**Chapter 24**

**Labor and Birth at Risk**

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**LEARNING OBJECTIVES**

- Differentiate between preterm birth and low birth weight.
- Identify the risk factors for preterm labor.
- Evaluate current interventions to prevent preterm birth.
- Discuss the use of tocolytics and antenatal glucocorticoids in preterm labor and birth.
- Examine the effects of prescribed bed rest on pregnant women and their families.
- Summarize the nursing care management of women with preterm premature rupture of membranes.
- Demonstrate knowledge of nursing management for a trial of labor, the induction and augmentation of labor, forceps- and vacuum-assisted birth, cesarean birth, and vaginal birth after a cesarean birth.
- Explain the care of a woman with postterm pregnancy.
- Discuss obstetric emergencies and their appropriate management.

**KEY TERMS AND DEFINITIONS**

- **amniotic fluid embolism (AFE)**: Embolism resulting from amniotic fluid entering the maternal bloodstream during labor and birth after rupture of membranes; often fatal to the woman if it is a pulmonary embolism.
- **antenatal glucocorticoids**: Medications administered to the mother for the purpose of accelerating fetal lung maturity when there is increased risk for preterm birth between 24 and 34 weeks of gestation.
- **augmentation of labor**: Stimulation of ineffective uterine contractions after labor has started spontaneously but is not progressing satisfactorily.
- **Bishop score**: Rating system to evaluate inducibility (ripeness) of the cervix; a higher score increases the likelihood of a successful induction of labor.
- **cephalopelvic disproportion (CPD)**: Condition in which the infant’s head is of such a shape, size, or position that it cannot pass through the mother’s pelvis or the maternal pelvis is too small, abnormally shaped, or deformed to allow the passage of a fetus of average size.
- **cesarean birth**: Birth of a fetus by an incision through the abdominal wall and uterus.
- **chorioamnionitis**: Inflammatory reaction in fetal membranes to bacteria or viruses in the amniotic fluid, which then become infiltrated with polymorphonuclear leukocytes.
- **dysfunctional labor**: Abnormal uterine contractions that prevent normal progress of cervical dilation, effacement, or descent.
- **dystocia**: Prolonged, painful, or otherwise difficult labor caused by various conditions associated with the five factors affecting labor (powers, passage, passenger, maternal position, and maternal emotions).
- **external cephalic version (ECV)**: Turning of the fetus to a vertex presentation by external exertion of pressure on the fetus through the maternal abdomen.
- **forceps-assisted birth**: Vaginal birth in which forceps (i.e., curved-bladed instruments) are used to assist in the birth of the fetal head.
- **hypertonic uterine dysfunction**: Uncoordinated, painful, frequent uterine contractions that do not cause cervical dilation and effacement; primary dysfunctional labor.
- **hypotonic uterine dysfunction**: Weak, ineffective uterine contractions usually occurring in the active phase of labor; often related to cephalopelvic disproportion or malposition of the fetus; secondary uterine inertia.
- **oxytocin**: Hormone produced by the posterior pituitary gland that stimulates uterine contractions and the release of milk in the mammary glands (let-down reflex); synthetic oxytocin is a medication that mimics the uterine stimulating action of oxytocin.
- **postterm pregnancy**: Pregnancy prolonged past 42 weeks of gestation.

**Continued**
diatrics [AAP], 2002). Preterm labor and birth are the most urgent obstetric emergencies. This chapter focuses on the problems of preterm labor and birth, dystocia, and postterm pregnancy and obstetric emergencies.

PRETERM LABOR AND BIRTH

Preterm labor is defined as cervical changes and uterine contractions occurring between 20 and 37 weeks of pregnancy. Preterm birth is any birth that occurs before the completion of 37 weeks of pregnancy. Some complications are anticipated, especially if the mother is identified as high risk during the antepartum period; others are unexpected or unforeseen. The woman, her family, and the obstetric team can feel devastated when things go wrong. Nurses must recognize these feelings if they are to provide effective support. It is crucial for nurses to understand the normal birth process and to implement nursing measures when complications arise. Optimal care of the laboring woman, fetus, and family experiencing complications is possible only when the nurse and other members of the obstetric team use their knowledge and skills in a concerted effort to provide care. This chapter focuses on the problems of preterm labor and birth, dystocia, and postterm pregnancy and obstetric emergencies.

PRETERM LABOR AND BIRTH—cont’d

Therapeutic rest Administration of analgesics and implementation of comfort or relaxation measures to decrease pain and induce rest for management of hypertonic uterine dysfunction tocolytics Medications used to suppress uterine activity and relax the uterus in cases of hyperstimulation or preterm labor trial of labor (TOL) Period of observation to determine whether a laboring woman is likely to be successful in progressing to a vaginal birth vacuum-assisted birth Birth involving attachment of a vacuum cap to the fetal head (occiput) and application of negative pressure to assist in birth of the fetus vaginal birth after cesarean (VBAC) Giving birth vaginally after having had a previous cesarean birth

serious complications of pregnancy because they lead to about 90% of all neonatal deaths, with more than 75% of these deaths occurring in infants born at fewer than 32 weeks of gestation. Preterm birth is second only to congenital anomalies as a cause of infant mortality. In 2003 the preterm birth rate for all races in the United States was 12.3% (Hamilton, Martin, Sutton, & Centers for Disease Control and Prevention [CDC], National Center for Health Statistics, 2004).

Preterm Birth versus Low Birth Weight

Although they have distinctly different meanings, the terms premature birth or prematurity and low birth weight are often used interchangeably (Moos, 2004). Preterm birth describes length of gestation (i.e., less than 37 weeks regardless of the weight of the infant), whereas low birth weight describes only weight at the time of birth (i.e., 2500 g or less). Low birth weight is far easier to measure than preterm birth, and therefore in many settings and publications, low birth weight has been used as a substitute term for preterm birth. Preterm birth, however, is a more dangerous health condition for an infant because a decreased length of time in the uterus correlates with immaturity of body systems. Low-birth-weight babies can be, but are not necessarily, preterm; low birth weight can be caused by conditions other than preterm birth, such as intrauterine growth restriction (IUGR), a condition of inadequate fetal growth not necessarily correlated with initiation of labor.
The incidence of preterm birth in the United States is increasing and varies according to race; the 2002 rate for African-Americans (17.7%) was considerably higher than that for American Indians (13.1%), Hispanics (11.4%), Caucasians (11%), and Asians and Pacific Islanders (10.4%) (Martin et al., 2003). The increase in rates is attributed largely to the increase in multiple births. Sociodemographics may play a part in the race-based differences in preterm birth. Preterm birth rates are higher among socially disadvantaged populations, including minorities, women with low levels of education, and women who receive late or no prenatal care (Martin et al., 2003; Massin et al., 2004). The preterm birth rate is higher among women younger than 15 years of age or older than 45 years (Martin et al., 2003). Multifetal pregnancy from in vitro fertilization also is associated with an increase in preterm births (Moore, 2003).

**Predicting Preterm Labor and Birth**

The known risk factors for preterm birth are shown in Box 24-1. The risk factors most commonly associated with preterm labor and birth are a history of preterm birth, race (e.g., African-American), and multiple gestation (Martin et al., 2003). Using these risk factors, researchers have tried to determine which women might go into labor prematurely. No risk scoring system has resulted in lowering the preterm birth rate in the United States, however, because at least 50% of all women who ultimately give birth prematurely have no identifiable risk factors (Martin et al., 2003). The March of Dimes has started a 5-year, $75 million campaign to address the problem of prematurity. The Association of Women’s Health, Obstetric and Neonatal Nurses (AWHONN) is a partner in this project. AWHONN is helping to increase screening for known risk factors and to teach women the signs and symptoms of preterm labor (Nelson, 2004). It is important that all women be educated about prematurity not only in early pregnancy but also in the preconception period (Freda & Patterson, 2001; Massett et al., 2003).

**Biochemical markers**

The two most common biochemical markers used in an effort to predict who might experience preterm labor are fetal fibronectin and salivary estriol (Goldenberg et al., 2003). Fetal fibronectins are glycoproteins found in plasma and produced during fetal life. They appear in the cervical canal early in pregnancy and then again in late pregnancy. Their appearance between 24 and 34 weeks of gestation predicts labor (Bernhardt & Dorman, 2004; Ramsey & Andrews, 2003). The negative predictive value of fetal fibronectin is high (up to 94%). The positive predictive value is lower (44%) (Gams & Creasy, 2004). This means that it may be possible to predict who will go into preterm labor, but not who will (Bernhardt & Dorman, 2004). The test is done during a vaginal examination.

Salivary estriol is a form of estrogen produced by the fetus that is present in plasma at 9 weeks of gestation. Levels of salivary estriol have been shown to increase before preterm birth. Specimens of salivary estriol are collected by the woman in the home. The testing is done every 2 weeks for about 10 weeks. This marker also has a high negative predictive value (98%) and a lower positive predictive value (7% to 25%) (Bernhardt & Dorman, 2004).

**Risk Factors for Preterm Labor**

**BOX 24-1**

**Risk Factors for Preterm Labor**

<table>
<thead>
<tr>
<th>BOX 24-1</th>
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<tbody>
<tr>
<td><strong>DEMOGRAPHIC RISKS</strong></td>
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<tr>
<td>• Nonwhite race</td>
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<tr>
<td>• Age (&lt;15 years, &gt;45)</td>
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<tr>
<td>• Low socioeconomic status</td>
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<tr>
<td>• Unmarried</td>
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<tr>
<td>• Less than high school education</td>
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<tr>
<td><strong>BIOPHYSICAL RISKS</strong></td>
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<tr>
<td>• Previous preterm labor or birth</td>
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<tr>
<td>• Second-trimester abortion (more than two spontaneous or therapeutic; stillbirths)</td>
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<tr>
<td>• Grand multiparity; short interval between pregnancies, ≤1 year since last birth; history of preterm labor and birth</td>
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<tr>
<td>• Progesterone deficiency</td>
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<tr>
<td>• Uterine anomalies or fibroids; uterine irritability</td>
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<tr>
<td>• Cervical incompetence, trauma, shortened length</td>
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<tr>
<td>• Exposure to DES or other toxic substances</td>
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<tr>
<td>• Medical diseases (e.g., diabetes, hypertension, anemia)</td>
</tr>
<tr>
<td>• Small stature (&lt;119 cm in height; &lt;45.5 kg or underweight for height)</td>
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<tr>
<td><strong>Current pregnancy risks:</strong></td>
</tr>
<tr>
<td>• Multifetal pregnancy</td>
</tr>
<tr>
<td>• Hydramnios</td>
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<td>• Bleeding</td>
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<tr>
<td>• Placental problems (e.g., placenta previa, abruptio placenta)</td>
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<tr>
<td>• Infections (e.g., pyelonephritis, recurrent urinary tract infections, asymptomatic bacteriuria, bacterial vaginosis, chorioamnionitis)</td>
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<tr>
<td>• Gestational hypertension</td>
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<tr>
<td>• Premature rupture of the membranes</td>
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<tr>
<td>• Fetal anomalies</td>
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<tr>
<td>• Inadequate plasma volume expansion; anemia</td>
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<tr>
<td><strong>BEHAVIORAL-PSYCHOSOCIAL RISKS</strong></td>
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<tr>
<td>• Poor nutrition; weight loss or low weight gain</td>
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<td>• Smoking (&gt;10 cigarettes a day)</td>
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<tr>
<td>• Substance abuse (e.g., alcohol; illicit drugs, especially cocaine)</td>
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<tr>
<td>• Inadequate prenatal care</td>
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<tr>
<td>• Commutes of more than 1½ hours each way</td>
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<tr>
<td>• Excessive physical activity (heavy physical work, prolonged standing, heavy lifting, care of young child)</td>
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<tr>
<td>• Excessive lifestyle stressors</td>
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</table>

More research is needed before it will be known if these markers offer valuable assistance that is cost effective in the risk assessment for preterm labor.

**Endocervical length**

Another possible predictor of imminent preterm labor is endocervical length. Some studies have suggested that a shortened cervix precedes preterm labor and can be determined by ultrasound measurement (Bernhardt & Dorman, 2004; Fuchs, Henrich, Osthues, & Dudenhausen, 2004). Women whose cervical length is 35 mm at 24 to 28 weeks of gestation are more likely to have a preterm birth than women whose cervical length exceeds 40 mm. When a woman has a short cervix combined with a positive fetal fibronectin result, her risk for spontaneous preterm birth is substantially higher than that for women positive for only one marker or none at all (Iams & Creasy, 2004).

**Causes of preterm labor and birth**

The cause of preterm labor is unknown and is assumed to be multifactorial. Infection is thought to be a major etiologic factor in some preterm labors, but trials of antibiotic therapy for all women at risk have not resulted in statistically significant reductions in preterm births (Iams & Creasy, 2004). When cervical, bacterial, or urinary tract infections are present, the risk of preterm birth is increased; therefore early, continuous, and comprehensive prenatal care, which can detect and treat infection, is essential in dealing with this aspect of preterm birth prevention.

Not all preterm births can or even should be prevented. About 25% of all preterm births are iatrogenic, that is, babies are intentionally delivered prematurely because of pregnancy complications that put the life or health of the fetus or mother in danger, not because of preterm labor. Another 25% of all preterm births are preceded by spontaneous rupture of the membranes (preterm premature rupture of the membranes) followed by labor. These preterm births are not known to be preventable. About 50% of preterm births, therefore, are possibly amenable to prevention efforts and are considered idiopathic preterm births (Iams & Creasy, 2004).

Sociodemographic factors such as poverty, low educational level, lack of social support, smoking, little or no prenatal care, domestic violence, and stress are thought to contribute to the 50% of preterm births that may be preventable (Gennaro & Hennessy, 2003; Iams & Creasy, 2004). If prenatal care programs are to be effective in reducing the rate of preterm labor and birth, they must address these sociodemographic factors and develop strategies to attract all women to participate, including those at high risk for preterm labor (Maloni, 2000).

**Critical Thinking Exercise**

Preterm Labor

You are assigned to Yolanda, who is experiencing preterm labor at 28 weeks of gestation. She has a 2-year-old son at home. This is her third admission for preterm labor during this pregnancy. Her primary health care provider has told her she must remain hospitalized on bed rest until she reaches 37 weeks of gestation or until birth of the baby, whichever comes first. She tearfully asks you why she can’t be at home on bed rest, who will help care for her son, and how she will manage to keep from going crazy staying in bed that long. How will you respond to her concerns?

1. Is there sufficient evidence to draw conclusions about the benefits of bed rest to prevent preterm birth?
2. What assumptions can be made about the following issues?
   a. The impact her history might have on the medical and nursing care she receives during this pregnancy.
   b. The pros and cons of home management versus hospital management for the prevention of preterm birth for this woman.
   c. Ways to reduce the frustration and boredom that are experienced during restriction to bed rest for several weeks.
   d. Resources available to assist with care of her 2-year-old son.
3. What implications and priorities for nursing care can be drawn at this time?
4. Does the evidence objectively support your conclusion?
5. Are there alternative perspectives to your conclusion?
if the symptoms subside, go away, or become worse. Some women may take action by seeking advice about what to do from family or friends, resting more, increasing fluid intake, taking a bath, or rubbing the back or abdomen. Persistence of symptoms and increasing severity finally compel women to seek health care (Weiss, Saks, & Harris, 2002). Waiting too long to see a health care provider could result in inevitable preterm birth without the benefit of the administration of antenatal glucocorticoids (i.e., medication given to accelerate fetal lung maturity). In this event, the neonate is born at higher risk for respiratory distress syndrome and intraventricular hemorrhage.

The nurse must assess the psychosocial and emotional status of women in preterm labor and the impact that treatment (e.g., bed rest, hospitalization) can have on family dynamics. Factors influencing the impact of preterm labor treatment include stability of the support system, financial status, and availability of child support and assistance with household maintenance. Pregnant women who have risk factors for preterm birth are often offered special care with more frequent visits. Although there is no evidence in the literature that this enhanced care results in better outcomes, clinically it makes sense to evaluate at-risk women on a more frequent basis. Freda and Patterson (2001) suggest that the power of nursing care, nursing support, and patient education in the care of women at high risk for preterm birth can affect the occurrence and early detection of preterm labor. Nursing diagnoses relevant for women at risk for preterm labor include the following:

- **Risk for maternal excess fluid volume related to** —administration of tocolytics to suppress preterm labor

### BOX 24-2
#### Signs and Symptoms of Preterm Labor

<table>
<thead>
<tr>
<th>UTERINE ACTIVITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uterine contractions more frequent than every 10 minutes persisting for 1 hour or more</td>
</tr>
<tr>
<td>Uterine contractions may be painful or painless</td>
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<tr>
<th>DISCOMFORT</th>
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<tbody>
<tr>
<td>Lower abdominal cramping similar to gas pains; may be accompanied by diarrhea</td>
</tr>
<tr>
<td>Dull, intermittent low back pain (below the waist)</td>
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<tr>
<td>Painful, menstrual-like cramps</td>
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<tr>
<td>Suprapubic pain or pressure</td>
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<tr>
<td>Pelvic pressure or heaviness</td>
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<tr>
<td>Urinary frequency</td>
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</tbody>
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<table>
<thead>
<tr>
<th>VAGINAL DISCHARGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in character and amount of usual discharge: colorless; increased amount; odor</td>
</tr>
<tr>
<td>Change in character and amount of usual discharge: thicker (mucoid) or thinner (watery); bloody, brown, or colorless; increased amount; odor</td>
</tr>
<tr>
<td>Rupture of amniotic membranes</td>
</tr>
</tbody>
</table>

**Expected Outcomes of Care**

Expected outcomes include that the woman will do the following:

- Learn the signs and symptoms of preterm labor and be able to assess herself and her need for intervention
- Follow teaching suggestions and call her primary health care provider if symptoms occur
- Not experience preterm symptoms, or, if she does, she will take appropriate action
- Maintain her pregnancy for at least 37 completed weeks
- Give birth to a healthy, full-term infant

### Plan of Care and Interventions

**Prevention**

Prevention strategies that address risk factors associated with preterm labor and birth are less costly in human and financial terms than the high-tech and often lifelong care required by preterm infants and their families. Programs aimed at health promotion and disease prevention that encourage healthy lifestyles for the population in general and women of childbearing age in particular should be developed to prevent preterm labor and birth (Freda, 2003; Heaman, Sprague, & Stewart, 2001; Tiedje, 2003). One of the most important nursing interventions aimed at preventing preterm birth is the education of pregnant women about the early symptoms of preterm labor, so that if symptoms occur the woman can be referred promptly to her care provider for more intensive care (Freda, 2003; Moore, 2003). Box 24-2 identifies the symptoms of preterm labor, and the Guidelines/Guías box identifies what the woman should do if the symptoms appear. Patient education regarding any symptoms of contractions or cramping between 20 and 37 weeks of gestation should be directed toward telling the woman that these symptoms are not normal discomforts of pregnancy, and that contractions or cramping that do not go away should prompt the woman to contact her primary health care provider. Because no one can discriminate between Braxton Hicks contractions and the contractions of early preterm labor, Freda and Patterson (2001) suggest that the term Braxton Hicks contractions be eliminated from teaching about pregnancy expectations (Fig. 24-1).

**Early recognition and diagnosis**

Early recognition of preterm labor is essential to successfully implement interventions such as tocolytic therapy and
administration of antenatal glucocorticoids. The diagnosis of preterm labor is based on three major diagnostic criteria:

- Gestational age between 20 and 37 weeks
- Uterine activity (e.g., contractions)
- Progressive cervical change (e.g., effacement of 80% or cervical dilation of 2 cm or greater)

If the presence of fetal fibronectin is used as another diagnostic criterion, a sample of cervical mucus for testing should be obtained before an examination for cervical changes, because the lubricant used to examine the cervix can reduce the accuracy of the test for fetal fibronectin.

