or most people, rearing a child is the single most important, time-consuming, and demanding activity they will ever engage in. It may then come as a surprise that all too often people do not plan to become parents. The evidence indicates that almost half of all pregnancies are unintended (Dietz et al., 1999; Ispa, Sable, Porter, & Csizmadia, 2007). About half (53%) of those unintended pregnancies
are due to contraception failure (Trussell, Vaughan, & Stanford, 1999). Forty-two percent of unintended pregnancies are ended by elective abortion (Finer & Henshaw, 2006). Some of the children born from the remaining pregnancies are unwanted by one or both parents. Not surprisingly, unwanted children are at risk for a range of problems, as will be discussed later in this chapter.

Bringing a child into the world is a peak experience that brings joy into parents’ lives. But it also produces fundamental life changes. As parenting expert Marc Bornstein observed, “By their very coming into existence, infants forever alter the sleeping, eating, and working habits of their parents; they change who parents are and how parents define themselves” (2002a, p. 3).

The arrival of the baby signifies the onset of a major new responsibility, often results in role changes, and may dredge up old psychological issues from the new parent’s own childhood. Due to these and other changes, early researchers studying the transition to parenthood dubbed it a time of “crisis.”

Although subsequent researchers have toned down the alarming language, there is no question that the arrival of an infant represents many fundamental changes for parents. One adjustment is financial; raising a child is expensive. The cost of having and rearing a child through the age of 18 years is estimated by the government to be, on average, about $191,000 (Lino, 2008). The USDA (U.S. Department of Agriculture) shows that families with low incomes spend about $143,790; wealthier families spend about $289,380 (more than double the amount of a low-income family). To see for yourself the different expenses associated with rearing children and how the costs change based on family structure, region of the country, and family income, go to www.cnpp.usda.gov/calculator.htm. These figures do not include the costs of a college education, which continue to rise. One year of college at a private university can easily cost more than $45,000 a year. Factor in the lost wages of the “full-time” or stay-at-home mom, and the average figure tops $1.6 million.

Illustration 6.1  A 2-month-old boy.
Source: Photograph by J. P. Bell.
Why does it cost so much to rear a child? Consider some of the expenses for an infant’s first year of life. Two-parent families making between $46,000 and $77,000 per year spend, on average, about $410 on clothing, $780 for health care, and $2,000 for infant care (Lino, 2008). A high-end stroller can cost $900! The family will also need a crib, car seat, toys, and other necessities like diapers. Then there are costs for food, housing, and transportation. Costs vary, of course, depending on multiple factors, however, the USDA estimates that the first two years of a child’s life will cost parents somewhere between $15,700 and $32,600 (Lino, 2008). Some specific costs of childbirth, diapers, feeding, and day care can be found in Illustration 6.2.

Illustration 6.2  Some First-Year Expenses Associated With Having a Newborn

Notes:
2. Estimates based on 6 to 8 ounces every 4 to 6 hours at 13.5¢ per ounce.
3. Estimates based on 40 weeks at $170 per week.

Deciding to Have a Child

Not all couples decide to have children. In the past, voluntarily childless couples were often viewed with pity or criticism as selfish, immature, abnormal, or simply unhappy (DeOllos & Kapinus, 2002). Today, however, the choice is more accepted. And whereas many couples struggling with infertility consider themselves “childless,” an increasing number of couples are choosing this state and prefer the term “childfree.” In Germany, about 25% of married couples are, by choice, childfree. In the United States, the number is closer to 7%. Many motivations can lead couples to this decision. They may consider themselves too old, dislike children, seek a different lifestyle, have financial or career
concerns, or view the world as too hostile a place to introduce children (Weston & Qu, 2001). One environmental group, the Voluntary Human Extinction Movement, even promotes going childless because humans have polluted the earth (Weisman, 2007). They distribute bumper stickers that read, “Thank You for Not Breeding,” and encourage adoption instead for those who wish to fulfill their parenting drive.

Many couples, however, do decide to have children—either through birth or adoption. In a study of 600 couples in their first 6 years of marriage, researchers investigated common reasons for wanting a child (Neal, Groat, & Wicks, 1989). Table 6.1 lists some of the most frequently mentioned benefits and problems associated with being a parent, according to those couples.

