling—finds it difficult to assume the new role, the health care team should arrange for sensitive, supportive assistance. This is particularly important for adolescent mothers, for whom it may be necessary to mobilize multiple resources within the community.

**Postpartum Visits**

Approximately 4–6 weeks after delivery, the mother should visit her physician for a postpartum review and examination (see Appendix G). This interval may be modified according to the needs of the patient with medical, obstetric, or
intercurrent complications. A visit within 7–14 days of delivery may be advisable after a cesarean delivery or a complicated gestation, such as a patient requiring antihypertensives for after-treatment of severe preeclampsia or severe hypertension.

The review at the first postpartum visit should include obtaining an interval history and performing a physical examination to evaluate the patient’s current status and her adaptation to the newborn. Specific inquiries regarding breastfeeding should be made. The examination should include an evaluation of weight, blood pressure levels, breasts (if not lactating or if there are specific complaints in lactating women), and abdomen as well as a pelvic examination. Episiotomy repair and uterine involution should be evaluated and a Pap test performed, if needed. Methods of birth control should be reviewed or initiated.

As noted above, many women experience some degree of emotional lability in the postpartum period. If this persists or develops into clinically significant depression, intervention may be needed. The emotional status of a woman whose pregnancy had an abnormal outcome also should be reviewed. Counseling should address specific issues regarding her future health and pregnancies. For example, it may be advantageous to discuss VBAC or the implications of diabetes mellitus, intrauterine growth restriction, preterm birth, hypertension, fetal anomalies, or other conditions that may recur in any future pregnancy. Laboratory data should be obtained as indicated. This is a good time to review immunizations, including rubella vaccination for women who are susceptible and did not receive the vaccine immediately postpartum, and to discuss any special problems. The patient should be encouraged to return for subsequent periodic examinations.

The postpartum visit is an excellent time to begin preconception counseling for patients who may wish to have future pregnancies (see also “Preconception Care” in Chapter 4). This counseling includes risk assessment to facilitate the planning, spacing, and timing of the next pregnancy; health promotion measures; and timely intervention to reduce medical and psychosocial risks. Such intervention may include treatment of infections; counseling regarding behaviors, such as those related to sexually transmitted infections; nutrition counseling and supplementation; and appropriate referrals for follow-up care. Although physiologic considerations indicate that a woman can return to a normal work schedule 4–6 weeks after delivery, attention also should be given to maternal–infant bonding.
Resources


Guidelines for Perinatal Care was developed through the cooperative efforts of the American Academy of Pediatrics (AAP) Committee on Fetus and Newborn and the American College of Obstetricians and Gynecologists (ACOG) Committee on Obstetric Practice. The guidelines should not be viewed as a body of rigid rules. They are general and intended to be adapted to many different situations, taking into account the needs and resources particular to the locality, the institution, or the type of practice. Variations and innovations that improve the quality of patient care are to be encouraged rather than restricted. The purpose of these guidelines will be well served if they provide a firm basis on which local norms may be built.

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American Academy of Pediatrics
141 Northwest Point Boulevard
PO Box 927
Elk Grove Village, IL 60009-0927

The American College of Obstetricians and Gynecologists
409 12th Street, SW
PO Box 96920
Washington, DC 20090-69020

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