The pregnant woman at 30 weeks with an irritable uterus but no documented cervical change is not in preterm labor. Misdiagnosis of preterm labor can lead to inappropriate use of pharmacologic agents that can be dangerous to the health of the woman, the fetus, or both (Abrahams & Katz, 2002; ACOG/AAP, 2002).

Lifestyle modifications
Nurses caring for women with symptoms of preterm labor should question the woman about whether she has symptoms when engaged in any of the following activities:

- Sexual activity
- Riding long distances in automobiles, trains, or buses
- Carrying heavy loads such as laundry, groceries, or a small child
- Standing more than 50% of the time
- Heavy housework
- Climbing stairs
- Hard physical work
- Being unable to stop and rest when tired

If symptoms occur when the woman is engaged in any of these activities, the woman should consider stopping those activities until 37 weeks of pregnancy when preterm birth is no longer a risk. Counseling about lifestyle modification should be individualized; only women who have symptoms of preterm labor when they are engaged in certain activities need to alter their lifestyles. No specific rules describe which activities are safe for pregnant women and which are not. Each pregnant woman must understand which lifestyle factors might be contributing to her symptoms and be taught to modify only those factors. Sexual activity, for instance, is not contraindicated during pregnancy.

Bed rest
Bed rest is a commonly used intervention for the prevention of preterm birth. Although frequently prescribed, bed rest is not a benign intervention, and there is no evi-
Adverse Effects of Bed Rest

are told that it would be best if they were at home on bed rest (Zarchin, 2002; Maloni & Kutil, 2000). Bed rest has been found to be highly therapeutic (Adler & Zarchin, 2002; Maloni, Brezinski-Tomasii, & Johnson, 2001). Prolongation of pregnancy does not necessarily occur despite the increased costs incurred. Women on bed rest need support and encouragement whether they are at home or are hospitalized. Nurses can create support groups of hospitalized women on bed rest. Internet resources including chat rooms for women on bed rest at home, as well as families, who are often anxious regarding the health status of the mother and baby, may need help in learning how to organize time and space or to restructure family routines so that the pregnant woman can remain a part of family activity while still maintaining bed rest. It also is important for the nurse to work toward assisting all the family members to explore their feelings regarding the anxieties of preterm labor and help them to share their feelings with one another (Maloni, Brezinski-Tomasii & Johnson, 2001). Box 24-4 and the Patient Instructions for Self-Care Box list activities for women on bed rest and for their children.

The woman’s environment can be modified for convenience by using tables and storage units around her bed to keep essential items within reach (e.g., telephone, television, radio, tape or compact disc player, computer with Internet access, snacks, books, magazines, and newspapers, items for hobbies) (Fig. 24-2). Ensuring that the bed or couch is ideal). Women often find that a daily schedule of meals, activities, and hygiene and grooming (e.g., shower, dressing in street clothes, applying make-up) that they create reduces boredom and helps them maintain control and normalcy.

Home care

Women who are at high risk for preterm birth commonly are told that it would be best if they were at home on bed rest for weeks or months. The home care of the woman at risk for preterm birth is a challenge for the nurse, who must assist the woman and her family in dealing with the many difficulties faced by families in which one member is incapacitated. The scope of care given to women in their homes ranges from occasional visits to monitor the maternal and fetal condition, to daily telephone consultation and reading of uterine monitoring strips.

Regardless of the frequency of the visits, nursing care for the woman and family in the home demands organization and a sense of just how this family’s life has been disrupted by the loss of activity of this essential family member. Families, who are often anxious regarding the health status of the mother and baby, may need help in learning how to organize time and space or to restructure family routines so that the pregnant woman can remain a part of family activity while still maintaining bed rest. It also is important for the nurse to work toward assisting all the family members to explore their feelings regarding the anxieties of preterm labor and help them to share their feelings with one another (Maloni, Brezinski-Tomasii & Johnson, 2001). Box 24-4 and the Patient Instructions for Self-Care Box list activities for women on bed rest and for their children.

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**BOX 24-3**

### Adverse Effects of Bed Rest

#### MATERNAL EFFECTS (PHYSICAL)
- Weight loss
- Muscle wasting, weakness
- Bone demineralization and calcium loss
- Decreased plasma volume and cardiac output
- Increased clotting tendency; risk for thrombophlebitis
- Alteration in bowel function
- Sleep disturbance, fatigue
- Prolonged postpartum recovery

#### MATERNAL EFFECTS (PSYCHOSOCIAL)
- Loss of control associated with role reversals
- Dysphoria-anxiety, depression, hostility, and anger
- Guilt associated with difficulty complying with activity restriction and inability to meet role responsibilities
- Boredom, loneliness
- Emotional lability (mood swings)

#### EFFECTS ON SUPPORT SYSTEM
- Stress associated with role reversals, increased responsibilities, and disruption of family routines
- Financial strain associated with loss of maternal income and cost of treatment
- Fear and anxiety regarding the well-being of the mother and fetus

**BOX 24-4**

### Activities for Children of Women on Bed Rest

- Schedule brief play periods throughout the day.
- Keep a few favorite toys in a box or basket close to the bed or couch.
- Read to the child(ren).
- Put puzzles together.
- Watch videos, play video games (remote control for TV is ideal).
- Play cards or board games.
- Color in coloring books.
- Cut out pictures from magazines and paste on cardboard.
- Play bed basketball with a soft (sponge) ball or rolled up sock and a trash can or empty laundry basket.

PATIENT INSTRUCTIONS FOR SELF-CARE

Suggested Activities for Women on Bed Rest

- Set a routine for daily activities (e.g., getting dressed, moving from the bedroom to a “day bed-rest place,” having social time, eating meals, self-monitoring fetal and uterine activity).
- Do passive exercises as allowed.
- Review childbirth education information or have a childbirth class at home, if this can be arranged.
- Plan meals and make up grocery shopping lists.
- Shop by phone.
- Read books about high risk pregnancy or other topics.
- Keep a journal of the pregnancy.
- Do crossword puzzles, jigsaw puzzles, etc.
- Shop by phone.
- Do mending, sewing.
- Call a friend, family member, or support person each day or use email.
- Treat yourself to a facial, manicure, neck massage, or other special treat when you need a lift.
- Review childbirth education information or have a childbirth class at home, if this can be arranged.
- Plan meals and make up grocery shopping lists.
- Shop by phone.
- Read books about high risk pregnancy or other topics.
- Keep a journal of the pregnancy.
- Do crossword puzzles, jigsaw puzzles, etc.
- Do craft projects; make something for the baby.
- Put pictures in photo albums.
- Review childbirth education information or have a childbirth class at home, if this can be arranged.
- Plan meals and make up grocery shopping lists.


Limiting naps, eating smaller but more frequent meals, and performing gentle range-of-motion exercises can help to reduce some of the detrimental effects of bed rest. It is essential that women and their families recognize that postpartum recovery will be slower as she works to regain strength and stamina (Maloni, 2002).

Home uterine activity monitoring

Home uterine monitoring systems were developed to provide home uterine monitoring services for women diagnosed with preterm labor. Nurses are usually an integral part of the home uterine activity monitoring (HUAM) systems to educate and provide care to the women. The use and effectiveness of HUAM continues to be controversial. Enkin and colleagues (2000) found HUAM a form of care unlikely to be beneficial in preventing preterm birth. However, a comprehensive evidence-based review of clinical data suggests that if used correctly (e.g., twice daily monitoring of uterine activity and daily nursing care) in women at risk for preterm birth, HUAM increases the incidence of early diagnosis of preterm labor, prolongation of pregnancy with fewer preterm births, and reduced neonatal morbidity when study groups are compared with control groups of women receiving standard prenatal care in the United States (Morrison & Chauhan, 2003). Research should be continued in this area to determine what place HUAM has in preterm labor care.

Suppression of uterine activity

Tocolytics. Should preterm labor occur, women are usually admitted to the hospital for assessment; fetal monitoring; cervical or vaginal cultures; assessment of cervical status, amniotic fluid leakage, and elevated maternal temperature (an early sign of chorioamnionitis). The initiation of tocolytic therapy might be considered at this time. Once the pregnancy has progressed beyond 34 weeks of gestation, the benefits of prolonging the pregnancy do not justify the maternal risk of tocolytic therapy (Witcher, 2002). The use of tocolytics (medications that suppress uterine activity) in an attempt to prevent preterm birth has been the subject of research since the late 1970s. At first, it was thought that use of tocolytic therapy could prolong a threatened pregnancy indefinitely; research has demonstrated only a small improvement in prolonging pregnancy to a term birth. Once uterine contractions are suppressed, maintenance therapy may be implemented in an attempt to continue the suppression, or tocolytic treatment can be discontinued and resumed only if uterine contractions begin again. Research findings suggest that there appears to be no significant difference when tocolytic treatment approaches are compared and that continued maintenance tocolytic therapy has no more than minimal value (Berkman et al., 2003).

It is now thought that the best reason to use tocolytics is that they afford the opportunity to begin administering antenatal glucocorticoids to accelerate fetal lung maturity and reduce the severity of sequelae in infants born preterm.
Contraindications to Tocolysis

Tocolytic therapy is administered by a subcutaneous injection of 0.25 mg to suppress preterm labor. Terbutaline is most commonly administered intravenously as one of the first steps in suppressing uterine contractions; however, magnesium sulfate, terbutaline, and nifedipine are most commonly used in U.S. hospitals (Rideout, 2005). These drugs are used on an “off-label” basis (i.e., drugs known to be effective for a specific purpose, although not specifically developed and tested for this purpose). Important contraindications exist to the use of all tocolytics (Box 24-5). Because these medications have the potential for serious adverse reactions for mother and fetus, close nursing supervision during treatment is critical (Lehne, 2001) (Box 24-6 and Medication Guide).

Magnesium sulfate is the most commonly used tocolytic agent, because maternal and fetal or neonatal adverse reactions are less common than with other tocolytic agents, especially the beta-adrenergic agonists. Although its exact mechanism of action on uterine muscle is unclear, magnesium sulfate does promote relaxation of smooth muscles (Jami, 2002; Witcher, 2002). At the onset of preterm labor, magnesium sulfate is administered via an intravenous infusion. Terbutaline, 0.25 mg, may be injected subcutaneously before the initiation of the magnesium sulfate infusion and then administered again by subcutaneous pump as the infusion is discontinued and the woman prepared for discharge to home care (see Medication Guide).

Ritodrine and terbutaline, beta-adrenergic agonist medications for tocolysis, work by relaxing uterine smooth muscle as a result of stimulation of beta, receptors on uterine smooth muscle. Although seldom used, ritodrine is usually administered first as one of the first steps in suppressing preterm labor. Terbutaline is most commonly administered by a subcutaneous injection of 0.25 mg to suppress uterine hyperactivity or by a subcutaneous pump. Effectiveness of pump therapy in prolonging gestation is controversial. Terbutaline also may be administered orally. Oral and pump therapy are similar in terms of effectiveness and adverse reactions (Witcher, 2002).

Beta2-adrenergic agonists have many maternal and fetal cardiopulmonary and metabolic adverse reactions in part related to beta2 stimulation and must always be used with extreme caution and careful, conscientious nursing care. Fewer neonatal adverse reactions occur if the administration of the beta-adrenergic agonist is discontinued at least 4 hours before birth (Witcher, 2002). Medication administration and nursing care are aimed at maintaining a therapeutic level of medication and avoiding the most serious side effects while maintaining optimal health of the fetus (see Medication Guide).

Caution must be used when administering intravenous fluids to women in preterm labor because this practice can increase the risk for tocolytic-induced pulmonary edema, especially when a beta-adrenergic agonist or magnesium sulfate is used. It is recommended that the total oral and intravenous fluid intake in 24 hours be restricted to 1500 to 2400 ml. Strict intake and output measurement, daily weight determination, and assessment of pulmonary function should be instituted (Gilbert & Harmon, 2003; Witcher, 2002).

Nifedipine, a calcium channel blocker, is another tocolytic agent that can suppress contractions. It works by inhibiting calcium from entering smooth muscle cells, thus reducing uterine contractions (Lehne, 2001). Mild maternal side effects and ease of administration have increased its use. When the tocolytic effects and maternal tolerance of nifedipine and beta-adrenergic agonists were compared, no significant

**BOX 24-6 Nursing Care for Women Receiving Tocolytic Therapy**

- Explain the purpose and side effects of tocolytic therapy to woman and her family.
- Position woman on her side to enhance placental perfusion and reduce pressure on the cervix.
- Monitor maternal vital signs, fetal heart rate, and labor status according to hospital protocol and professional standards.
- Assess mother and fetus for signs of adverse reactions related to the tocolytic being administered.
- Determine maternal fluid balance by measuring daily weight and intake and output (I&O).
- Limit fluid intake to 2500 to 3000 ml/day, especially if a beta-adrenergic agonist is being administered.
- Provide psychosocial support and opportunities for women and family to express feelings and concerns.
- Offer comfort measures as required.
- Encourage diversional activities and relaxation techniques.

**NURSE ALERT**

Severe preeclampsia or eclampsia
Active vaginal bleeding
Intrauterine infection
Cardiac disease
Medical or obstetric condition that contraindicates continuation of pregnancy

**Estimated gestational age over 37 weeks**
**Dilation over 4 cm**
**Fetal demise**
**Lethal fetal anomaly**
**Chorioamnionitis**
**Acute fetal distress**
**Chronic intrauterine growth restriction**

**MATERNAL**

**FETAL**

**Contraindications to Tocolysis**

**BOX 24-5**
differences in length of delay of birth were found, but significantly fewer maternal side effects occurred with nifedipine. Maternal side effects relate primarily to hypotension that occurs with administration. Concerns regarding adverse fetal effects have been reduced. Safety is achieved by following recommended dosages and maintaining maternal blood pressure, thereby preserving effective uteroplacental perfusion (Iams & Creasy, 2004; Witcher, 2002) (see Medication Guide).

Indomethacin, a nonsteroidal antiinflammatory drug (NSAID), has been shown in some trials to suppress preterm labor by blocking the production of prostaglandins. Two prostaglandins are affected, prostacyclin and thromboxane. The decrease in prostacyclin suppresses uterine contractions,

<table>
<thead>
<tr>
<th>Medication Guide</th>
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<tbody>
<tr>
<td><strong>Tocolytic Therapy for Preterm Labor</strong></td>
</tr>
<tr>
<td><strong>MEDICATION AND ACTION</strong></td>
</tr>
<tr>
<td>Magnesium sulfate*</td>
</tr>
<tr>
<td>Terbutaline* (Brethine)</td>
</tr>
<tr>
<td>Nifedipine* (Procardia; Adalat)</td>
</tr>
</tbody>
</table>
and the decrease in thromboxane suppresses platelet aggregation. However, both of these actions increase the risk for postpartum hemorrhage. The severity of fetal side effects associated with the use of indomethacin for tocolysis makes it less common than other classes of tocolytic drugs. Risk for premature closure of the ductus arteriosus increases if treatment goes beyond 48 hours or if the fetus is aged 32 or more weeks of gestation. Therefore, limiting the use of indomethacin to a short duration of treatment (e.g., 48 hours) or to women with less than 32 weeks of gestation is recommended (Iams & Creasy, 2004; Witcher, 2002) (see Medication Guide).

### Medication Guide—cont’d

<table>
<thead>
<tr>
<th>Tocolytic Therapy for Preterm Labor</th>
<th>DOSAGE AND ROUTE</th>
<th>ADVERSE REACTIONS</th>
<th>NURSING CONSIDERATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ritodrine (Yutopar)</strong></td>
<td></td>
<td>Intravenous adverse reactions:</td>
<td>Women should be screened with ECG before therapy begins; maternal heart disease and hypertension are contraindications</td>
</tr>
<tr>
<td>Beta-adrenergic agonist; relaxes smooth muscles, inhibiting uterine activity and causing bronchodilation</td>
<td>Mix 150 mg in 500 ml isotonic intravenous solution; Attach to controller pump and piggyback to primary infusion</td>
<td>• Shortness of breath, coughing, tachypnea, pulmonary edema</td>
<td>Use cautiously if woman has type 1 diabetes or hyperthyroidism</td>
</tr>
<tr>
<td></td>
<td>Begin infusion at 0.05-0.1 mg/min; Increase rate by 0.05 mg q10min until contractions stop, intolerable adverse reactions develop, or a maximum dose of 0.33 mg/min is reached; Maintain effective dose for 12-24 hr</td>
<td>• Tachycardia, palpitations, skipped beats</td>
<td>Validate that woman is in PTL and that pregnancy is over 20 weeks of gestation</td>
</tr>
<tr>
<td><strong>Indomethacin</strong></td>
<td>Initial dose: 50 mg (orally or rectally); Maintenance dose: 25-50 mg, q4-6h for 24-48 hr (PO)</td>
<td>Maternal: Nausea and vomiting, dyspepsia, dizziness, oligohydramnios</td>
<td>Assess woman and fetus before and after each rate increase and following frequency of agency protocol</td>
</tr>
<tr>
<td>Prostaglandin inhibitor; relaxes uterine smooth muscle</td>
<td>Fetal tachycardia</td>
<td>Oral administration adverse reactions:</td>
<td>Discontinue infusion and notify physician if</td>
</tr>
<tr>
<td></td>
<td>Oral administration adverse reactions:</td>
<td>• GI distress</td>
<td>• Maternal heart rate greater than 120 to 140 beats/min; dysrhythmias, chest pain</td>
</tr>
<tr>
<td></td>
<td>Fetal tachycardia</td>
<td>Significant adverse effects are rare</td>
<td>BP is less than 90/60 mm Hg</td>
</tr>
<tr>
<td></td>
<td>Neonate: Bronchopulmonary dysplasia, respiratory distress syndrome, intracranial hemorrhage, necrotizing enterocolitis, hyperbilirubinemia</td>
<td></td>
<td>Fetal heart rate greater than 180 beats/min</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ensure that propranolol (Inderal) is available to reverse adverse effects related to cardiovascular function</td>
</tr>
</tbody>
</table>

*Caution: Not FDA approved for PTL (off-label use).*

*BP, blood pressure; CNS, central nervous system; DTRs, deep tendon reflexes; ECG, electrocardiogram; GI, gastrointestinal; IV, intravenous; PO, by mouth; PTL, preterm labor.*
Promotion of fetal lung maturity
Antenatal glucocorticoids. Antenatal glucocorticoids given as intramuscular injections to the mother accelerate fetal lung maturity. Such therapy is viewed as a form of care likely to be beneficial (Enkin et al., 2000). The National Institutes of Health consensus panel recommended that all women at 24 to 34 weeks of gestation should be given antenatal glucocorticoids when preterm birth is threatened, unless there is a medical indication for immediate birth such as cord prolapse, chorioamnionitis, or abruptio placentae (National Institutes of Health, 2000). The regimen for administration of antenatal glucocorticoids is given in the Medication Guide.

Nurses need to know that when any woman is admitted to the hospital and is 24 to 34 weeks pregnant, she should receive antenatal glucocorticoids unless she has chorioamnionitis. These drugs require a 24-hour period to become effective, so timely administration is essential.

Management of inevitable preterm birth
Labor that has progressed to a cervical dilation of 4 cm is likely to lead to inevitable preterm birth. Preterm births in tertiary care centers lead to better neonatal and maternal outcomes. Women considered at risk for inevitable preterm birth should be transferred quickly to such a facility to ensure the best possible outcome. The first dose of antenatal glucocorticoids should be given before transfer.

Although maternal transport helps to ensure a better health outcome for the mother and the baby, it may have complications. A woman may be transported to a tertiary center far from home, making visits by the family difficult and increasing the anxiety levels of the woman and her family. Attention to the needs of the woman and her family before, during, and after the transport is essential to comprehensive nursing care for these families.

Evaluation
Evaluation of the nursing care provided for a woman at risk for preterm birth is based on achievement of the expected outcomes of care (Plan of Care).