Based on the pattern of advantages and disadvantages identified by the couples studied, four types of parents were identified. Surprisingly, only 30% of the couples were classified as “pro-children” (they identified many pros and few cons to becoming parents). An equal percentage of couples were labeled “anti-children” (they saw few benefits but many problems). Twenty percent of the couples identified both pros and cons to the idea and were classified “ambivalent.” The remaining 20% of couples apparently had not thought much about having children, because they mentioned few advantages or disadvantages. They were labeled “indifferent.” Neal and his colleagues (1989) concluded that, although some couples make a careful, deliberate decision to have a child, other couples “simply experience their pregnancies as happenings, unplanned events, occurrences, or the will of God” (p. 325).

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allows for a full family life</td>
<td>Results in a drastic change in lifestyle</td>
</tr>
<tr>
<td>Offers a sense of personal accomplishment</td>
<td>Creates many time-consuming responsibilities</td>
</tr>
<tr>
<td>Adds excitement to life</td>
<td>Increases expenses</td>
</tr>
<tr>
<td>Provides a source of love and affection</td>
<td>Introduces difficulties regarding mothers’ employment</td>
</tr>
<tr>
<td>Promotes a sense of immortality</td>
<td>Other: Contributes to overpopulation, creates worry and tension, makes for too much disorder, and introduces negative effects on one’s health and stamina</td>
</tr>
<tr>
<td>Other: Gives spiritual fulfillment, establishes oneself as a mature person, and fulfills sexual love</td>
<td></td>
</tr>
</tbody>
</table>

Source: Adapted from Neal et al., 1989.
In what is becoming an increasingly common trend in the United States, approximately 33% of births are to unmarried women. These women tend to be older, have other children, and (except for African Americans) may be living with a partner. Most (95%) of these women do not have a college education (Musick, 2002). A major, multisite study called “Fragile Families” is under way to better understand these families. Nearly 5,000 children, three quarters of whom are born to unmarried parents, are being studied. These families are considered fragile because the biological parents are at greater risk of breaking up and living in poverty than are parents in traditional, married families (McLanahan & Carlson, 2004).

Getting Pregnant, Staying Pregnant, and Encountering Problems

Whether or not a deliberate decision was made to have a child, once a woman’s egg is fertilized, she has been placed on a course of dramatic and rapid change in her body and in the developing embryo and fetus. On average, pregnancies last 40 weeks from the first day of the woman’s last menstrual period, though anywhere from 38 to 42 weeks is considered normal.

There are many advantages to planning a pregnancy. The greatest danger in an unplanned pregnancy is to the developing embryo. Before the woman is aware she is pregnant, she could be exposed to or ingest harmful substances. These substances, called teratogens, include drugs (including prescriptions, over-the-counter medication, alcohol, and nicotine), health factors (such as diabetes), infections (especially sexually transmitted diseases), environmental chemicals (such as herbicides), and physical agents (especially X-rays). Teratogenic effects depend on such factors as the time since conception, the type and dose of the substance, and the length of time the embryo or fetus was exposed to the substance, as well as the developing child’s genetic susceptibility.

Alcohol is one of the most commonly used teratogens. The problem that can result from maternal drinking during pregnancy is called Fetal Alcohol Spectrum Disorder (FASD). This disorder is found in 0.2 to 1.5 per 1,000 babies (Centers for Disease Control, 2005b). It is labeled “spectrum” because there is a continuum of permanent birth defects. One of the most severe FASDs is Fetal Alcohol Syndrome (FAS). It is characterized by abnormal facial features, growth deficiencies, and problems with a child’s central nervous system. Areas commonly affected by FAS include learning, memory, attention span, communication, vision, and hearing.

How much alcohol does it take to cause a FASD? There is no simple answer. Many children (60 to 70%) born to alcoholics show no signs of FAS, but they are likely to have some indications of damage due to alcohol. Still, there is evidence that even a single alcohol binge can damage an embryo’s brain (Olney, 2000). In 2005, the then U.S. Surgeon General, Richard H. Carmona, urged pregnant women and even women who could become pregnant to avoid any alcohol consumption.

Smoking cigarettes is another easily avoidable teratogen. In the United States, about 18% of women smoke, and 10% of pregnant women smoke. Cigarette smoking
decreases the amount of oxygen that crosses the placenta and exposes the fetus to nicotine and carbon monoxide. This doubles the likelihood of having a low-birth-weight or preterm baby and increases the risk of pregnancy complications, including stillbirth (delivery of a dead baby) (March of Dimes, 2008).