PRETERM PREMATURE RUPTURE OF MEMBRANES
Premature rupture of membranes (PROM) is the rupture of the amniotic sac and leakage of amniotic fluid beginning at least 1 hour before the onset of labor at any gestational age. Preterm premature rupture of membranes (PPROM) (i.e., membranes rupture before 37 weeks of gestation) occurs in up to 25% of all cases of preterm labor. Infection often precedes PPROM, but the cause of PPROM remains unknown. PPROM is diagnosed after the woman reports of either a sudden gush of fluid or a slow leak of fluid from the vagina.

Infection is the serious side effect of PPROM that makes it a major complication of pregnancy. Chorioamnionitis is an intraamniotic infection of the chorion and amnion that is potentially life threatening for the fetus and the woman. Most cases of intrauterine infection respond well to antibiotics, yet sepsis can occur and can lead to maternal death. Fetal complications from chorioamnionitis include congenital pneumonia, sepsis, and meningitis (Garite, 2004). Even in the absence of infection, PPROM can precipitate cord prolapse or cause oligohydramnios, leading to cord compression, potentially life-threatening complications for the fetus.

Collaborative Care
Whenever PPROM is suspected, strict sterile technique should be used in any vaginal examination to avoid introduction of infection. A nitrazine or fern test is used to determine if the discharge is amniotic fluid or urine (see Chapter 14: Procedure box: Tests for Rupture of Membranes). A
woman with this diagnosis can be cared for at home, with more frequent visits to her primary health care provider (Patient Instructions for Self-Care box). Expectant management will continue as long as there are no signs of infection or fetal distress. Nursing support of the woman and her family is critical at this time. She is often anxious about the health of her baby and may fear that she was responsible in some way for the membrane rupture. The nurse should encourage expression of feelings and concerns, provide information, and make referrals as needed (Witz, 2001).

Frequent biophysical profiles (BPPs) are performed to determine fetal health status and estimate amniotic fluid volume (AFV). The woman with PPROM also should be taught how to count fetal movements daily, because a slowing of fetal movements can signal impending labor.

Frequent biophysical profiles (BPPs) are performed to determine fetal health status and estimate amniotic fluid volume (AFV). The woman with PPROM also should be taught how to count fetal movements daily, because a slowing of fetal movements can signal impending labor.
fetal movement has been shown to be a precursor to severe fetal compromise. Several methods are commonly used to count fetal movements; two methods are described in the Patient Instructions for Self-Care box. Antenatal glucocorticoids may be administered if chorioamnionitis is absent (Weitz, 2001).

Vigilance for signs of infection is a major part of the nursing care and patient education after PPROM. The woman must be taught how to keep her genital area clean and that nothing should be introduced into her vagina. Signs of infection (e.g., fever, foul-smelling vaginal discharge, rapid pulse) should be reported to the primary health care provider immediately. Prophylactic antibiotic therapy may be ordered in an effort to prevent infection (Garite, 2004). However, use of prophylactic antibiotics for PROM before labor at term or preterm is a form of care of unknown effectiveness (Enkin et al., 2000).

Dystocia is defined as long, difficult, or abnormal labor; it is caused by various conditions associated with the five factors affecting labor. It is estimated that dystocia occurs in approximately 8% to 11% of all births and is the primary cause for cesarean births (Gregory, 2000). Dystocia can be caused by any of the following:

- Dysfunctional labor, resulting in ineffective uterine contractions or maternal bearing-down efforts (the powers). This is the most common cause of dystocia (Cunningham et al., 2005).
- Alterations in the pelvic structure (the passage).
- Fetal causes, including abnormal presentation or position, anomalies, excessive size, and number of fuses (the passenger).
- Maternal position during labor and birth.
- Psychologic responses of the mother to labor related to past experiences, preparation, culture and heritage, and support system.

These five factors are interdependent. In assessing the woman for an abnormal labor pattern, the nurse must consider the way in which these factors interact and influence labor progress. Dystocia is suspected when there is an alteration in the characteristics of uterine contractions, a lack of progress in the rate of cervical dilation, or a lack of progress in fetal descent and expulsion.

Dysfunctional Labor

Dysfunctional labor is described as abnormal uterine contractions that prevent the normal progress of cervical dilation, effacement (primary powers), or descent (secondary powers). Gilbert and Harmon (2003) cited several factors that seem to increase a woman’s risk for uterine dystocia including the following:

- Body build (e.g., 30 pounds or more overweight, short stature)
- Uterine abnormalities (e.g., congenital malformations; overdistention, as with multiple gestation; or hydramnios)
- Malpresentations and positions of the fetus
- Cephalopelvic disproportion (CPD) (see p. 785)
- Overstimulation with oxytocin
- Maternal fatigue, dehydration and electrolyte imbalance, and fear
- Inappropriate timing of analgesic or anesthetic administration

Dysfunction of uterine contractions can be further described as being hypertonic or hypotonic.

Hypertonic uterine dysfunction

The woman experiencing hypertonic uterine dysfunction, or primary dysfunctional labor, often is an anxious first-time mother who is having painful and frequent contractions that are ineffective in causing cervical dilation or effacement to progress. These contractions usually occur in the latent stage
(cervical dilation of less than 4 cm) and are usually uncoordinated (Fig. 24-3). The force of the contractions may be in the midsection of the uterus rather than in the fundus, and the uterus is therefore unable to apply downward pressure to push the presenting part against the cervix. The uterus may not relax completely between contractions (Gilbert & Harmon, 2003). Secondary powers, or bearing-down efforts, are compromised when large amounts of analgesia are given. Anesthesia may also block the bearing-down reflex and, as a result, alter the effectiveness of voluntary efforts. Exhaustion resulting from lack of sleep or long labor and fatigue resulting from inadequate hydration and food intake reduce the effectiveness of the woman’s voluntary efforts. Maternal position can work against the forces of gravity and decrease the strength and efficiency of the contractions. Table 24-1 summarizes the characteristics of dysfunctional labor.

Abnormal labor patterns

In 2002, prolonged labor patterns occurred at the rate of 7.0 per 1000 live births, with the incidence highest among women under 20 years of age (8.1 per 1000) (Martin et al., 2003).

Six abnormal labor patterns were identified and classified by Friedman (1989) according to the nature of the cervical dilation and fetal descent. The labor patterns seen in normal and abnormal labor are described in Table 24-2.

These patterns may result from a variety of causes, including ineffective uterine contractions, pelvic contractures, CPD, abnormal fetal presentation or position, early use of analgesics, nerve block analgesia or anesthesia, and anxiety and stress. Progress in either the first or second stage of labor can be protracted (prolonged) or arrested (stopped). Abnormal progress can be identified by plotting cervical dilation and fetal descent on a labor graph (partogram) at various intervals after the onset of labor and comparing the resulting curve with the expected labor curve for a nulliparous or multiparous labor (see Fig. 14-4, p. 415).

However, health care providers must be careful when diagnosing a labor pattern as prolonged and when intervening based on this diagnosis. Cesario (2004) found that although the average length of labor today is similar to that found by Friedman, a wider range of normal labor occurs. Parameters to determine if labor is progressing satisfactorily may need to be expanded.

A long and difficult labor can have an adverse psychologic effect on the mother, father, and family. Maternal morbidity and death may occur as a result of uterine rupture, infection, severe dehydration, and postpartum hemorrhage. The fetus is at increased risk for hypoxia.

![Uterine contractility patterns in labor](image)
Precipitous labor. Precipitous labor is defined as labor that lasts less than 3 hours from the onset of contractions to the time of birth. This abnormal labor pattern occurred at a rate of 18.1 per 1000 live births in 2002. Precipitous labor occurred at the highest rate (21.9) among women age 35 to 39 and at the lowest rate (11.7) among women younger than 20 years old (Martin et al., 2003).

Precipitous labor may result from hypertonic uterine contractions that are tetanic in intensity. Maternal and fetal complications can occur as a result. Maternal complications include uterine rupture, lacerations of the birth canal, amniotic fluid embolism (AFE) (p. 813), and postpartum hemorrhage. Fetal complications include hypoxia, caused by decreased periods of uterine relaxation between contractions, and in rare instances, intracranial trauma related to rapid birth (Cunningham et al., 2005).

Women who have experienced precipitous labor often describe feelings of disbelief that their labor began so quickly, alarm that their labor progressed so rapidly, panic about the possibility they would not make it to the hospital in time to give birth, and finally relief when they arrived at the hospital. In addition, women have expressed frustration when nurses did not believe them when they reported their readiness to push.

<table>
<thead>
<tr>
<th>TABLE 24-1</th>
<th>Dysfunctional Labor: Primary and Secondary Powers</th>
</tr>
</thead>
<tbody>
<tr>
<td>HYPERTONIC UTERINE DYSFUNCTION</td>
<td>HYPTONIC UTERINE DYSFUNCTION</td>
</tr>
<tr>
<td>DESCRIPTION</td>
<td>Cause may be pelvic contracture and fetal malposition, overdistention of uterus (e.g., twins), or unknown (primary powers)</td>
</tr>
<tr>
<td></td>
<td>Pain out of proportion to intensity of contraction</td>
</tr>
<tr>
<td></td>
<td>Pain out of proportion to effectiveness of contraction in effacing and dilating the cervix</td>
</tr>
<tr>
<td></td>
<td>Contractions increase in frequency</td>
</tr>
<tr>
<td></td>
<td>Contractions uncoordinated</td>
</tr>
<tr>
<td></td>
<td>Uterus is contracted between contractions, cannot be indented</td>
</tr>
<tr>
<td>CHANGE IN PATTERN OF PROGRESS</td>
<td>Contraction decrease in frequency and intensity</td>
</tr>
<tr>
<td></td>
<td>Uterus easily indentable even at peak of contraction</td>
</tr>
<tr>
<td></td>
<td>Uterus relaxed between contractions (normal)</td>
</tr>
<tr>
<td>POTENTIAL MATERNAL EFFECTS</td>
<td>Infection</td>
</tr>
<tr>
<td></td>
<td>Exhaustion</td>
</tr>
<tr>
<td></td>
<td>Psychologic trauma</td>
</tr>
<tr>
<td>POTENTIAL FETAL EFFECTS</td>
<td>Fetal asphyxia with meconium aspiration</td>
</tr>
<tr>
<td></td>
<td>Fetal infection</td>
</tr>
<tr>
<td></td>
<td>Fetal and neonatal death</td>
</tr>
<tr>
<td>CARE MANAGEMENT</td>
<td>Rule out cephalopelvic disproportion</td>
</tr>
<tr>
<td></td>
<td>Stimulate labor with oxytocin (augmentation)</td>
</tr>
<tr>
<td></td>
<td>Perform amniotomy</td>
</tr>
<tr>
<td></td>
<td>Assist with measures to enhance the progress of labor (e.g., position changes, ambulation, hydrotherapy)</td>
</tr>
<tr>
<td></td>
<td>Initiate therapeutic rest measures</td>
</tr>
<tr>
<td></td>
<td>• Administer analgesic (e.g., morphine, nalbuphine, meperidine) if membranes not ruptured or cephalopelvic disproportion not present</td>
</tr>
<tr>
<td></td>
<td>• Relieve pain to permit mother to rest</td>
</tr>
<tr>
<td></td>
<td>• Assist with measures to enhance rest and relaxation (e.g., hydrotherapy)</td>
</tr>
</tbody>
</table>

*Note: The table above provides a summary of the potential maternal and fetal effects and care management strategies for dysfunctional labor.*
is fully dilated. Midforceps-assisted birth usually is not done
vacuum-assisted birth has been used safely when the cervix
internally. These infants are usually born by cesarean, but
the fetal head) in such births because the head cannot rotate
spinous and posterior sagittal diameters of the midpelvis is
dystocia, is diagnosed whenever the sum of the interischial
develops during labor when the cervix is caught between
the presenting part and the symphysis pubis or when the
woman begins bearing-down efforts prematurely, thereby in-
hibiting complete dilation. Sexually transmitted infections
(e.g., human papillomavirus) can alter cervical tissue integrity
and thus interfere with adequate effacement and dilation.
Band l ring, a pathologic retraction ring that forms be-
tween the upper and lower uterine segments (see Fig. 11-10),
is associated with prolonged rupture of membranes, pro-
tracted labor, and increased risk for uterine rupture
(Cunningham et al., 2005).

Fetal Causes
Dystocia of fetal origin may be caused by anomalies, ex-
cessive fetal size and malpresentation, malposition, or mul-
tifetal pregnancy. Complications associated with dystocia of
fetal origin include neonatal asphyxia, fetal injuries or frac-
tures, and maternal vaginal lacerations. Although sponta-
neous vaginal birth is possible in these instances, a low
forceps-assisted, vacuum-assisted, or cesarean birth often is
necessary.

Anomalies
Gross ascites, large tumors, and open neural tube defects
e.g., myelomeningocele, hydrocephalus) are fetal anomalies
that can cause dystocia. The anomalies affect the relation of
the fetal anatomy to the maternal pelvic capacity, with the
result that the fetus is unable to descend through the birth

tinal labor and birth at risk

Chapter 24

Labor Patterns in Normal
and Abnormal Labor

TABLE 24-2

Labor Patterns in Normal
and Abnormal Labor

<table>
<thead>
<tr>
<th>PATTERN</th>
<th>NULLIPARAS</th>
<th>MULTIPARAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prolonged latent phase</td>
<td>&gt;20 hr</td>
<td>&gt;14 hr</td>
</tr>
<tr>
<td>Protracted active phase dilation</td>
<td>&lt;1.2 cm/hr</td>
<td>&lt;1.5 cm/hr</td>
</tr>
<tr>
<td>Secondary arrest:</td>
<td>&gt;2 hr</td>
<td>&gt;2 hr</td>
</tr>
<tr>
<td>no change</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protracted descent</td>
<td>&lt;1 cm/hr</td>
<td>&lt;2 cm/hr</td>
</tr>
<tr>
<td>Arrest of descent</td>
<td>&gt;1 hr</td>
<td>&gt;1/2 hr</td>
</tr>
<tr>
<td>Failure of descent</td>
<td>No change during deceleration phase and second stage</td>
<td></td>
</tr>
<tr>
<td>Precipitous labor</td>
<td>&gt;5 cm/hr</td>
<td>10 cm/hr</td>
</tr>
</tbody>
</table>

Alterations in Pelvic Structure
Pelvic dystocia can occur whenever there are contractures
of the pelvic diameters that reduce the capacity of the bony
pelvis, including the inlet, midpelvis, outlet, or any combi-
nation of these planes.

Disproportion of the pelvis is the least common cause of
dystocia (Cunningham et al., 2005). Pelvic contractures may
be caused by congenital abnormalities, maternal malnutri-
tion, neoplasms, or lower spinal disorders. An immature
pelvic size predisposes some adolescent mothers to pelvic
dystocia. Pelvic deformities also may be the result of auto-
mobile or other accidents or trauma.

An inlet contracture is diagnosed whenever the diagonal
conjugate is less than 11.5 cm. The incidence of face and
shoulder presentation is increased. Because these presenta-
tions interfere with engagement and fetal descent, the risk
of prolapse of the umbilical cord is increased. Inlet con-
tracture is associated with maternal rickets and a flat pelvis.
Weak uterine contractions may be noted during the first
stage of labor in affected women.

Midplane contracture, the most common cause of pelvic
dystocia, is diagnosed whenever the sum of the interischial
spinous and posterior sagittal diameters of the midpelvis is
13.5 cm or less. Fetal descent is arrested (transverse arrest of
the fetal head) in such births because the head cannot rotate
internally. These infants are usually born by cesarean, but
vacuum-assisted birth has been used safely when the cervix
is fully dilated. Midforceps-assisted birth usually is not done
because of the increased perinatal morbidity associated with
this intervention.

Outlet contracture exists when the interischial diameter
is 8 cm or less. It rarely occurs in the absence of midplane
contracture. Women with outlet contracture have a long, nar-
row pubic arch and an android pelvis, and this causes fetal
descent to be arrested. Maternal complications include ex-
tensive perineal lacerations during vaginal birth because the
fetal head is pushed posteriorly.

Soft-tissue dystocia

Soft-tissue dystocia results from obstruction of the birth
passage by an anatomic abnormality other than that in-
volving the bony pelvis. The obstruction may result from pla-
centa previa (low-lying placenta) that partially or completely
obstructs the internal os of the cervix. Other causes, such as
leiomomas (uterine fibroids) in the lower uterine segment,
ovarian tumors, and a full bladder or rectum, may prevent
the fetus from entering the pelvis. Occasionally cervical
edema occurs during labor when the cervix is caught between
the presenting part and the symphysis pubis or when the
woman begins bearing-down efforts prematurely, thereby in-
hibiting complete dilation. Sexually transmitted infections
(e.g., human papillomavirus) can alter cervical tissue integrity
and thus interfere with adequate effacement and dilation.

Cephalo-pelvic disproportion

Cephalopelvic disproportion (CPD), also called intrapelvic dispro-
portion (FPD), is often related to excessive fetal size (i.e.,
4000 g or more). When CPD is present, the fetus cannot fit
through the maternal pelvis to be born vaginally. Excessive
fetal size, or macrosomia, is associated with maternal diabetes


mellitus, obesity, multiparity, or the large size of one or both parents. If the maternal pelvis is too small, abnormally shaped, or deformed, CPD may be of maternal origin. In this case, the fetus may be of average size or even smaller.

**Malposition**

The most common fetal malposition is persistent occipitoposterior position (i.e., right occipitoposterior [ROP] or left occipitoposterior [LOP]; see Chapter 11), occurring in about 25% of all labors. Labor, especially the second stage, is prolonged; the woman typically complains of severe back pain from the pressure of the fetal head (occiput) pressing against her sacrum. Box 24-7 identifies suggested measures to relieve back pain and facilitate rotation of the fetal occiput to an anterior position, which will facilitate birth (Gilbert & Harmon, 2003; Simkin & Ancheta, 2000).

**Malpresentation**

Malpresentation is the third most commonly reported complication of labor and birth. Breech presentation is the most common form of malpresentation. The four main types of breech presentation are frank breech (thighs flexed, knees extended), complete breech (thighs and knees flexed), and two types of incomplete breech, one in which the knee extends below the buttocks and the other in which the foot extends below the buttocks (Fig. 24-4). Breech presentations are associated with multifetal gestation, preterm birth, fetal and maternal anomalies, hydramnios, and oligohydramnios. Diagnosis is made by abdominal palpation (e.g., Leopold maneuvers) and vaginal examination and usually is confirmed by ultrasound scan (Lanni & Seeds, 2002).

During labor, the descent of the fetus in a breech presentation may be slow because the breech is not so good a dilating wedge as is the fetal head; the labor itself usually is not prolonged. There is risk of prolapse of the cord if the membranes rupture in early labor. The presence of meconium in amniotic fluid is not necessarily a sign of fetal distress because it results from pressure on the fetal abdominal wall as it traverses the birth canal. Assessment of FHR and pattern should be used to determine whether the passage of meconium is an expected finding associated with breech presentation or is a nonreassuring sign associated with fetal hypoxia. The fetal heart tones of infants in a breech position are best heard at or above the umbilicus.