Although not technically a teratogen, a mother’s negative emotions can be damaging too. There is some evidence that a woman’s feelings about her pregnancy can have important long-term implications for both the mother and child. Negative feelings are certainly understandable. Women’s bodies go through a number of dramatic changes in order to carry a fetus to term and prepare for childbirth and breastfeeding. Most obvious is the change in abdomen size and shape. A woman with a prepregnancy waist size of 28 inches may grow to 48 inches before delivery. If not for the pregnancy, this would be considered a bizarre and unhealthy body change. Although some women enjoy pregnancy and the changes that accompany it, other women react negatively. Weight gain is an inevitable consequence of pregnancy. Women of normal prepregnancy weight should gain 25 to 35 pounds (more for twins), but some women gain much more. One in five women gain more than 40 pounds, an amount considered excessive for most women (Martin et al., 2006). Then there are the hormonal changes, changes in breast size and tenderness, and sometimes dramatic emotional shifts. Women who accept their pregnancy and all the changes that it brings (whether the pregnancy was planned or not), tend to have lower levels of parenting stress later and are more likely to raise a securely attached child (Ispa et al., 2007).

Although many people aspire to become parents, the path to parenthood has several potential pitfalls. Some of these are infertility, genetic defects, miscarriages, and ectopic pregnancies.

**Infertility and Its Treatment**

About 20% of couples are involuntarily childless due to fertility problems. The human reproductive process is a complex system that can malfunction for many reasons—from either partner. Female fertility problems can be caused by a number of issues, including fallopian tube damage, endometriosis (when uterine tissue grows outside the uterus), ovulation disorders, hormonal problems, and early menopause. The most common causes of male infertility include problems in producing healthy sperm, low sperm concentrations, hormonal problems, genetic defects, impaired delivery of sperm, or overheating of the testicles (often from frequent use of hot tubs). For more information, visit the Mayo Clinic’s Web site (www.mayoclinic.com).

Though few women would choose infertility, many American families are inadvertently increasing their risk for infertility by delaying childbirth beyond their peak birthing years. The average maternal age in the United States for first birth is 25.2 (Martin et al., 2006). Twenty percent of mothers have their first child after the age of 35. This trend is also present in Ireland and other European countries; the average age of first-time mothers in Ireland is now 31. Some women delaying parenthood are pursuing an education or a career. Some are simply waiting for the right partner.
Delayed parenthood means increased likelihood of fertility problems. Older women ovulate less frequently, and a woman’s risk for some conditions—such as endometriosis, gestational diabetes, and placental defects—increases as she ages. Older fathers are more at risk for fertility problems as well.

Older parenthood also increases the risk of birth defects in children. A well-documented example is the positive association of maternal age and children born with Down syndrome (also called Trisomy 21). Although it is possible for a young mother to have a child with Down syndrome, the likelihood increases dramatically after about age 40. Fathers’ age also has been linked to increased likelihood of Down syndrome births—when their wives are over 35 years of age (Fisch et al., 2003). Both maternal and paternal ages have been linked to increased likelihood of having a child with autism (Croen, Najjar, Fireman, & Grether, 2007).

In perhaps 25% of infertility cases, sperm is the cause of the problem. Three important features of sperm are quantity, quality, and motility. Some men have difficulty in sperm production (producing fewer than 10 million sperm per milliliter of semen). When quality is the issue, a high percentage of abnormal sperm are present. But the most common problem is poor motility. Despite the presence of 150 to 300 million sperm in a normal ejaculation, for some men, the sperm are unable to navigate their way the 3 to 4 inches up the fallopian tubes to fertilize the egg.

Today, multiple medical techniques are available to assist with fertility problems. Under the title of assisted reproductive technology (ART), embryologists have developed sophisticated techniques to help create children out of culture dishes. Beyond the use of drugs to regulate ovulation, there are three basic techniques (Schwartz, 2003):

1. **Intrauterine insemination (IUI)** is the most common procedure. Frozen sperm from either the husband or a donor is placed by a catheter directly into the uterus. This procedure could be used if the husband’s sperm count was very low or carried a genetic defect.

2. **In vitro fertilization (IVF)** has now also become a standard procedure to deal with blocked fallopian tubes and other problems, where an egg and sperm are combined in a petri (or culture) dish. The fertilized egg (zygote) is then transferred into the woman’s uterus. Several zygotes might be transferred at once. There are several variations of this basic technique involving the manipulation of eggs and sperm. Gamete intrafallopian transfer (GIFT) consists of inserting eggs and sperm, by way of a laparoscope, into the woman’s fallopian tube. Fertilization then takes place, and the resulting zygote(s) travels down into the uterus. Zygote intrafallopian transfer (ZIFT) is similar to GIFT, except fertilization occurs similarly to IVF, and the resulting zygote(s) is transferred to a fallopian tube. Intracytoplasmic sperm injection (ICSI) is one of the newest techniques. It is based on IVF but leaves even less to chance. A single healthy sperm is selected and then injected into a single female egg, using a microscopic glass needle. Once fertilization is confirmed, the zygote is inserted into the woman for implantation. Generally four fertilized eggs are inserted, with the expectation that not all will grow. However, sometimes they do!
3. Surrogacy is more ethically complicated because it involves a second woman. The particular role the woman plays could consist of contributing her eggs to the infertile couple, carrying a fertilized egg to term, or both. The sperm of the husband in the infertile couple is sometimes used to fertilize the egg through IVF procedures.