**BOX 24-7**

**Back Labor—Occiput Posterior Position**

**MEASURES TO RELIEVE BACK PAIN AND FACILITATE ROTATION OF FETAL HEAD**

**Measures to reduce back pain during a contraction**

- Counterpressure: apply fist or heel of hand to sacral area
- Heat or cold applications: apply to sacral area
- Double hip squeeze:
  - Woman assumes a position with hip joints flexed, such as knee-chest
  - Partner, nurse, or doula places hands over gluteal muscles and presses with palms of hands up and inward toward the center of the pelvis
- Knee press:
  - Woman assumes a sitting position with knees a few inches apart and feet flat on the floor or on a stool
  - Partner, nurse, or doula cups a knee in each hand with heels of hands on top of tibia then presses the knees straight back toward the woman's hips while leaning forward toward the woman

**Measures to facilitate the rotation of the fetal head (may also relieve back pain)**

- Lateral abdominal stroking: stroke the abdomen in direction that the fetal head should rotate
- Hands-and-knees position (all-fours): can also be accomplished by kneeling while leaning forward over a birth ball, padded chair seat, bed, or over-the-bed table
- Squatting
- Pelvic rocking
- Stair climbing
- Lateral position: lie on side toward which the fetus should turn
- Lunges: widens pelvis on side toward which woman lunges
  - Woman stands, facing forward, next to or alongside a chair so that she can lunge toward the side the fetal back is on or in the direction of the fetal occiput
  - Places foot on seat of chair with toes pointed toward the back of the chair, then lunges
  - Alternative position for lunge: kneeling

![Fig. 24-4 Types of breech presentation. A, Frank breech: thighs are flexed on hips; knees are extended. B, Complete breech: thighs and knees are flexed. C, Incomplete breech: foot extends below the buttocks. D, Incomplete breech: knee extends below the buttocks.](image-url)
EVIDENCE-BASED PRACTICE
Planned Caesarean Birth versus Vaginal Birth for Term Breech Presentation

BACKGROUND
• Breech presentation at birth has been associated with nul-liparity, previous breech, uterine or pelvic anomaly, pla-cental malpresentation, too much or too little amniotic fluid, extended fetal legs, multiple pregnancy, preterm birth, shortened umbilical cord, decreased fetal activity, in-trauterine growth restriction (IUGR), fetal anomaly, and stillbirth. Commonly, breech presentation is an indication for a caesarean birth. Some researchers speculate that the breech position itself is an indicator of poor outcome. For example, the rate of childhood handicaps among breech babies is high, no matter what method of birth is em-ployed. In addition, caesarean birth exposes the mother and baby to all the risks of operative procedures: anes-thesia problems, infection, pain, delayed recovery, im-mobility, ileus, uterine rupture in future pregnancies, and neonatal respiratory problems. Length of stay and cost also rise considerably.

OBJECTIVES
• The reviewers sought to compare the maternal and peri-natal outcomes of routine caesarean birth for term breech presentation, compared with term breech presentations delivered vaginally. The perinatal outcomes are death (ex-cluding fatal anomalies), serious neonatal morbidity (Ap-gar score less than 7, cord blood pH less than 7.0, neona-tal intensive care admission, birth asphyxia, birth trauma), and disability in childhood. Maternal outcomes include death, pain, incontinence, instrumental delivery, hemor-rhage, infection, depression, self-esteem, relationship with infant and family, problems with future pregnancies and deliveries, satisfaction, and costs. All women should be considered suitable for vaginal birth.

METHODS
Search Strategy
• The authors searched the Cochrane database, MEDLINE, 36 journals and conference proceedings, and a weekly current awareness service of 37 journals. Search keyword was breach.
• Three randomized, controlled trials met the criteria, rep-resenting 2396 women. Two trials, dated 1980 and 1983, were from the United States. The other trial, dated 2000, was a large, international multicenter trial whose coun-tries were not noted in the review.

Statistical Analyses
• Similar data were pooled. Reviewers calculated relative risks for dichotomous data, and weighted mean differ-ences for continuous data. Countries with low (20 per 1000 or less) and high (more than 20 per 1000) perinatal mortality rates were subgrouped for comparison.

FINDINGS
• Of the women with term breech presentation allocated to vaginal birth, 45% gave birth by caesarean. Those sched-uled for caesarean births experienced significantly fewer perinatal deaths (excluding fatal anomalies), decreased short-term neonatal morbidity, fewer low Apgar (less than 7) or very low Apgar (less than 4) scores, less acidotic cord blood, and less cord base excess (15 or more) than did the planned vaginal birth group. The reduction in risk of perinatal mortality and morbidity was less in countries with high perinatal mortality rates. No difference in infant birth trauma was noted between groups. A small but sig-nificant increase in short-term maternal morbidity was found in the planned caesarean group. At 3 months post-partum the planned caesarean group experienced less uri-nary incontinence and perineal pain, and more abdom-inal pain, than the planned vaginal birth group.

LIMITATIONS
• The two smaller U.S. studies from 1980 and 1983 did not specify the method of randomization. One of those stud-ies had a large discrepancy in numbers between groups. The large multicenter trial used a wide variety of clinical settings and had good follow-up rates, which were strengths.

CONCLUSIONS
• There is evidence that planned caesarean birth in term breech presentations is associated with decreased peri-natal death and morbidity rates and an increase in short-term maternal morbidity.

IMPLICATIONS FOR PRACTICE
• Planned caesarean birth is not always desirable or fea-sible in all settings. External cephalic version, or the ultrasound-guided process of manually changing the fe-tal presentation from outside the abdomen, is one alter-native. Promising results have been noted in other al-ternative practices, such as using various positions and moxibustion. (Moxibustion is a method of producing analgesia by holding slow-burning moxa or another sub-stance near the skin without causing pain or burning; sometimes used in conjunction with acupuncture.) Even caesarean birth does not totally eliminate the problems as-sociated with breech presentation. Diagnosis of the pre-sentation before labor is desirable.

IMPLICATIONS FOR FURTHER RESEARCH
• Much more evidence is needed on the effects of caesarean births, for breech presentation or other indication, on long-term outcomes, such as reproductive function of women and child development. Researchers need to as-sess the psychologic impact of caesarean birth on women and their adaptation to parenting. Cost was not addressed in these trials but remains a primary factor in policy mak-ing and decision making.

Vaginal birth is accomplished by mechanisms of labor that manipulate the buttocks and lower extremities as they emerge from the birth canal (Fig. 24-5). Piper forceps sometimes are used to deliver the head. External cephalic version (ECV) (see later discussion) may be tried to turn the fetus to a vertex presentation (Fig. 24-6). Cesarean birth may be necessary (Bowes & Thorp, 2004).

Although opinions vary, a cesarean birth is commonly performed when the fetus is estimated to be larger than 3800 g or smaller than 1500 g, if this is a first pregnancy, if labor is ineffective, or if complications occur. Although cesarean birth reduces the risks to the fetus, the maternal risks are increased. ECV also poses risks and is not always successful. Women whose breech presentation occurs late in pregnancy need to be informed of the options for birth, as well as the risks associated with each option.

Face and brow presentations are uncommon and are associated with fetal anomalies, pelvic contractures, and CPD. Vaginal birth is possible if the fetus flexes to a vertex presentation, although forceps often are used. Cesarean birth is indicated if the presentation persists, if there is fetal distress, or if labor stops progressing.

Cesarean birth is usually necessary for a fetus in a shoulder presentation (i.e., the fetus is in a transverse lie), although ECV may be attempted after 38 weeks of gestation (Bowes & Thorp, 2004).

**Multifetal pregnancy**

Multifetal pregnancy is the gestation of twins, triplets, quadruplets, or more infants. The twin birth rate was 31.1 per 1000 live births in 2002. The higher-order multiple birth rate (i.e., triplet and more) was 184 per 100,000 live births in 2002 (Martin et al., 2003). The incidence of multiple births has been increasing since 1980. It is likely that this trend is related to the use of fertility-enhancing medications and procedures and the older age of childbearing women. When compared with younger women, women age 35 years and older are naturally more likely to have a multifetal pregnancy.

Multiple births are associated with more complications (e.g., dysfunctional labor) than are single births. The higher incidence of fetal and newborn complications and higher risk of perinatal mortality primarily stem from the birth of low-birth-weight infants resulting from preterm birth and/or IUGR in part related to placental dysfunction and twin-to-twin transfusion. Fetuses may experience distress and asphyxia during the birth process as a result of cord prolapse and the onset of placental separation with the birth of the first fetus. As a result, the risk for long-term problems such as cerebral palsy is higher among infants who were part of a multiple birth.

In addition, fetal complications such as congenital anomalies and abnormal presentations can result in dystocia and an increased incidence of cesarean birth. For example, in only half of all twin pregnancies do both fetuses present in the vertex position, the most favorable for vaginal birth; in one third of the pregnancies, one twin may present in the vertex position and one in the breech (Cunningham et al., 2005).

The health status of the mother may be compromised by an increased risk for hypertension, anemia, and hemorrhage.
associated with uterine atony, abruptio placentae, and multiple or adherent placentas. Duration of the phases and stages of labor may vary from the duration experienced with singleton births.

Teamwork and planning are essential components of the management of childbirth in multiple pregnancies, especially those of the higher-order multiples. The nurse plays a key role in coordinating the activities of many highly skilled health care professionals. Early detection and care of maternal, fetal, and newborn complications associated with multiple births are essential to achieve a positive outcome for mother and babies. Maternal positioning and active support are used to enhance labor progress and placental perfusion. Stimulation of labor with oxytocin, epidural anesthesia, forceps and vacuum assistance, and internal or external version may be used to accomplish the vaginal birth of twins. Cesarean birth is most likely with higher-order multiple births. Each infant may have its own team of health care providers present at the birth. Emotional support that includes expression of feelings and full explanations of events as they occur and of the status of the mother and the fetuses and newborns is important to reduce the anxiety and stress that the mother and her family experience.

**Position of the Woman**

The functional relationship among the uterine contractions, the fetus, and the mother’s pelvis are altered by the maternal position. Teamwork and planning are essential components of the management of childbirth in multiple pregnancies, especially those of the higher-order multiples. The nurse plays a key role in coordinating the activities of many highly skilled health care professionals. Early detection and care of maternal, fetal, and newborn complications associated with multiple births are essential to achieve a positive outcome for mother and babies. Maternal positioning and active support are used to enhance labor progress and placental perfusion. Stimulation of labor with oxytocin, epidural anesthesia, forceps and vacuum assistance, and internal or external version may be used to accomplish the vaginal birth of twins. Cesarean birth is most likely with higher-order multiple births. Each infant may have its own team of health care providers present at the birth. Emotional support that includes expression of feelings and full explanations of events as they occur and of the status of the mother and the fetuses and newborns is important to reduce the anxiety and stress that the mother and her family experience.

**Psychologic Responses**

Hormones and neurotransmitters released in response to stress (e.g., catecholamines) can cause dystocia. Sources of stress vary for each woman, but pain and the absence of a support person are two recognized factors. Confine ment to bed and restriction of maternal movement can be a source of psychologic stress that compounds the physiologic stress caused by immobility in the unmedicated laboring woman. When anxiety is excessive, it can inhibit cervical dilation and result in prolonged labor and increased pain perception. Anxiety also causes increased levels of stress-related hormones (e.g., beta-endorphin, adrenocorticotropic hormone, cortisol, and epinephrine). These hormones act on the smooth muscles of the uterus; increased levels can cause dystocia by reducing uterine contractility.

**Assessment and Nursing Diagnoses**

Risk assessment is a continuous process in the laboring woman. Review of the findings obtained during the initial interview conducted at the woman’s admission to the labor unit and ongoing observations of her psychologic response to labor may reveal factors that can be a source of dysfunctional labor. These factors may include anxiety or fear, a complication of pregnancy, or previous labor complications. The initial physical assessment and ongoing assessments provide information about maternal well-being; status of labor in terms of the characteristics of uterine contractions and progress of cervical effacement and dilation; fetal well-being in terms of FHR and pattern, presentation, station, and position; and status of the amniotic membranes. Ultrasound scanning can identify potential problems related to the fetus or maternal pelvis. All these assessments contribute to accurate identification of
potential and actual nursing diagnoses related to dystocia and maternal-fetal compromise. Nursing diagnoses that might be identified in women experiencing dystocia include the following:

- Risk for maternal or fetal injury related to interventions implemented for dystocia
- Powerlessness related to: —loss of control
- Risk for infection related to: —PFROM —operative procedures
- Ineffective individual coping related to —inadequate support system. —exhaustion —pain

**Expected Outcomes of Care**

Expected outcomes for the woman with dystocia include the following. The woman will:

- Understand the causes and treatment of dysfunctional labor
- Use measures recommended by the health care team to enhance the progress of labor and birth
- Express relief of pain
- Experience labor and birth with minimal or no complications, such as infection, injury, or hemorrhage
- Give birth to a healthy infant who has experienced no fetal distress or birth injury

**Plan of Care and Interventions**

Nurses assume many caregiving roles when labor is complicated. They also work collaboratively with other health care providers in providing care. Interventions that the nurse may implement or assist with include ECV, trial of labor, cervical ripening with prostaglandins, induction or augmentation with oxytocin, amniotomy, and operative procedures (e.g., forceps- or vacuum-assisted birth). The nursing role is identified with each of the procedures described.

**LEGAL TIP**

**Standard of Care—Labor and Birth**

**Complications**

- Document all assessment findings, interventions, and patient responses on patient record and monitor strips according to unit protocols, procedures, and policies and professional standards.
- Assess whether the woman (and her family, if appropriate) is fully informed about procedures for which she is consenting.
- Provide full explanations regarding what is happening and what needs to be done to help her and her baby (see Guidelines/Guías boxes: Induction of Labor, p. 791, and Cesarean Birth, p. 802).
- Maintain safety by administering medications and treatments correctly.
- Have verbal orders signed as soon as possible.
- Provide care at the acceptable standard (e.g., according to hospital protocols and professional standards).
- If short staffing occurs in the unit and the nurse is assigned additional patients, the nurse should document that rejecting this additional assignment would have placed these patients in danger as a result of abandonment.
- Maternal and fetal monitoring continues until birth according to the policies, procedures, and protocols of the birthing facility, even when a decision to carry out cesarean birth is made.

**Version**

Version is the turning of the fetus from one presentation to another and may be done either externally or internally by the physician.

**External cephalic version.** External cephalic version (ECV) is used to attempt to turn the fetus from a breech or shoulder presentation to a vertex presentation for birth. It may be attempted in a labor and birth setting after 37 weeks of gestation. ECV is accomplished by the exertion of gentle, constant pressure on the abdomen (see Fig. 24-6). Before ECV is attempted, ultrasound scanning is done to determine the fetal position; locate the umbilical cord; rule out placenta previa; evaluate the adequacy of the maternal pelvis; and assess the amount of amniotic fluid, the fetal age, and the presence of any anomalies. A non-stress test (NST) is performed to confirm fetal well-being, or the FHR pattern is monitored for a period of time (e.g., 10 to 20 minutes). Informed consent is obtained. A tocolytic agent such as magnesium sulfate or terbutaline often is given to relax the uterus and to facilitate the manipulation of the fetal back (Bowes & Thorp, 2004). Factors that are associated with unsuccessful version include maternal obesity, oligohydramnios, deep engagement of the buttocks, and posterior position of the fetal back. ECV is controversial in women who have had a previous cesarean birth (Cunningham et al., 2005; Lanni & Seeds, 2002). ECV performed at term to avoid breech birth is a beneficial form of care (Enkin et al., 2000).

During an attempted ECV, the nurse continuously monitors the FHR and pattern, especially for bradycardia and variable decelerations; checks the maternal vital signs; and assesses the woman’s level of comfort because the procedure may cause discomfort. After the procedure is completed, the nurse continues to monitor maternal vital signs, uterine activity, and FHR and pattern and to assess for vaginal bleeding until the woman’s condition is stable. Women who are Rh negative should receive Rh immune globulin because the manipulation can cause fetomaternal bleeding (Bowes & Thorp, 2004).

**Internal version.** With internal version, the fetus is turned by the physician, who inserts a hand into the uterus and changes the presentation to cephalic (head) or podalic (foot). Internal version may be used in multifetal pregnancies to deliver the second fetus. The safety of this procedure has not been documented; maternal and fetal injury is possible. Cesarean birth is the usual method for managing malpresentation in multifetal pregnancies. The nurse’s role is to
monitor the status of the fetus and to provide support to the woman.

**Trial of labor**

A **trial of labor (TOL)** is the observance of a woman and her fetus for a reasonable period (e.g., 4 to 6 hours) of spontaneous active labor to assess safety of vaginal birth for the mother and infant. It may be initiated if the mother’s pelvis is of questionable size or shape, if the fetus is in an abnormal presentation, or if the woman wishes to have a vaginal birth after a previous cesarean birth. It is a form of care likely to be beneficial when implemented after a previous low-segment cesarean birth (Elnik et al., 2000). Fetal sonography, maternal pelvimetry, or both may be done before a TOL to rule out CPD. The cervix must be ripe (e.g., soft, dilatable). During a TOL, the woman is evaluated for the occurrence of active labor, including adequate contractions, engagement and descent of the presenting part, and effacement and dilation of the cervix. The nurse assesses maternal vital signs and FHR and pattern and is alert for signs of potential complications. If complications develop, the nurse is responsible for initiating appropriate actions, including notifying the primary health care provider, and for evaluating and documenting the maternal and fetal responses to the interventions. Nurses must recognize that the woman and her partner are often anxious and fetal responses to the interventions. Nurses must recognize that the woman and her partner are often anxious and increasing stress (e.g., frightening the woman). It is important for the nurse to know the practices a woman may believe in and follow, because some of these methods can be harmful (e.g., strenuous activity) (Schaffir, 2002). Success rates for induction of labor are higher when the condition of the cervix is favorable, or inducible. A rating system such as the Bishop score (Table 24-3) can be used to evaluate inducibility. For example, a score of 9 or more on this 13-point scale indicates that the cervix is soft, anterior, 50% or more effaced, and dilated 2 cm or more; and that the presenting part is engaged. Induction of labor is likely to be more successful if the score is 9 or more for nulliparas and 5 or more for multiparas (Gilbert & Harmon, 2003).

**Induction of labor**

Induction of labor is the chemical or mechanical initiation of uterine contractions before their spontaneous onset for the purpose of bringing about the birth (Guidelines/Guías: Induction of Labor). Induction may be indicated for a variety of medical and obstetric reasons. These include preclampsia, diabetes mellitus, chorioamnionitis, and other medical problems, PROM, postterm pregnancy, suspected fetal jeopardy (e.g., IUGR), logistic factors such as history of previous rapid birth or distance of the woman’s home from the hospital, and fetal death. Under such conditions the risk to the mother or fetus is less than the risk of continuing the pregnancy (Bowes & Thorp, 2004). Two thirds of the inductions in the United States are elective (i.e., for the convenience of the woman or the health care practitioner) (Ramsey, Ramin, & Ramin, 2000).

Both chemical and mechanical methods are used to induce labor. Intravenous oxytocin and amniotomy are the most common methods used in the United States. Prostaglandins are increasingly used for inducing labor. The most effective protocol (e.g., dose, frequency) to follow when using prostaglandins continues to be investigated (Simpson, 2002; Simpson & Atterbury, 2003). Less commonly used methods include stripping of membranes, nipple stimulation (manual or with a breast pump), and acupuncture (Bowes & Thorp, 2004). The ingestion of a laxative (e.g., castor oil), herbal preparations (e.g., green, chamomile, or raspberry tea; blue or black cohosh), or spicy food and administration of a soapsuds enema are other methods (Simpson, 2002). Many folk beliefs exist regarding methods to induce labor. These methods include activity (e.g., walking, exercise, strenuous work, intercourse), fasting, and increasing stress (e.g., frightening the woman). It is important for the nurse to know the practices a woman may believe in and follow, because some of these methods can be harmful (e.g., strenuous activity) (Schaffir, 2002). Success rates for induction of labor are higher when the condition of the cervix is favorable, or inducible. A rating system such as the Bishop score (Table 24-3) can be used to evaluate inducibility. For example, a score of 9 or more on this 13-point scale indicates that the cervix is soft, anterior, 50% or more effaced, and dilated 2 cm or more; and that the presenting part is engaged. Induction of labor is likely to be more successful if the score is 9 or more for nulliparas and 5 or more for multiparas (Gilbert & Harmon, 2003).

**Cervical ripening methods**

**Chemical agents.** A prostaglandin E2 gel (a cervical ripening agent) was approved by the FDA in 1993. Preparations of prostaglandin E2 and prostaglandin E1 can be used before induction to “ripen” (soften and thin) the cervix (Medication Guides). This treatment usually results in a

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<thead>
<tr>
<th>TABLE 24-3</th>
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<tbody>
<tr>
<td><strong>Bishop Score</strong></td>
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<tr>
<td><strong>Score</strong></td>
</tr>
<tr>
<td><strong>Dilation (cm)</strong></td>
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<tr>
<td><strong>Effacement (%)</strong></td>
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<tr>
<td><strong>Station (cm)</strong></td>
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<tr>
<td><strong>Cervical consistency</strong></td>
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<td><strong>Cervix position</strong></td>
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**GUIDELINES/GUÍAS: Induction of Labor**

- Your labor is not progressing.
- Su trabajo de parto no está progresando.
- We need to stimulate the contractions.
- Necesitamos provocar las contracciones.
- I’m going to give you some medication to make your contractions stronger.
- Le voy a dar una medicina para hacer más fuertes las contracciones.
- I’m going to give you Pitocin through your intravenous line.
- Le voy a dar Pitocin por medio del suero.
- Su trabajo de parto no está progresando.
- Le voy a dar pitufina por medio del suero.
higher success rate for the induction of labor, the need for lower dosages of oxytocin during the induction, and shorter induction times. The use of prostaglandins to increase cervical readiness for induction of labor is a beneficial form of cervical ripening or induction of labor, signs of labor or impending labor, and the Bishop score. Recognize that a nonreassuring FHR pattern; maternal fever, infection, vaginal bleeding, or hypersensitivity; and regular, progressive uterine contractions contraindicate the use of misoprostol.

Use caution if the woman has a history of asthma, glaucoma, or renal, hepatic, or cardiovascular disorders.

Have woman void before procedure. 

Assist woman to maintain a supine position with lateral tilt or a side-lying position for 30 to 40 minutes after insertion.

Prepare to swab vagina to remove unabsorbed medication using a saline-soaked gauze wrapped around fingers and to administer terbutaline 0.25 mg subcutaneously or intravenously if significant adverse reactions occur.

Initiate oxytocin for induction of labor no sooner than 4 hours after last dose of misoprostol was administered, following agency protocol, if ripening has occurred and labor has not begun.

Document all assessment findings and administration procedures.

Not recommended for use if woman has had previous cesarean birth or if she has a uterine scar.

Misoprostol (Cytotec) has not yet been approved by the FDA for cervical ripening or labor induction.

**Mechanical methods.** Mechanical dilators ripen the cervix by stimulating the release of endogenous prostaglandins. Their use is a form of care with a trade-off between beneficial and adverse effects (Enkin et al., 2000). Balloon catheters (e.g., Foley catheter) can be inserted into the intracervical canal to open and dilate the cervix. Hydroscopic dilators (substances that absorb fluid from surrounding tissues and then enlarge) also can be used for cervical ripening. Laminaria tents (natural cervical dilators made from desiccated seaweed) and synthetic dilators containing magnesium sulfate (Lamicel) are inserted into the endocervix without rupturing the membranes. As they absorb fluid, they expand and cause cervical dilation. These dilators are left in place for 6 to 12 hours before being removed to assess cervical dilation. Fresh dilators are inserted if further cervical dilation is necessary. Synthetic dilators swell faster than natural dilators and become larger with less discomfort (Simpson, 2002). Amniotomy and membrane stripping also can be used to open the cervix (Norwitz, Robinson, & Repke, 2002).

**Amniotomy.** Amniotomy (i.e., artificial rupture of membranes [AROM]) can be used to induce labor when the condition of the cervix is favorable (ripe) or to augment labor if progress begins to slow. Labor usually begins within 12 hours of the rupture. However, if amniotomy does not stimulate labor, the resulting prolonged rupture may lead to infection. Other potential risks include umbilical cord pro-
The color, odor, and consistency of the fluid is assessed (i.e., instrument, and the amniotic fluid is allowed to drain slowly. Brains are ruptured with an Amnihook or other sharp instrument is inserted through the vagina and may experience some discomfort when the Amnihook or the membranes is painless for her and the fetus, although she may experience some discomfort when the Amnihook or other sharp instrument is inserted through the vagina and cervix (Procedure box).

The presenting part of the fetus should be engaged and cleansed, are implemented. Fetal tachycardia (Simpson, 2002). Comfort measures, such as compression or prolapse.

Before the procedure, the woman should be told what to expect; she also should be assured that the actual rupture of the membranes is painless for her and the fetus, although she may experience some discomfort when the Amnihook or other sharp instrument is inserted through the vagina and cervix (Procedure box).

The presenting part of the fetus should be engaged and well applied to the cervix to prevent cord prolapse. The woman should be free of active infection of the genital tract (e.g., herpes) and human immunodeficiency virus (HIV) infection (Norwitz, Robinson, & Repke, 2002). The membranes are ruptured with an Amnihook or other sharp instrument, and the amniotic fluid is allowed to drain slowly. The color, odor, and consistency of the fluid is assessed (i.e., for the presence or absence of meconium or blood). The time of rupture is recorded.

NURSE ALERT The FHR is assessed before and immediately after the amniotomy to detect any changes (e.g., transient tachycardia is common, but bradycardia and variable decelerations are not) that may indicate cord compression or prolapse.

The woman’s temperature should be checked at least every 2 hours to rule out possible infection. If her temperature is 38° C or higher, the primary health care provider should be notified. The nurse assesses for other signs and symptoms of infection, such as maternal chills, uterine tenderness on palpation, foul-smelling vaginal drainage, and fetal tachycardia (Simpson, 2002). Comfort measures, such as frequently changing the woman’s underpads and perineal cleansing, are implemented.

Medication Guide

Cervical Ripening Using Prostaglandin E2 (PGE2): Dinoprostone (Cervidil Insert; Prepidil Gel)

ACTION
- PGE2 ripens the cervix, making it softer and causing it to begin to dilate and efface; stimulates uterine contractions.

INDICATIONS
- PGE2 is used for preinduction cervical ripening (ripening of cervix before oxytocin induction of labor when the Bishop score is 4 or less) and for induction of labor or abortion (abortal agent).

DOSEAGE
Cervidil Insert
- Dosage is 10 mg of dinoprostone designed to be released gradually (approximately 0.3 mg/hr) over 12 hr. Insert is placed transversely into the posterior fornix of vagina. The insert is removed at the onset of active labor or after 12 hours.

Prepidil Gel
- Dosage is 0.5 mg dinoprostone in 2.5-ml syringe. Gel is administered through a catheter attached to the syringe into the cervical canal just below the internal cervical os. Dose may be repeated every 6 hr as needed for cervical ripening up to a maximum of 1.5 mg in a 24-hr period.

ADVERSE REACTIONS
- Potential adverse reactions include headache, nausea and vomiting, diarrhea, fever, hypotension, tachysystole (12 or more uterine contractions in 20 minutes without alteration of fetal heart rate [FHR] pattern), hyperstimulation of the uterus (tachysystole with nonreassuring FHR pattern), or fetal passage of meconium.

NURSING CONSIDERATIONS
- Explain procedure to woman and her family. Ensure that an informed consent has been obtained as per agency policy.
- Assess maternal-fetal unit before each insertion and during treatment following agency protocol for frequency. Assess maternal vital signs and health status, FHR pattern, and status of pregnancy, including indications for cervical ripening or induction of labor, signs of labor or impending labor, and the Bishop score. Recognize that a nonreassuring FHR pattern; maternal fever, infection, vaginal bleeding, or hypersensitivity; and regular, progressive uterine contractions contraindicate the use of dinoprostone.
- Use caution if the woman has a history of asthma; glaucoma; or renal, hepatic, or cardiovascular disorders.
- Bring gel to room temperature before administration. Do not force warming process by using a warm water bath or other source of external heat (e.g., microwave).
- Keep insert frozen until immediately before use; no need to wash.
- Have woman void before insertion.
- Assist woman to maintain a supine position with lateral tilt or a side-lying position for 15 to 30 min after insertion of gel or for 2 hr after placement of insert.
- Prepare to swab vagina to remove remaining gel using a saline-soaked gauze, or pull string to remove insert and to administer terbutaline 0.25 mg subcutaneously or intravenously if significant adverse reactions occur.
- Initiate oxytocin for induction of labor within 6 to 12 hr after last instillation of gel or within 30 min after removal of the insert or follow agency protocol for induction if ripening has occurred and labor has not begun.
- Document all assessment findings and administration procedures.
- Not recommended for use if woman has had previous cesarean birth or if she has a uterus scar.
- Dinoprostone is the only FDA-approved medication for cervical ripening or labor induction.
Oxytocin is a hormone normally produced by the posterior pituitary gland; it stimulates uterine contractions. Synthetic oxytocin may be used either to induce labor or to augment a labor that is progressing slowly because of inadequate uterine contractions.

The indications for oxytocin induction or augmentation of labor may include, but are not limited to, the following:

- Suspected fetal jeopardy (e.g., IUGR)
- Inadequate uterine contractions; dystocia
- PROM
- Postterm pregnancy
- Chorioamnionitis
- Maternal medical problems (e.g., woman with severe Rh isoimmunization, inadequately controlled diabetes mellitus, chronic renal disease, or chronic pulmonary disease)
- Severe preeclampsia
- Fetal death
- Multiparous women with a history of precipitous labor or who live far from the hospital

The management of stimulation of labor is the same regardless of the indication. Because of the potential dangers associated with the injection of oxytocin in the prenatal and intrapartal periods, the FDA has issued certain restrictions to its use.

Contraindications to oxytocin stimulation of labor include, but are not limited to, the following:

- Nonreassuring fetal status
- Placenta previa or vasa previa
- Prior classic uterine incision or uterine surgery
- Active genital herpes infection
- Certain maternal and fetal conditions, although not contraindications to the use of oxytocin to stimulate labor, do require special caution during its administration. These conditions include the following:
  - Multifetal presentation
  - Breech presentation
  - Presenting part above the pelvic inlet
  - Abnormal fetal heart pattern not requiring emergency birth
  - Polyhydramnios
  - Grand multiparity
  - Maternal cardiac disease; hypertension

Oxytocin use can present hazards to the mother and fetus. These hazards are primarily dose related, with most problems caused by high doses that are given rapidly. Maternal hazards include water intoxication and tumultuous labor with tetanic contractions, which may cause premature separation of the placenta, rupture of the uterus, lacerations of the cervix, or postpartum hemorrhage. These complications can lead to infection, disseminated intravascular coagulation, or amniotic fluid embolism. Women may become anxious or fearful if the induction is not successful because they may then have concerns about the method of birth.

Uterine hyperstimulation reduces the blood flow through the placenta and results in FHR decelerations (bradycardia, diminished variability, late decelerations), fetal asphyxia, and neonatal hypoxia. If the estimated date of birth is inaccurate, physical injury, neonatal hyperbilirubinemia, and prematurity are other hazards.

The primary health care provider orders induction or augmentation of labor with oxytocin. The nurse implements the order by initiating the primary intravenous infusion and administering the oxytocin solution through a secondary line. The nurse’s actions related to assessment and care of a woman whose labor is being induced are guided by hos-
A commonly recommended initial dosage is 0.5 to 1 milliunits/min with increments of 1 or 2 milliunits/min every 30 to 60 minutes because 30 to 40 minutes is required for a steady state of oxytocin to be reached and for the full effect of a dosage increment to be reflected in more intense, frequent, and longer contractions (Simpson & Atterbury, 2003). Such an approach reduces the amount of oxytocin required to achieve a spontaneous vaginal birth and decreases the risk for uterine hyperstimulation, dysfunctional labor, fetal distress, and other adverse reactions such as water intoxication (Norwitz, Robinson, & Repke, 2002; Simpson, 2002).

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**Nursing considerations.** An evidence-based written protocol for the preparation and administration of oxytocin should be established by the obstetric department (physicians, nurses) in each institution (see Box 24-8).

**NURSE ALERT** Oxytocin is discontinued immediately and the primary health care provider notified if uterine hyperstimulation, nonreassuring FHR and pattern, or both occur.

Other nursing interventions, such as administering oxygen by face mask, positioning the woman on her side, and infusing more intravenous fluids are implemented immediately (Emergency box). Based on the status of the protocol and professional standards (Fig. 24-7; Box 24-8).

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**BOX 24-8**

**Protocol: Induction of Labor with Oxytocin**

**PATIENT AND FAMILY TEACHING**

Explain technique, rationale, and reactions to expect:
- Route and rate for administration of medication
- What “piggyback” (Secondary intravenous line inserted into primary intravenous line) for
- Reasons for use:
  - Induce labor, improve labor
  - Reactions to expect concerning the nature of contractions: intensity of contraction increases more rapidly, holds the peak longer, and ends more quickly; contractions will come regularly and more often
- Monitoring to anticipate:
  - Maternal: blood pressure, pulse, uterine contractions, uterine tone
  - Fetal: heart rate, activity
- Success to expect: a favorable outcome will depend on inducibility of the cervix (e.g., Bishop score of 9 for a primipara)
- Keep woman and support person informed of progress

**ADMINISTRATION**

Position woman in side-lying or upright position
Assess status of maternal fetal unit
Prepare solutions and administer with pump delivery system according to prescribed orders:
- Infusion pump and solution are set up (e.g., 10 units/1000 ml isotonic electrolyte solution)
- Piggyback solution is connected to IV line at proximal port
- Solution with oxytocin is flagged with a medication label
- Begin induction at 0.5 to 2 milliunits/min
- Increase dose 1 to 2 milliunits/min at intervals of 15 to 60 minutes until a dose of up to 20 to 40 milliunits/min is reached

**MAINTAIN DOSE IF**

- Intensity of contractions results in intrauterine pressures of 40 to 90 mm Hg (shown by internal monitor)
- Duration of contractions is 40 to 90 seconds
- Frequency of contractions is 2- to 3-minute intervals
- Cervical dilation of 1 cm/hr occurs in the active phase

**MATERIALS AND FETAL ASSESSMENTS**

- Measure blood pressure, pulse, and respirations every 30 to 60 minutes and with every increment in dose
- Monitor contraction pattern and uterine resting tone every 15 minutes and with every increment in dose
- Assess intake and output; limit IV intake to 1000 ml/8 hr; output should be 120 ml or more every 4 hours
- Perform vaginal examination as indicated
- Monitor for nausea, vomiting, headache, hypotension
- Assess fetal status using electronic fetal monitoring; evaluate tracing every 15 minutes and with every increment in dose
- Observe emotional responses of woman and her partner

**REPORTABLE CONDITIONS**

- Uterine hyperstimulation
- Nonreassuring FHR pattern
- Suspected uterine rupture
- Inadequate uterine response at 20 milliunits/min

**EMERGENCY MEASURES**

Discontinue use of oxytocin per hospital protocol:
- Turn woman on her side
- Increase primary IV rate up to 200 ml/hr, unless patient has water intoxication, in which case, the rate is decreased to one that keeps the vein open
- Give woman oxygen by face mask at 8 to 10 L/min or per protocol or physician’s or nurse-midwife’s order

**DOCUMENTATION**

- Medication: kind, amount, time of beginning, increasing dose, maintaining dose, and discontinuing medication in patient record and on monitor strip
- Reactions of mother and fetus
- Pattern of labor
- Progress of labor
- FHR and pattern
- Maternal vital signs
- Nursing interventions and woman’s response
- Notification of physician or nurse-midwife


FHR: Fetal heart rate; IV: Intravenous.
the aggressive use of oxytocin so that the woman gives birth is, the augmentation of labor to establish efficient labor with oxytocin; protocols for dosage and frequency of oxytocin use during labor with oxytocin are similar to those used for induction of labor. Changes, relaxation measures, nourishment and hydration, such as emptying the bladder, ambulation and position changes, relaxation measures, nourishment and hydration, and hydrotherapy should be attempted before invasive interventions are initiated. The administration procedure and nursing assessment and care measures for augmentation of labor with oxytocin are similar to those used for induction of labor with oxytocin; protocols for dosage and frequency of increments may vary (e.g., lower dosages may be needed to achieve spontaneous vaginal birth (Gilbert & Harmon, 2003; Simpson, 2002).

Some physicians advocate active management of labor, that is, the augmentation of labor to establish efficient labor with the aggressive use of oxytocin so that the woman gives birth within 12 hours of admission to the labor unit. Advocates of active management believe that intervening early (as soon as a nulliparous labor is not progressing at least 1 cm/hr) with use of higher pharmacologic oxytocin doses administered at frequent increment intervals (e.g., a starting dose of 6 milliunits/min with increases of 6 milliunits/min every 15 minutes to a maximum dose of 40 milliunits/min) shortens labor and is associated with a lower incidence of cesarean birth (Norwitz, Robinson, & Repke, 2002; Simpson, 2002). Additional components of the active management of labor include strict criteria to diagnose that the woman is in active labor with 100% effacement, amniotomy within 1 hour of admission of a woman in labor if spontaneous rupture of the membranes has not occurred, and continuous presence of a personal nurse who provides one-on-one care for the woman while she is in labor. When all components are fully implemented, active management of labor is associated with a lower incidence of cesarean birth. Active management of labor continues to be under study in the United States to determine effectiveness and impact on perinatal morbidity and mortality. Thus far, results have been disappointing, especially in terms of reducing the rate of cesarean births. The disappointing results have been attributed in part to a greater than one-to-one nurse-patient ratio and the high rate of epidural anesthesia. It is considered to be a form of care of unknown effectiveness (Enkin et al., 2000; Gilbert & Harmon, 2003).

**Forceps-assisted birth**

A forceps-assisted birth is one in which an instrument with two curved blades is used to assist in the birth of the fetal head. The cephalic-like curve of the forceps commonly used is similar to the shape of the fetal head, with a pelvic curve to the blade conforming to the curve of the pelvic axis. The blades are joined by a pin, screw, or groove arrangement. These locks prevent the forceps from compressing the fetal skull. Maternal indications for forceps-assisted birth include the need to shorten the second stage of labor in the event of dystocia or to compensate for the woman’s deficient expulsive efforts (e.g., if she is tired or has been given spinal or epidural anesthesia), or to reverse a dangerous condition (e.g., cardiac decompensation).

Fetal indications include birth of a fetus in distress or in certain abnormal presentations; arrest of rotation; or delivery of the head in a breech presentation. The use of forceps during childbirth has been decreasing. In 2002, forceps or vacuum were used to assist 5.9% of births (Martin et al., 2003). Certain conditions are required for a forceps-assisted birth to be successful. The woman’s cervix must be fully dilated to avert lacerations and hemorrhage. The bladder should be empty. The presenting part must be engaged, and a vertex presentation is desired. Membranes must be ruptured so that the position of the fetal head can be determined and the forceps can firmly grasp the head during birth (Fig. 24-8). In addition, CPD should not be present.

**Nursing considerations.** When a forceps-assisted birth is deemed necessary, the nurse obtains the type of maternal-fetal unit, the primary health care provider may order that the infusion be restarted once the FHR and uterine activity return to acceptable levels. Depending on the length of time the infusion was discontinued, the induction may be restarted at half the rate that resulted in hyperstimulation (e.g., discontinued for 10 to 20 minutes) or at the same rate as the initial rate (e.g., discontinued for more than 30 to 40 minutes) (Simpson, 2002) (Plan of Care: Dysfunction (e.g., cardiac decompensation).

**FHR** Fetal heart rate, IV intravenous.
of forceps requested by the primary health care provider. The nurse may explain to the mother that the forceps blades fit like two tablespoons around an egg, with the blades placed in front of the baby’s ears. The nurse usually coaches the woman not to push during contractions unless the primary health care provider instructs the woman to push as traction is being applied during contractions.

**NURSE ALERT** Because compression of the cord between the fetal head and the forceps will cause a decrease in FHR, the FHR and pattern are assessed, reported, and recorded before and after application of the forceps.

If a decrease in FHR occurs, the primary health care provider removes and reapplies the forceps. After birth the mother is assessed for vaginal and cervical lacerations (e.g., bleeding that occurs even with a contracted uterus), urine retention, which may result from bladder or urethral injuries; and hematoma formation in the pelvic soft tissues, which may result from blood vessel damage. The infant should be assessed for bruising or abrasions at the site of the blade applications, facial palsy resulting from pressure of the blades...
on the facial nerve (cranial nerve VII), and subdural hematoma. Newborn and postpartum caregivers should be warned that a forceps-assisted birth was performed.

Vacuum-assisted Birth

Vacuum-assisted birth, or vacuum extraction, is a birth method involving the attachment of a vacuum cup to the fetal head, using negative pressure to assist in the birth of the head. Indications and prerequisites for its use are similar to those for outlet forceps. It is usually not used to assist birth before 34 weeks of gestation (Cunningham et al., 2005). When an operative vaginal birth is required, vacuum assistance is preferred as a beneficial form of care when compared with forceps assistance (Enkin et al., 2000).

When the birth is to be vacuum assisted, the woman is prepared for a vaginal birth in the lithotomy position to allow sufficient traction. The cup is applied to the fetal head, and a caput develops inside the cup as the pressure is initiated (Fig. 24-9). Traction is applied to facilitate descent of the fetal head, and the woman is encouraged to push as suction is applied. As the head crowns, an episiotomy is performed if necessary. The vacuum cup is released and removed after birth of the head. If vacuum extraction is not successful, a cesarean birth is usually performed.

Risks to the newborn include cephalhematoma, scalp lacerations, and subdural hematoma. Fetal complications can be reduced by strict adherence to the manufacturer’s recommendations for method of application, degree of suction, and duration of application. Maternal complications are uncommon but can include perineal, vaginal, or cervical lacerations and soft-tissue hematomas.

Nursing considerations. The nurse’s role for the woman who has a vacuum-assisted birth is one of support person and educator. The nurse can prepare the woman for birth and encourage her to remain active in the birth process by pushing during contractions. The FHR should be assessed frequently during the procedure. After birth, the newborn should be observed for signs of trauma and infection at the application site and for cerebral irritation (e.g., poor sucking or listlessness). The newborn may be at risk for neonatal jaundice as bruising resolves. The parents may need to be reassured that the caput succedaneum will begin to disappear in a few hours. Neonatal caregivers should be told that the birth was vacuum assisted.

Cesarean birth

Cesarean birth is the birth of a fetus through a transabdominal incision in the uterus. Whether cesarean birth is planned (scheduled) or unplanned (emergency), the loss of the experience of giving birth to a child in the traditional manner may have a negative effect on a woman’s self-concept. An effort is therefore made to maintain the focus on the birth of a child rather than on the operative procedure.

The purpose of cesarean birth is to preserve the life or health of the mother and her fetus; it may be the best choice for birth when there is evidence of maternal or fetal complications. Since the advent of modern surgical methods and care and the use of antibiotics, maternal and fetal morbidity and mortality have decreased. In addition, incisions are made in the lower uterine segment rather than in the muscular body of the uterus and thus more effective healing...
is promoted. However, despite these advances, cesarean birth still poses threats to the health of the mother and infant.

The incidence of cesarean births increased to 27.6% in 2003, the highest rate ever reported in the United States, with the primary cesarean birth rate at 19.1% (Hamilton et al., 2004). In Canada the rate was 22.1% in 2001 (Liu et al., 2004). Factors cited in this increase include use of electronic fetal monitoring and epidural anesthesia; an increase in the number of first-time pregnancies, as well as the number of pregnancies at an older age; and the decline in the rate of vaginal birth after cesarean (VBAC) (10.6% in 2003 in the United States; 28.5% in 2001 in Canada) (Hamilton et al., 2004; Liu et al., 2004). Women 35 to 39 years of age have a cesarean birth rate of 33%, and those 40 to 54 years of age have a rate of 40.7%, over twice the rate for teenage women (18%) (Martin et al., 2003).

Women who have private insurance, who are of a higher socioeconomic status, or who give birth in a private hospital (Gilbert & Harmon, 2003; Moore, 2003) or who receive public assistance (e.g., Medicaid), or who give birth in a public hospital (Gilbert & Harmon, 2003; Moore, 2003) are more likely to experience cesarean birth than are women who are poor, who have no insurance, who are receiving public assistance (e.g., Medicaid), or who give birth to a cesarean birth are related to labor and birth complications. The complications most closely associated with cesarean birth include CPD, malpresentations such as breech and shoulder, placental abnormalities (e.g., previa, abruptio), dysfunctional labor, and maternal and fetal complications such as diabetes, hypertension, malpresentation, amniotic fluid volume, placental abnormalities (e.g., previa, abruptio), dysfunctional labor, and maternal and fetal complications such as diabetes, hypertension, and antepartum hemorrhage.

The labor management approach that most consistently reduced cesarean birth rates was one-to-one support of the laboring woman by another woman such as a nurse, midwife, or doula (Hodnett, Gates, Hofmeyr, & Sakala, 2003; Hodnett et al., 2002). Approaches for the management of labor and birth to reduce the rate of cesarean births while increasing the rate of VBAC are presented in Box 24-9. However, the rate of VBAC is decreasing. This decline may be a result of reports of risks of VBAC, legal pressures, conservative practice guidelines, and debate regarding the relative benefits and risks of the cesarean versus the vaginal route for births (Martin et al., 2003).

The type of nursing care given also may influence the rate of cesarean births. A labor management approach that uses one-to-one support and emphasizes ambulation, maternal position changes, relaxation measures, oral fluids and nutrition, hydrotherapy, and nonpharmacologic pain relief facilitates the progress of labor and reduces the incidence of dystocia (AWHONN, 2000; Hodnett, 2002; Milner, 2002).

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**Indications.** Few absolute indications exist for cesarean birth. Today most are performed primarily for the benefit of the fetus. The most common indications for cesarean birth are related to labor and birth complications. The complications most closely associated with cesarean birth include CPD, malpresentations such as breech and shoulder, placental abnormalities (e.g., previa, abruptio), dysfunctional laboratory and birth complications.

**Box 24-9**

**Selected Measures to Reduce Cesarean Birth Rate and Increase Rate of Vaginal Birth after Cesarean**

**Educate Women Regarding**
- Advantages and safety of the home environment for early or latent labor
- Indicators for hospital admission
- Management techniques to use during labor to enhance progress
- Nonpharmacologic measures to reduce pain and discomfort and enhance relaxation
- Safety and effectiveness of TOL and VBAC

**Establish Admission Criteria for Women in Labor**
- Distinguish clinical manifestations for false labor, latent or early labor, and active labor
- Conduct admission assessments in a separate admissions area
- Send women in false or early or latent labor home or keep them in the admissions area
- Admit women in active labor to the labor and birth unit

**Use Appropriate Assessment Techniques to**
- Determine status of the maternal-fetal unit
- Establish an individualized rationale for initiating labor interventions such as epidural anesthesia, induction or augmentation, amniotomy, cesarean birth

**Initiate a Doula Program That**
- Provides one-to-one support for women in labor

**Develop a Philosophy of Labor Management That**
- Schedules admission during active labor
- Avoids automatic interventions such as routine induction for spontaneous rupture of membranes at term or post-term pregnancy and cesarean birth for breech presentation, twin gestation, fetal distress, or failure to progress
- Relies on assessment findings reflective of the status of the maternal-fetal unit rather than strict adherence to set ranges for the duration of the stages and phases of labor
- Employs intermittent rather than continuous electronic fetal monitoring of low risk pregnant women
- Focuses on measures that are known to enhance the progress of labor such as upright positions, frequent position changes, ambulation, oral nutrition and hydration, relaxation techniques, hydrotherapy
- Emphasizes nonpharmacologic measures to relieve pain
- Uses nonpharmacologic measures in a manner that reduces their labor-inhibiting effects
- Establishes criteria for elective cesarean birth and TOL
- Encourages women who have had a previous cesarean birth to participate in TOL to attempt a vaginal birth

**TOL**, trial of labor; **VBAC**, vaginal birth after cesarean.
Labor pattern, umbilical cord prolapse, fetal distress, and multiple gestation (see Evidence-Based Practice Box) on p. 787. Medical risk factors most closely associated with cesarean birth include hypertensive disorders, active genital herpes, positive HIV status, and diabetes (Martin et al., 2003).

**Elective cesarean birth.** Women are requesting cesarean births for reasons other than medical, obstetric, or fetal indications. These reasons include the belief that the surgery will prevent future problems with pelvic support or sexual dysfunction and the convenience of planning a date or having control and choice about when to give birth (Williams, 2005). Some multiparous women may request a cesarean after a previous traumatic vaginal birth or psychologic trauma (Gardner, 2003). In a committee opinion ACOG notes that the right of patients to refuse surgery is well known (ACOG, 2003). It is less clear if they have the right to ask for surgery. The Society of Obstetricians and Gynecologists of Canada (SOGC) promotes natural childbirth, does not promote elective cesarean birth but believes that the final decision as to the safest route for childbirth rests with the woman and her health care provider (SOGC, 2004). It is essential that women are fully informed about the risks and benefits of cesarean birth when they consider the request for elective cesarean (McFarlin, 2004).

**Forced cesarean birth.** A woman’s refusal to undergo cesarean birth when indicated for fetal reasons is often described as a maternal-fetal conflict. Health care providers are ethically obliged to protect the well-being of both the mother and the fetus; a decision for one affects the other. If a woman refuses a cesarean birth that is recommended because of fetal jeopardy, health care providers must make every effort to find out why she is refusing and provide information that may persuade her to change her mind. If the woman continues to refuse surgery, then health care providers must decide if it is ethical to get a court order for the surgery; however, every effort should be made to avoid this legal step.

**Surgical techniques.** The two main types of cesarean operation are the classic and the lower-segment cesarean incisions. Classic cesarean birth is rarely performed today, although it may be used when rapid birth is necessary and in some cases of shoulder presentation and placenta previa. The incision is made vertically into the upper body of the uterus (Fig. 24-10, A). Because the procedure is associated with a higher incidence of blood loss, infection, and uterine rupture in subsequent pregnancies than is lower-segment cesarean birth, vaginal birth after a classic cesarean birth is contraindicated.

Lower-segment cesarean birth can be achieved through a vertical or transverse incision into the uterus (Fig. 24-10, B and C). The transverse incision is more popular, however, because it is easier to perform, is associated with less blood loss and fewer postoperative infections, and is less likely to rupture in subsequent pregnancies (Bowes & Thorp, 2004).

**Complications and risks.** Maternal complications of cesarean births include aspiration, pulmonary embolism, wound infection, wound dehiscence, thrombophlebitis, hemorrhage, uterine tract infection, injuries to the bladder or bowel, and complications related to anesthuesia. The fetus may be born prematurely if the gestational age has not been accurately determined; fetal injuries can occur during the surgery (Bowes & Thorp, 2004). Besides these risks, the woman is at economic risk because the cost of cesarean birth is higher than that of vaginal birth, and a longer recovery period may require additional expenditures.

Many women who have a cesarean birth speak of having feelings that interfere with their maintaining an adequate self-concept. These feelings include fear, disappointment, frustration at losing control, anger (the “why me” syndrome), and loss of self-esteem related to a change in body image and perceived inability to give birth as they had expected and hoped. Often women experience a delay in their ability to interact with their newborns after birth. These women are less likely to breastfeed and may even have some difficulty expressing positive feelings about their newborns for some time after birth. They are often less satisfied with their childbirth experience and report more fatigue and poor physical functioning during the first few weeks after discharge. Success at mothering and in the recovery process can do much
to restore the self-esteem of these women. Some women see the scar as mutilating, and worries concerning sexual attrac-
tiveness may surface. Some men are fearful of resuming in-
tercourse because of the fear of hurting their partners. Par-
ents may wonder if a cesarean birth was absolutely necessary, and
such feelings may surface even years later. They should there-
fore be given opportunities to discuss the experience to
try to understand and resolve concerns after the birth.

Anesthesia. Spinal, epidural, and general anesthet-
ics are used for cesarean births. Epidural blocks are popular
because women want to be awake for and aware of the birth
experience. However, the choice of anesthetic depends on
several factors. The mother’s medical history or present con-
dition, such as a spinal injury, hemorrhage, or coagulopathy,
may rule out the use of regional anesthesia. Time is another
factor, especially if there is an emergency and the life of the
mother or infant is at stake. In such a case, general anesthesia
will most likely be used unless the woman already has an
epidural block in effect. The woman herself is a factor. Ei-
ther she may not know all the options or may have fears
about having “a needle in her back” or about being awake
and feeling pain. She needs to be fully informed about the
risks and benefits of the different types of anesthesia so that
she can participate in the decision whenever there is a choice.

Scheduled cesarean birth. Cesarean birth is
scheduled or planned if labor and vaginal birth are con-
traindicated (e.g., complete placenta previa, active genital
herpes, positive HIV status), if birth is necessary but labor
is not inducible (e.g., hypertensive states that cause a poor
intrauterine environment that threatens the fetus), or if this
has been decided on by the primary health care provider and
the woman (e.g., a repeat cesarean birth).

Women who are scheduled to have a cesarean birth have
time to prepare for it psychologically. However, the psy-
chologic responses of these women may differ. Those hav-
ing a repeat cesarean birth may have disturbing memories of
the conditions preceding the initial surgical birth (primary
cesarean birth) and of their experiences in the postoperative
recovery period. They may be concerned about the added
burdens of caring for an infant and perhaps other children
while recovering from a surgical operation. Others may feel
glad that they have been relieved of the uncertainty about
the date and time of the birth and are free of the pain of labor.

Unplanned cesarean birth. The psychosocial
outcomes of unplanned or emergency cesarean birth are
usually more pronounced and negative when compared with the
outcomes associated with a scheduled or planned ce-
parean birth. Women and their families experience abrupt
changes in their expectations for birth, postbirth care, and
the care of the new baby at home. This may be an extremely
traumatic experience for all.

The woman usually approaches the procedure tired and
discouraged after an ineffective and difficult labor. Fear pre-
dominates as she worries about her own safety and well-
being and that of her fetus. She may be dehydrated, with low
glycogen reserves. Because preoperative procedures must be
done quickly and competently, the time for explanation of
the procedures and operation is often short. Because ma-
ternal and family anxiety levels are high at this time, much
of what is said may be forgotten or misunderstood.

The woman may experience feelings of anger or guilt in the post-
partum period. Fatigue is often noticeable in these women,
and they need much supportive care.

After surgery, counseling strategies that have been im-
plemented by nurses include providing women with op-
portunities to talk about their birth experience, express their
feelings about what happened, have their questions an-
swered, address gaps in knowledge or understanding of
events, connect the event with emotions and behavior, and
talk about future pregnancies. More research is needed to de-
terminate how effective these strategies are for these women
in influencing their views about the unplanned cesarean
birth experience or about future pregnancies (Gamble & Creedy, 2004).

Prenatal preparation. Concerned professional and
lay groups in the community have established councils for
cesarean birth to meet the needs of these women and their
families. Such groups advocate that a discussion of cesarean
birth be included in all parenthood preparation classes. No
woman can be guaranteed a vaginal birth, even if she is in
good health and there is no indication of danger to the fe-
tus before the onset of labor. For this reason, every woman
needs to be aware of and prepared for this possibility.

Childbirth educators stress the importance of empha-
sizing the similarities and differences between a cesarean
and a vaginal birth. In support of the philosophy of family-
centered birth, many hospitals have instituted policies that
permit fathers and other partners and family members to share
in both the birth as it is done in vaginal ones. Women who
have undergone cesarean birth agree that the continued pres-
ce and support of their partners helped them respond pos-
nively to the entire experience. In addition to preparing
women for the possibility of cesarean birth, childbirth ed-
cucators should empower women to believe in their ability
to give birth vaginally and to seek care measures during la-
obor that will enhance the progress of their labors and reduce
their risk for cesarean birth.

Preoperative care. Family-centered care is the goal
for the woman who is to undergo cesarean birth and for her
family. The preparation of the woman for cesarean birth is
the same as that done for other elective or emergency sur-
gery. The primary health care provider discusses, with the
woman and her family, the need for the cesarean birth and
the prognosis for the mother and infant. The anesthesiolo-
gist assesses the woman’s cardiopulmonary system and de-
scribes the options for anesthesia. Informed consent is ob-
tained for the procedure (Guidelines/Guías: Cesarean Birth).

Blood and urine tests are usually done a day or two before
a planned cesarean birth or on admission to the labor and
birth unit. Laboratory tests, most commonly ordered to es-
tablish baseline data, include a complete blood cell count and
chemistry, blood typing and crossmatching, and urinalysis. Maternal vital signs and blood pressure and FHR and pattern continue to be assessed per the hospital routine until the operation begins. Physical preoperative preparation usually includes inserting a retention catheter to keep the bladder empty and administering prescribed preoperative medications. An abdominal-mons shave or a clipping of pubic hair may be ordered by the primary health care provider. In the event that general anesthesia will be used, an antacid, administered orally to neutralize gastric secretions in case of aspiration, is a beneficial form of care (Enkin et al., 2000). Intravenous fluids are started to maintain hydration and to provide an open line for the administration of blood or medications if needed.

Removal of dentures, nail polish, and jewelry may be optional, depending on hospital policies and type of anesthesia used. If the woman wears glasses and is going to be awake, the nurse should make sure her glasses accompany her to the operating room so she can see her infant. If the woman wears contact lenses, the nurse can find out whether they can be worn for the birth.

During the preoperative preparation, the support person is encouraged to remain with the woman as much as possible to provide continuing emotional support (if this action is culturally acceptable to the woman and support person). The nurse provides essential information about the preoperative procedures during this time. Although the nursing actions may be carried out quickly if a cesarean birth is unplanned, verbal communication, particularly explanation, is important. Silence can be frightening to the woman and her support person. The nurse’s use of touch can communicate feelings of care and concern for the woman. The nurse can assess the woman’s and her partner’s perceptions about cesarean birth (e.g., the woman feels that she is a failure because she did not have a vaginal birth). As the woman expresses her feelings, the nurse may identify a potential for a disturbance in self-concept during the postpartum period that may need to be addressed. If there is time before the birth, the nurse can teach the woman about postoperative...

**GUIDELINES/GUIAS**

Cesarean Birth—Informed Consent

- You need a cesarean.
- Necesita una operación cesárea.
- Has your doctor discussed with you the reason for needing a cesarean?
- ¿Ha hablado el doctor con usted sobre la necesidad de tener una operación cesárea?
- Do you understand why you need a cesarean?
- ¿Entiende usted por qué necesita una operación cesárea?
- Your signature on this form will allow us to proceed with the surgery.
- Su firma en este formulario nos permitirá seguir adelante con la operación.
- Please sign this consent form.
- Por favor, firme este formulario de autorización.

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Fig. 24-11 Cesarean birth. A, “Bikini” incision has been made, the muscle layer is separated, the abdomen is entered, and the uterus has been exposed and incised; suctioning of amniotic fluid continues as head is brought up through the incision. Note small amount of bleeding. B, The neonate’s birth through the uterine incision is nearly complete. C, A quick assessment is performed; note extreme molding of head resulting from cephalopelvic disproportion. (Courtesy Marjorie Pyle, RNC, Lifecircle, Costa Mesa, CA.)
expectations and about pain relief, turning, coughing, and deep-breathing measures.

**Intraoperative care.** Cesarean births occur in operating rooms in the surgical suite or in the labor and birth unit. Once the woman has been taken to the operating room, her care becomes the responsibility of the obstetric team, surgeon, anesthesiologist, pediatrician, and surgical nursing staff (Fig. 24-11). If possible, the partner, who is dressed appropriately for the operating room, accompanies the mother to the operating room and remains close to her so that continued support and comfort can be provided.

The nurse who is circulating may assist with positioning the woman on the birth (surgical) table. It is important to position her so that the uterus is displaced laterally to prevent compression of the inferior vena cava, which causes decreased placental perfusion. This is usually accomplished by placing a wedge under the hip. A Foley catheter is inserted into the bladder at this time if one is not already in place.

If the partner is not allowed or chooses not to be present, the nurse can stay in communication with him or her and give progress reports whenever possible. If the woman is awake during the birth, the nurse, anesthesiologist, or both can tell her what is happening and provide support. She may be anxious about the sensations she is experiencing, such as the coldness of solutions used to prepare the abdomen and pressure or pulling during the actual birth of the infant. She also may be apprehensive because of the bright lights or the presence of unfamiliar equipment and masked and gowned personnel in the room. Explanations by the nurse can help to decrease the woman’s anxiety.

Care of the infant usually is delegated to a pediatrician or a nurse team skilled in neonatal resuscitation, because these infants are considered to be at risk until there is evidence of physiologic stability after the birth.

A crib with resuscitation equipment is readied before surgery. Those responsible for care are expert not only in resuscitative techniques but also in their ability to detect normal and abnormal infant responses. After birth, if the infant’s condition permits and the mother is awake, the baby may be placed skin-to-skin on the mother or can be given to the woman’s partner to hold (Fig. 24-12). The infant whose condition is compromised is transported after initial stabilization to the nursery for observation and the implementation of appropriate interventions. In some institutions, the partner may accompany the infant; if not, personnel keep the family informed of the infant’s progress, and parent-infant contacts are initiated as soon as possible.

If the family cannot accompany the woman during surgery, the family is directed to the surgical or obstetric waiting room. The physician then reports on the condition of the mother and child to the family members after the birth is completed. Family members may accompany the infant as she or he is transferred to the nursery, giving them an opportunity to see and admire the new baby.

**LEGAL TIP** Disclosure of Patient Information

Some mothers or fathers want the privilege of informing family and friends of the sex of the infant (if it was not known before birth) or other information about the birth. Before responding to requests for such information from people waiting outside the birthing area, the nurse should check to see if the mother has given consent for such information to be released.

**Immediate postoperative care.** Once surgery is completed, the mother is transferred to a recovery room or back to her labor room. After a cesarean birth, women have both postoperative and postpartum needs that must be
addressed. They are surgical patients as well as new mothers. Nursing assessments in this immediate postbirth period follow agency protocol and include degree of recovery from the effects of anesthesia, postoperative and postbirth status, and degree of pain. A patent airway is maintained, and the woman is positioned to prevent possible aspiration. Vital signs are taken every 15 minutes for 1 to 2 hours or until stable. The condition of the incisional dressing, the fundus, and the amount of lochia are assessed, as well as the intravenous intake and the urine output through the Foley catheter. The woman is helped to turn and do coughing, deep-breathing, and leg exercises. Medications to relieve pain may be administered.

If the baby is present, the mother and her partner are given some time alone with him or her to facilitate bonding and attachment. Breastfeeding can be initiated if the mother feels like trying. If the woman is in a recovery area or in her labor room, the usually is transferred to the postpartum unit after 1 to 2 hours or once her condition is stable and the effects of anesthesia have worn off (i.e., she is alert, oriented, and able to feel and move extremities) (Care Path).

**Postoperative or postpartum care.** The attitude of the nurse and other health team members can influence the woman’s perception of herself after a cesarean birth. The caregivers should stress that the woman is a new mother first and a surgical patient second. This attitude helps the woman perceive herself as having the same problems and needs as other new mothers, while requiring supportive postoperative care.

The women’s physiologic concerns for the first few days may be dominated by pain at the incision site and pain resulting from intestinal gas, and hence the need for pain relief. If epidural anesthesia was used for the surgery, epidural opioids can be given in the immediate postoperative period to provide pain relief for approximately 24 hours. Otherwise, pain medications usually are given every 3 to 4 hours, or patient-controlled analgesia may be ordered instead. Other comfort measures such as position changes, splinting of the incision with pillows, and relaxation and breathing techniques (e.g., those learned in childbirth classes) may be implemented. Women are often the best judges of what their bodies need and can tolerate, including the postoperative ingestion of foods and fluids. If desired by the woman, the early introduction of solid food is safe. Women who eat early have been found to require less analgesia, and gastrointestinal problems do not occur (Abrams, Minastan, & Pidrett, 2004). Ambulation and rocking in a rocking chair may relieve gas pains, and avoiding the consumption of gas-forming foods and carbonated beverages may help minimize them.

Nurses must be alert to a woman’s physiologic needs, managing care to ensure adequate rest and pain relief. Mother-baby care (couplet care) for a cesarean birth mother may need to be modified according to her physiologic limitations as a surgical patient.

Daily care includes perineal care, breast care, and routine hygienic care, including showering after the dressing has been removed (if showering is acceptable according to the woman’s cultural beliefs and practices). The nurse assesses the woman’s vital signs, incision, fundus, and lochia according to hospital policies, procedures, or protocols. Breath sounds, bowel sounds, circulatory status of lower extremities, and urinary and bowel elimination also are assessed. It is important to note maternal emotional status.

During the postpartum period, the nurse also can provide care that meets the psychologic and teaching needs of mothers who have had cesarean births. The nurse can explain postpartum procedures to help the woman participate in her recovery from surgery. The nurse can help the woman plan care and visits from family and friends that will allow adequate rest periods. Information on and assistance with infant care can facilitate adjustment to her role as a mother. The woman is supported as she breastfeeds her baby by receiving individualized assistance to comfortably hold and position the baby at her breast. The side-lying position and the use of pillows to support the newborn can enhance comfort and facilitate successful breastfeeding. The partner can be included in infant teaching sessions, and in explanations about the woman’s recovery. The couple also should be encouraged to express their feelings about the birth experience. Some parents are angry, frustrated, or disappointed that a vaginal birth was not possible. Some women express feelings of low self-esteem or a negative self-image. Others express relief and gratitude that the baby is healthy and safely born. It may be helpful for them to have the nurse who was present during the birth visit and help fill in “gaps” about the experience. Other psychologic and lifestyle concerns that have been reported include depression, feeling limited in activities, and changes in family interactions (Gamble & Creedy, 2004).

Discharge after cesarean birth is usually by the third postoperative day. The time is often determined by criteria established by the woman’s insurance carrier or the federal government (e.g., diagnosis-related groups).

The Newborn’s and Mother’s Health Protection Act of 1996 provides for a length of stay of up to 96 hours for cesarean births. These criteria may not coincide with the woman’s physical or psychosocial readiness for discharge. Some states have added home care provisions for mothers who meet appropriate criteria for discharge and choose to leave sooner than the allowed length of stay. This policy recognizes that home care is less costly than hospital care and in most cases is more beneficial for recovery.

The nurse provides discharge teaching to prepare women for self-care and newborn care in a limited time, while trying to ensure that the woman is comfortable and able to rest. Discharge teaching and planning should include information about nutrition; measures to relieve pain and discomfort; exercise and specific activity restrictions; time management that includes periods of uninterrupted rest and sleep; hygiene, breast, and incision care; timing for resumption of
## Cesarean Birth without Complications: Expected Length of Stay—48 to 72 Hours

<table>
<thead>
<tr>
<th>ASSESSMENTS</th>
<th>IMMEDIATE POSTOP CESAREAN</th>
<th>BY FOURTH HOUR AFTER ADMISSION TO PP UNIT</th>
<th>5 TO 24 HOURS</th>
<th>25 TO 48 HOURS</th>
<th>BY DISCHARGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vital Signs</td>
<td>Recovery room or PACU admission assessment complete</td>
<td>PP admission assessment and care plan completed</td>
<td>q4-8h, WNL</td>
<td>q8h, WNL</td>
<td>q8h, WNL</td>
</tr>
<tr>
<td>Postpartum Assessment</td>
<td>q15min x 1 hr; q30min x 4 hr; WNL</td>
<td>q4-8h, WNL</td>
<td>q8h, WNL</td>
<td>q8h, WNL</td>
<td></td>
</tr>
<tr>
<td>Abdominal Incision</td>
<td>Dressing dry and intact</td>
<td>Dressing dry and intact</td>
<td>Dressing dry and intact</td>
<td>Incision intact; staples may be removed and Steri-Strips in place, incision WNL</td>
<td></td>
</tr>
<tr>
<td>Genitourinary</td>
<td>Retention catheter output &gt; 30 ml/hr</td>
<td>Retention catheter output &gt; 30 ml/hr</td>
<td>Catheter discontinued, output &gt; 100 ml/void or 240 ml/h</td>
<td>Urine output &gt; 240 ml/8 hr</td>
<td></td>
</tr>
<tr>
<td>Gastro-intestinal</td>
<td>Absent or hypoactive BS</td>
<td>Hypoactive to active BS</td>
<td>Active BS + flatus</td>
<td>Active BS + flatus; may or may not have BM</td>
<td></td>
</tr>
<tr>
<td>Musculoskeletal</td>
<td>Alert or easily aroused, can move legs</td>
<td>Alert and oriented, moving all extremities</td>
<td>Ambulating with help</td>
<td>Ambulating unassisted</td>
<td>Ambulating ad lib</td>
</tr>
<tr>
<td>Bonding</td>
<td>Evidence of parent-infant bonding; first breastfeeding if desired</td>
<td>Parent-infant bonding continues</td>
<td>Parent-infant bonding progressing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laboratory Tests</td>
<td>Intrapartal CBC results on chart or computer; determine Rh status and need for anti-Rh globulin; check for rubella immunity</td>
<td>PP HCT/WNL, give anti-Rh globulin if indicated</td>
<td>Give rubella vaccine if indicated</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

BS, bowel sounds; BM, bowel movement; CBC, complete blood count; HCT, hematocrit; PACU, postanesthesia care unit; Postop, postoperative; PP, postpartum; WNL, within normal limits

Continued
sexual activity and contraception; signs of complications (see Teaching Guidelines: Patient Instructions for Self-Care: on p. 808) and infant care. The nurse assesses the woman’s need for continued support or counseling to facilitate her emotional recovery from the birth. The woman’s family and friends should be educated regarding her needs during the recovery process, and their assistance should be coordinated before discharge. Referral to support groups or to community agencies may be indicated to promote the recovery process further. A postdischarge program of telephone follow-up and home visits can facilitate the woman’s full recovery after cesarean birth.

Vaginal birth after cesarean

Indications for primary cesarean birth, such as dystocia, breech presentation, or fetal distress, often are nonrecurring. Therefore a woman who has had a cesarean birth may subsequently become pregnant and not have any contraindications to labor and vaginal birth in that pregnancy and may attempt a vaginal birth after cesarean (VBAC).

ACOG (2004a) encourages a TOL and VBAC attempt in women who have had one previous cesarean birth by low transverse incision. Vaginal birth is relatively safe, but there is risk for uterine rupture through a lower uterine segment scar. Increased reports of uterine rupture in the United States

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### CARE PATH

<table>
<thead>
<tr>
<th>INTERVENTIONS</th>
<th>IMMEDIATE POSTOP CESAREAN</th>
<th>BY FOURTH HOUR AFTER ADMISSION TO PP UNIT</th>
<th>S 5 TO 24 HOURS</th>
<th>25 TO 48 HOURS</th>
<th>BY DISCHARGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV</td>
<td>IV continues</td>
<td>IV continues</td>
<td>IV continues</td>
<td>IV may be discontinued</td>
<td></td>
</tr>
<tr>
<td>Diet</td>
<td>NPO</td>
<td>Ice chips, sips of clear liquids</td>
<td>Clear liquids</td>
<td>Regular diet or as tolerated</td>
<td>Regular diet</td>
</tr>
<tr>
<td>Perineal</td>
<td>Pericare by nurse</td>
<td>Pericare with help</td>
<td>Self-pericare</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activity</td>
<td>Bed rest</td>
<td>Bed rest</td>
<td>OOB = 3 with help, ADLs assisted, assisted to comfortable position to hold and feed baby</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulmonary Care</td>
<td>Patent airway; O₂ discontinued</td>
<td>TCDB q2h with splinting, incentive spirometry q1h if ordered, lungs clear</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Medications | Oxytocin added to IV
Pain control: analgesics, IV, or epidural narcotic as ordered |
| *Adapted from the Society of Obstetricians and Gynecologists of Canada* (2005) and American College of Obstetricians and Gynecologists (2004a) guidelines.*

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**ADLs**, activities of daily living; IM, intramuscularly; IV, intravenously; NPO, nothing by mouth; NSAIDs, nonsteroidal antiinflammatory drugs; OOB, out of bed; PCA, patient-controlled analgesia; PNV, prenatal vitamins; PO, nothing by mouth; Rx, prescription; TCDB, turn, cough, deep breathe.
and Canada in the 1990s have raised concerns about the safety of VBAC. Labor and vaginal birth are not recommended if there are contraindications, such as a previous fundal classic cesarean scar, a scar from uterine surgery, or evidence of CPD. Women are strongly advised against attempting VBACs in birth centers because the health risks are too great (Bowes & Thorp, 2004; Lieberman, Ernst, Rooks, Stapleton, & Flamm, 2004).

Women are most often the primary decision makers with regard to choice of birth method. During the antepartal period, the woman should be given information about VBAC and encouraged to choose it as an alternative to repeat cesarean birth, as long as no contraindications exist (Ridley, Davis, Bright, & Sinclair, 2002). VBAC support groups and prenatal classes can help prepare the woman psychologically for labor and vaginal birth.

This labor should occur in a hospital facility that has the equipment and personnel available to begin the surgery within 30 minutes from the time a decision is made to perform cesarean birth (ACOG, 2004a). Ideally the woman is admitted to the labor and birth unit at the onset of spontaneous labor. In the latent phase of labor, the nurse encourages her to engage in normal activities such as ambulation. In the active phase of labor, FHR and pattern and uterine activity usually are monitored electronically, and intravenous access such as a saline lock may be established. The
physician or nurse-midwife should be immediately available during active labor.

There is no evidence that administering oxytocin to induce or augment labor or the use of epidural anesthesia is contraindicated, although caution and close monitoring of the laboring woman are urged if these are used (Bowers & Thorp, 2004). However, use of prostaglandins, especially misoprostol (prostaglandin E1), to ripen the cervix or induce labor is not recommended because they have been associated with an increased risk for uterine rupture (ACOG, 2000; Gilbert & Harmon, 2003). Although the exact cause of postterm pregnancy is still unknown, a possible cause may be deficiency of placental estrogen and continued secretion of progesterone. Low levels of estrogen may result in a decrease in prostaglandin precursors and reduced formation of oxytocin receptors in the myometrium (Gilbert & Harmon, 2003). A woman who experiences one postterm pregnancy is more likely to experience it again in subsequent pregnancies (Divon, 2002).

Clinical manifestations of postterm pregnancy include maternal weight loss (more than 1.4 kg/wk) and decreased uterine size (related to decreased amniotic fluid), meconium in the amniotic fluid, and advanced bone maturation of the fetal skeleton with an exceptionally hard fetal skull (Gilbert & Harmon, 2003).

Maternal and Fetal Risks

Maternal risks are often related to the birth of an excessively large infant. The woman is at increased risk for dysfunctional labor; birth canal trauma, including perineal lacerations and extension of episiotomy during vaginal birth; postpartum hemorrhage; and infection. Interventions such as induction of labor with prostaglandins or oxytocin, forceps- or vacuum-assisted birth, and cesarean birth are more likely to be necessary. The woman also may experience fatigue and psychological reactions such as depression, frustration, and feelings of inadequacy as she passes her estimated date of birth (ACOG, 2000; Gilbert & Harmon, 2003).

Fetal risks appear to be twofold. The first is the possibility of prolonged labor, shoulder dystocia, birth trauma, and asphyxia from macrosomia. Macrosomia occurs when the fetus continues to provide adequate nutrients to support fetal growth after 40 weeks of gestation. It is estimated to occur in approximately 25% of prolonged pregnancies (Divon, 2002). The second risk is the compromising effects on the
Postterm Pregnancy

Shelly is 36 years old, G2, P1001, at 41 weeks of gestation. She was sent to the perinatal unit at the antepartum clinic for a biophysical profile. She asks why she just can’t be admitted to the Labor and Birth Unit and have a cesarean birth. How will you respond to her question?

1. Is there sufficient evidence to draw conclusions about the benefits of cesarean birth for postterm pregnancy?
2. What assumptions can be made about the following issues?
   a. Elective cesarean for postterm pregnancy
   b. Timing of induction of labor for postterm pregnancy
   c. Antepartal testing for postterm pregnancy
   d. What implications and priorities for nursing care can be drawn at this time?
3. Does the evidence objectively support your conclusion?
4. Are there alternative perspectives to your conclusion?

Critical Thinking Exercise

Postterm Pregnancy

A decreased AFV (i.e., oligohydramnios) has been associated with fetal stress. The woman and her family should be fully informed regarding the tests, including why they are performed and the meaning of the results obtained in terms of the health of the mother and fetus.

Cervical checks usually are performed weekly after 40 weeks of gestation to determine whether the condition of the cervix is favorable for induction (5 or greater on the Bishop score for multiparas and 9 or more for nulliparas) (see Table 24-3). Vaginal secretions may be assessed for the amount of fetal fibronectin; a low concentration may predict increased risk for prolonged pregnancy, but results of studies have thus far been inconclusive (Divon, 2002; Gilbert & Harmon, 2003).

During the postterm period, the woman is encouraged to assess fetal activity daily, assess for signs of labor, and keep appointments with her primary health care provider (Patient Instructions for Self-Care). The woman and her family should be encouraged to express their feelings (e.g., frustration, anger, impatience, fear) about the prolonged pregnancy and should be helped to realize that these feelings are normal. At times the emotional and physical strain of a postterm pregnancy may seem insurmountable. Referral to a support group or another supportive resource may be needed.

If the woman’s cervix is favorable, labor is usually induced with oxytocin. If not, continued fetal surveillance or a cervical ripening agent (e.g., prostaglandin insert or gel) may be administered, followed by oxytocin induction (ACOG, 2004b; Gilbert & Harmon, 2003; Resnik & Resnik, 2004).

The fetus of a woman with a postterm pregnancy should be monitored electronically for a more accurate assessment of the FHR and pattern. Fetal scalp pH sampling or fetal oxygen saturation monitoring may be done to determine whether acidosis is occurring. Inadequate fluid volume leads to compression of the cord, which results in fetal hypoxia that is reflected in variable or prolonged deceleration patterns and passage of meconium. If oligohydramnios is present, an amnioinfusion may be performed to restore amniotic fluid volume to maintain a cushioning of the cord. The use of amnioinfusion to treat fetal distress associated with oligohydramnios in labor is a form of care likely to be beneficial (Einkin et al., 2000).

Collaborative Care

The management of postterm pregnancy is still controversial. The induction of labor at 41 to 42 weeks is suggested by some authorities as a means of reducing the rate of cesarean birth and stillbirth or neonatal death (ACOG, 2004b; Resnik & Resnik, 2004). Others follow a more individualized approach, allowing the pregnancy to proceed to 43 weeks of gestation as long as assessment of fetal well-being with a combination of tests is performed and the results of the tests are normal. Tests are usually performed on a weekly or twice-weekly basis (ACOG, 2004b; Divon, 2002; Myers et al., 2002).

Antepartum assessments for postterm pregnancy may include daily fetal movement counts, NSTs, AFV assessments, contraction stress tests (CSTs), BPPs, and Doppler flow measurements. The BPP may be the best way of gauging fetal well-being because it combines nonstress testing with real-time ultrasound scanning to assess fetal movements, fetal breathing movements, and the AFV. Determining the AFV is critical in women with postterm pregnancies because

Collaborative Care

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Emotional support is essential for the woman with a post-term pregnancy and her family. A vaginal birth is anticipated, but the couple should be prepared for a forceps-assisted, vacuum-assisted, or cesarean birth if complications arise.

Expected outcomes of care include that the woman and her family use appropriate coping mechanisms to deal with the emotional aspects of her postterm pregnancy and that the woman and her newborn experience no injury during the birth.

**Shoulder Dystocia**

Shoulder dystocia is an uncommon obstetric emergency that increases the risk for fetal and maternal morbidity and mortality during the attempt to deliver the fetus vaginally. It is a condition in which the head is born, but the anterior shoulder cannot pass under the pubic arch. FPD related to excessive fetal size (greater than 4000 g) or maternal pelvic abnormalities may be a cause of shoulder dystocia, although shoulder dystocia can occur in the absence of any known risk factors. The nurse should be observant for signs that could indicate the presence of shoulder dystocia, including slowing of the progress of labor and formation of a caput succedaneum that increases in size. When the head emerges, it retracts against the perineum (turtle sign), and external rotation does not occur (Bowes & Thorp, 2004).

The fetus is more likely to experience birth injuries related to asphyxia, brachial plexus damage, and fracture, especially of the humerus or clavicle. The mother’s primary risk stems from excessive blood loss as a result of uterine atony or rupture, lacerations, extension of the episiotomy, or endometritis. It is estimated that 0.24% to 2% of all vaginal births are complicated by shoulder dystocia (Bowes & Thorp, 2004).

**Collaborative care**

Many maneuvers such as suprapubic pressure and maternal position changes have been suggested and tried to free the anterior shoulder, although no one particular maneuver has been found to be most effective (Bowes & Thorp, 2004). Suprapubic pressure can be applied to the anterior shoulder by using the Mazzanti or Rubin technique (Fig. 24-13) in an attempt to push the shoulder under the symphysis pubis (Baskett, 2002).

In the McRoberts maneuver (Fig. 24-14), the woman’s legs are flexed apart, with her knees on her abdomen (Baskett, 2002; Baxley & Gobbo, 2004). This maneuver causes the sacrum to straighten, and the symphysis pubis rotates toward the mother’s head; the angle of pelvic inclination is decreased, freeing the shoulder. Suprapubic pressure can be applied at this time. The McRoberts maneuver is the preferred method when a woman is receiving epidural anesthesia.

Having the woman move to the hands-and-knees position (the Gaskin maneuver), squatting position, or lateral recumbent position also has been used to resolve cases of shoulder dystocia (Baskett, 2002; Bowes & Thorp, 2004). Fundal pressure is usually not advised as a method of relieving shoulder dystocia (Nocon, 2000; Simpson & Knox, 2001).

When shoulder dystocia is diagnosed, the nurse helps the woman to assume the position(s) that may facilitate birth of the shoulders, assists the primary health care provider with these maneuvers and techniques during birth, and documents the maneuvers. The nurse also provides encouragement and support to reduce anxiety and fear.

Newborn assessment should include examination for fracture of the clavicle or humerus as well as brachial plexus injuries and asphyxia (Bowes & Thorp, 2004). Maternal assessment should focus on early detection of hemorrhage and trauma to the soft tissue of the birth canal.
Prolapsed Umbilical Cord

Prolapse of the umbilical cord occurs when the cord lies below the presenting part of the fetus. Umbilical cord prolapse may be occult (hidden, not visible) at any time during labor whether or not the membranes are ruptured (Fig. 24-15, A and B). It is most common to see frank (visible) prolapse directly after rupture of membranes, when gravity washes the cord in front of the presenting part (Fig. 24-15, C and D). Contributing factors include a long cord (longer than 100 cm), malpresentation (breech), transverse lie, or unengaged presenting part.

If the presenting part does not fit snugly into the lower uterine segment (e.g., as in hydramnios), when the membranes rupture, a sudden gush of amniotic fluid may cause the cord to be displaced downward. Similarly the cord may prolapse during amniotomy if the presenting part is high. A small fetus may not fit snugly into the lower uterine segment; as a result, cord prolapse is more likely to occur.

Collaborative care

Prompt recognition of a prolapsed umbilical cord is important because fetal hypoxia resulting from prolonged cord compression (i.e., occlusion of blood flow to and from the fetus for more than 5 minutes) usually results in central nervous system damage or death of the fetus. Pressure on the cord may be relieved by the examiner putting a sterile gloved hand into the vagina and holding the presenting part off of the umbilical cord (Fig. 24-16, A and B). The woman is assisted into a position such as a modified Sims (Fig. 24-16, C), Trendelenburg, or knee-chest (Fig. 24-16, D) position, in which gravity keeps the pressure of the presenting part off the cord. If the cervix is fully dilated, a forceps- or vacuum-assisted birth can be performed for the fetus in a cephalic presentation; otherwise, a cesarean birth is likely to be performed. Nonreassuring FHR patterns, inadequate uterine relaxation, and bleeding also can occur as a result of a prolapsed umbilical cord. Indications for immediate interventions are presented in the Emergency box on p. 813. Ongoing assessment of the woman and her fetus is critical to determine the effectiveness of each action taken. The woman and her family are often aware of the seriousness of the situation; therefore the nurse must provide support by giving explanations for the interventions being implemented and their effect on the status of the fetus.

Rupture of the Uterus

Rupture of the uterus is a rare but very serious obstetric injury that occurs in 1 in 1500 to 2000 births. The most
frequent causes of uterine rupture during pregnancy are separation of the scar of a previous classic cesarean birth, uterine trauma (e.g., accidents, surgery), and a congenital uterine anomaly. During labor and birth, uterine rupture may be caused by intense spontaneous uterine contractions, labor stimulation (e.g., oxytocin, prostaglandin), an overdistended uterus (e.g., multifetal gestation), malpresentation, external or internal version, or a difficult forceps-assisted birth. It occurs more commonly in multigravidas than in primigravidas.

A uterine rupture is classified as either complete or incomplete. A complete rupture extends through the entire uterine wall into the peritoneal cavity or broad ligament. An incomplete rupture extends into the peritoneum but not into the peritoneal cavity or broad ligament. Bleeding is usually internal. An incomplete rupture may be a partial separation at an old cesarean scar and may go unnoticed unless the woman undergoes a subsequent cesarean birth or other uterine surgery.

Signs and symptoms vary with the extent of the rupture and may be silent or dramatic. In an incomplete rupture, pain may not be present. The fetus may or may not have late decelerations, decreased variability, an increased or decreased heart rate, or other nonreassuring signs. The woman may experience vomiting, faintness, increased abdominal tenderness, hypotonic uterine contractions, and lack of progress. Eventually, bleeding and the effects of blood loss will be noted. Fetal heart tones may be lost. In a complete rupture, the woman may complain of sudden, sharp shooting abdominal pain and may state that “something gave way.” If she is in labor, her contractions will cease, and pain is relieved. She may exhibit signs of hypovolemic shock caused by hemorrhage (i.e., hypotension, tachypnea, pallor, and cool, clammy skin). If the placenta separates, the FHR will be absent. Fetal parts may be palpable through the abdomen.

The nurse should suspect pulmonary embolism if the woman complains of chest pain.
Support of the woman’s partner and family is needed; information about spiritual support services or suggesting that the family contact their own support system may be warranted.

Amniotic Fluid Embolism

Amniotic fluid embolism (AFE) occurs when amniotic fluid containing particles of debris (e.g., vernix, hair, skin cells, or meconium) enters the maternal circulation and obstructs pulmonary vessels, causing respiratory distress and circulatory collapse. This can occur because fluid can enter the maternal circulation any time there is an opening in the amniotic sac or maternal uterine veins. Although rare, this complication is estimated to be the cause of 10% of maternal deaths in the United States. The fetal mortality rate is estimated to be as high as 30%, and 50% of the surviving infants will have neurologic damage (Cunningham et al., 2005).

Amniotic fluid is more damaging if it contains meconium and other particulate matter such as mucus, fat globules, lanugo, bacterial products, or debris from a dead fetus because emboli can then form more readily. Maternal death occurs most often when thick meconium is present in the amniotic fluid, because this clogs the pulmonary veins more completely than other debris. Even if death does not occur immediately, serious coagulation problems such as disseminated intravascular coagulopathy (see Chapter 26) usually occur (Cunningham et al., 2005).

Collaborative care

The immediate interventions for AFE are summarized in the Emergency box on p. 814. Such medical management must be instituted immediately. Cardiopulmonary resuscitation is often necessary. The woman is usually placed on mechanical ventilation, and blood replacement is initiated; coagulation defects are treated. Although the incidence of possible complications is small, their immediate recognition and prompt initiation of treatment are important.

NURSE ALERT

Automatic blood pressure devices, FHR monitors, and pulse oximeters may be inadequate and inaccurate during extreme clinical conditions. Assessment by a competent nurse is often more accurate than that provided by any one piece of equipment (Curran, 2003).

The nurse’s immediate responsibility is to assist with the resuscitation efforts. If the woman survives, she is usually moved to a critical care unit, where hemodynamic monitoring, blood replacement, and coagulopathy treatment are implemented. If cardiopulmonary arrest occurs, for optimal fetal survival, a perimortem cesarean birth should occur within 5 minutes (Curran, 2003).

Support of the woman’s partner and family is needed; they will be anxious and distressed. Brief explanations of

Collaborative care

Prevention is the best treatment. Women who have had a previous classic cesarean birth are advised not to attempt vaginal birth in subsequent pregnancies. Women at risk for uterine rupture are assessed closely during labor. Women whose labor is induced with oxytocin or prostaglandin (especially if their previous birth was cesarean) are monitored for signs of uterine hyperstimulation, because this can precipitate uterine rupture. If hyperstimulation occurs, the oxytocin infusion is discontinued or decreased, and a tocolytic medication may be given to decrease the intensity of the uterine contractions. After giving birth, women are assessed for excessive bleeding, especially if the fundus is firm and signs of hemorrhagic shock are present.

If rupture occurs, the type of medical management depends on the severity. A small rupture may be managed with a laparotomy and birth of the infant, repair of the laceration, and blood transfusions, if needed. For a complete rupture, hysterectomy and blood replacement is the usual treatment.

The nurse’s role may include starting intravenous fluids, transfusing blood products, administering oxygen, and assisting with the preparation for immediate surgery. Supporting the woman’s family and providing information about the treatment is important during this emergency. The associated fetal mortality rate is high (50% to 75%), and the maternal mortality rate may be high if the woman is not treated immediately (Cunningham et al., 2005). Providing information about spiritual support services or suggesting that the family contact their own support system may be warranted.

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Support of the woman’s partner and family is needed; they will be anxious and distressed. Brief explanations of
what is happening are important during the emergency and can be reinforced after the immediate crisis is over. If the woman dies, emotional support and involvement of the perinatal loss support team or other resource for grief counsel-

**Amniotic Fluid Embolism**

**Signs**
- Respiratory Distress
  - Restlessness
  - Dyspnea
  - Cyanosis
  - Pulmonary edema
  - Respiratory arrest
- Circulatory Collapse
  - Hypotension
  - Tachycardia
  - Shock
  - Cardiac arrest
- Hemorrhage
  - Coagulation failure: bleeding from incisions, venipunc-
  ture sites, trauma (lacerations); petechiae, ecchymoses,
  purpura
  - Uterine atony

**Interventions**
- Oxygenate
  - Administer oxygen by face mask (8 to 10 L/min) or re-
  suscitation bag delivering 100% oxygen.
  - Prepare for intubation and mechanical ventilation.
  - Initiate or assist with cardiopulmonary resuscitation; tilt
  pregnant woman 30 degrees to side to displace uterus.
- Maintain cardiac output and replace fluid losses
  - Position woman on her side.
  - Administer intravenous fluids.
  - Administer blood: packed cells, fresh frozen plasma.
  - Insert indwelling catheter, and measure hourly urine
  output.
- Correct coagulation failure
  - Monitor fetal and maternal status
  - Provide emotional support to woman, her
  partner, and family

**Preterm Labor**

- Preterm labor is cervical change and uterine con-
  tractions occurring between 20 weeks and 37
  weeks of pregnancy; preterm birth is any birth that
  occurs before the completion of 37 weeks of preg-
  nancy.
- The cause of preterm labor is unknown and is as-
  sumed to be multifactorial; therefore it is not poss-
  sible to predict with certainty which women will
  experience preterm labor and birth.
- Because the onset of preterm labor is often in-
  sidious and can be mistaken for normal discom-
  forts of pregnancy, nurses should teach all preg-
  nant women how to detect the early symptoms of
  preterm labor and to call their primary health care
  provider when symptoms occur.
- Bed rest, a commonly prescribed intervention for
  preterm labor, has many deleterious side effects
  and has never been shown to decrease preterm
  birth rates.
- Research has demonstrated that a gain of 48 hours
to several days is the best outcome that can be ex-
  pected with the use of tocolytics. The best reason
  to use tocolytic therapy is to achieve sufficient
time to administer glucocorticoids in an effort to
  accelerate fetal lung maturity and reduce the sever-
  ity of respiratory complications in infants born
  preterm.
- Vigilance for signs of infection is a major part of
  the care for women with PPROM.
The priority for nursing care is to work with Yolanda to prevent preterm birth. Assisting Yolanda to maintain bed rest as ordered, providing diversions, reducing anxiety, and coaching her in exercises she can perform in bed to maintain muscle tone and prevent bone loss are actions to take. Providing explanations and keeping the family informed are essential. The nurse and uterine contractions are monitored as required by protocol or the mother's pelvis are altered by maternal positioning. Uterine contractility is increased by the effects of oxytocin and prostaglandin and is decreased by tocolytic agents. Cervical ripening using chemical or mechanical measures can increase the success of labor induction. Expectant parents benefit from learning about operative obstetrics (e.g., forceps-assisted, vacuum-assisted, or cesarean birth) during the prenatal period.

The basic purpose of cesarean birth is to preserve the life or health of the mother and her fetus. Unless contraindicated, vaginal birth is possible after a previous cesarean birth. Labor management that emphasizes one-to-one support of the laboring woman by another woman (e.g., doula, nurse, nurse-midwife) can reduce the rate of cesarean birth and increase the rate of VBACs. A postpartum pregnancy poses a risk to both the mother and the fetus. Obstetric emergencies (e.g., shoulder dystocia, prolapsed cord, rupture of the uterus, and amniotic fluid embolism) occur rarely but require immediate intervention to preserve the health or life of the mother and fetus.

### Key Points—cont’d
- Dystocia results from differences in the normal relations among any of the five factors affecting labor and is characterized by differences in the pattern of progress in labor.
- Dysfunctional labor occurs as a result of hypertonic uterine dysfunction, hypertonic uterine dysfunction, or inadequate voluntary expulsive forces.
- The functional relations among the uterine contractions, the fetus, and the mother’s pelvis are altered by maternal positioning.
- Uterine contractility is increased by the effects of oxytocin and prostaglandin and is decreased by tocolytic agents.
- Cervical ripening using chemical or mechanical measures can increase the success of labor induction.
- Expectant parents benefit from learning about operative obstetrics (e.g., forceps-assisted, vacuum-assisted, or cesarean birth) during the prenatal period.
- The basic purpose of cesarean birth is to preserve the life or health of the mother and her fetus.
- Unless contraindicated, vaginal birth is possible after a previous cesarean birth.
- Labor management that emphasizes one-to-one support of the laboring woman by another woman (e.g., doula, nurse, nurse-midwife) can reduce the rate of cesarean birth and increase the rate of VBACs.
- A postpartum pregnancy poses a risk to both the mother and the fetus.
- Obstetric emergencies (e.g., shoulder dystocia, prolapsed cord, rupture of the uterus, and amniotic fluid embolism) occur rarely but require immediate intervention to preserve the health or life of the mother and fetus.

### Answer Guidelines to Critical Thinking Exercises

#### Preterm Labor
1. There is no evidence in the literature to support the efficacy of bed rest in reducing preterm birth rates; it is a form of care with unknown effectiveness (Eakin et al., 2000; Maloni, 1998). Deteriorous effects of bed rest on women include decreased muscle tone, weight loss, calcium loss, and glucose intolerance. Weeks of bed rest lead to bone demineralization, constipation, fatigue, isolation, anxiety, and depression.

2. a. Because this is Yolanda’s third hospitalization for preterm labor, her risks of giving birth prematurely are increased. Her primary health care provider could choose to have her remain hospitalized until birth to increase the chances of a good outcome for the baby.

   b. Bed rest is often ordered as an intervention to prevent preterm birth even though it is of unknown effectiveness. Hospitalization at a facility that can handle high risk or preterm infants increases the chances of a good outcome. Although the home is an ideal location for a pregnant woman, the primary health care provider may have knowledge that Yolanda would be unlikely to remain on bed rest at home because of the need to care for her husband and child.

   c. The nurse can coach Yolanda and her family in ways to reduce the frustration and boredom that accompany restriction to bed rest for several weeks. The environment can be modified for convenience, and essential items placed within reach (e.g., telephone, television, radio, tape or compact disc player, computer with Internet access, snacks, books, magazines, newspapers, and items for hobbies). Families, who are often anxious regarding the health status of the mother and baby, may need help in learning how to organize time and space or to restructure family routines so that the pregnant woman can remain a part of family activity while still maintaining bed rest.

   d. The nurse can explore resources available in the community to assist with care of Yolanda’s 2-year-old son. Referral to a social worker can be made. Family members can be asked to help, church and social groups can be helpful.

3. The priority for nursing care is to work with Yolanda to prevent preterm birth. Assisting Yolanda to maintain bed rest as ordered, providing diversions, reducing anxiety, and coaching her in exercises she can perform in bed to maintain muscle tone and prevent bone loss are actions to take. Providing explanations and keeping the family informed are essential. The nurse and uterine contractions are monitored as required by protocol or the mother’s pelvis are altered by maternal positioning. Uterine contractility is increased by the effects of oxytocin and prostaglandin and is decreased by tocolytic agents. Cervical ripening using chemical or mechanical measures can increase the success of labor induction.

#### Postterm Pregnancy
1. There is no evidence in the literature to support elective cesarean for prolonged pregnancy when there is no maternal or fetal compromise.

2. a. Elective cesarean for any pregnant woman, whether or not she is postterm, may carry iatrogenic risks, such as increased rates of infection, hemorrhage, or other complications.

   b. There is insufficient evidence to recommend one specific time for labor induction. The common practices are to induce labor at 41 or 42 weeks in the presence of a favorable (inducible) cervix. If the cervix is not favorable, management alternatives include use of cervical ripening agents followed by induction or expectant management with antenatal fetal monitoring twice a week.

   c. There is no direct, unbiased evidence that antepartal testing reduces perinatal morbidity and mortality in prolonged gestation. Although the risk of antepartal stillbirth increases with increasing gestational age, there is no evidence that allows determination of the optimal time to initiate antepartal testing. However, common practice is to initiate the BPP and some part of it such as the NST and AFV assessment to assess...
fetal condition and to identify oligohydramnios at 41 or 42 weeks of gestation. Testing is usually done twice weekly. Nursing priorities are to encourage the woman to express her feelings about having a prolonged pregnancy, to provide support, to teach her how to assess daily fetal movement (kick counts), and to recognize signs of labor. She should also be encouraged to keep all appointments for fetal assessment tests and cervical checks and to come to the labor and birth unit as soon as her membranes rupture or labor begins.

4. Yes, the evidence objectively supports these conclusions, as there is no one way to manage postterm pregnancy.
5. Yes. Alternative ways to stimulate labor have been studied (e.g., castor oil, stripping membranes, nipple stimulation, sexual intercourse). In general, there is a tradeoff between the effectiveness of induction agents in terms of achieving the labor and risks of uterine tachysystole, hyperstimulation, and potential fetal compromise.

References: ACOG, 2004b; Bowes & Thorp, 2004; Gilbert & Harmon, 2003; Myers et al., 2002; Resnik & Resnik, 2004; Simpson, 2002.