In conjunction with these techniques, if a prior pregnancy had revealed a genetic problem, preimplantation genetic diagnosis (PGD) is now performed by clinics around the country to identify potential genetic or chromosomal defects. Eggs are harvested and, using IVF, zygotes are formed. Each is then tested for certain genetic diseases. Typically, out of a group of 6 to 8 zygotes, several will be chosen to implant in the mother’s uterus.

ART is a new science; it was developed in the 1980s. The odds of successfully having a child through this technology are not high. The rates vary depending on the procedure, the particular clinic, and the characteristics of the woman’s eggs and the man’s sperm. Success rates (as determined by the birth of a normal child) range from 10% to 28%. In addition, high-tech medical intervention is not cheap. With the exception of IUI, which might only cost $300 per attempt, medication and procedures can cost from $6,000 to $12,000 for each attempt. And if none of the zygotes grow successfully, the procedure (and expense) is wasted. But some clinics are now offering a “guaranteed live birth plan”—at a cost that increases, of course, with maternal age and can reach over $30,000.

Genetic Defects

Each year about 120,000 neonates in the United States (3% of all births) are born with a birth defect—also known as a genetic disorder. The most common of these are heart defects, orofacial clefts (such as cleft palate), and Down syndrome (see Table 6.2). In addition, over 1,150 rare diseases (each found in fewer than 200,000 people) affect some 25 million Americans.

<table>
<thead>
<tr>
<th>Table 6.2</th>
<th>Most Common Birth Defects and Genetic Disorders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart defects</td>
<td>1 in 100 to 200</td>
</tr>
<tr>
<td>Orofacial clefts</td>
<td>1 in 700 to 1,000</td>
</tr>
<tr>
<td>Down syndrome</td>
<td>1 in 800</td>
</tr>
<tr>
<td>Neural tube defect</td>
<td>1 in 1,000</td>
</tr>
<tr>
<td>Autism spectrum disorders</td>
<td>3.4 to 6.7 per 1,000</td>
</tr>
</tbody>
</table>

Sources: Center for Disease Control and Prevention (http://www.cdc.gov/ncbddd/bd/default.htm); National Down Syndrome Society (http://www.ndss.org/).
Genetic defects include abnormalities at both the chromosomal and genetic levels. Humans normally have 22 autosomal chromosome pairs. They also have one pair of sex chromosomes; women have two X chromosomes, and men have one X and one Y. One chromosome from each pair is passed on to a child, so the child receives half from each parent. As this inheritance is taking place, however, defects in the process can arise. To determine whether a person has a chromosomal abnormality, the chromosomes are collected (through a blood sample), stained, and—to put it simply—photographed. The images are then arranged in pairs in what is called a karyotype (see Illustration 6.3).

Problems emerge for individuals born with abnormalities in the number or structure of their chromosomes. These abnormalities can usually be traced to preconception, when the egg or sperm was developing. The most common example of this is an extra chromosome. Down syndrome occurs when there is an extra 21st chromosome. The genetic abnormality results in particular facial features, some degree of mental impairment, and various health problems, such as heart defects.

When there is an extra X chromosome in males, their sex chromosome pair is a triad instead: XXY. This is known as Klinefelter syndrome and causes a variety of physical (e.g., small testicles) and behavioral problems (e.g., reduced fertility). Sometimes, a sex chromosome is missing, as in the case of Turner syndrome, where

Illustration 6.3  A karyotype of a healthy male.
a female has only one X chromosome. This syndrome results in such physical problems as short stature and a failure of the ovaries to develop. In some cases, just a portion of a chromosome is missing, such as with *cri du chat* (“cry of cat”) syndrome, where a deleted section of chromosome number 5 causes—along with other, more severe symptoms—a strange, high-pitched cry in babies.

Some 20,000 to 25,000 genes (the number is still being debated) are located on our chromosomes. Made up of amino acids, our genes are the blueprints of development. The full complement of genes in individuals is known as their genome. In 2003, the Human Genome Project, after a 13-year international endeavor, successfully identified each of the genes and their chromosomal location. The project has spawned nearly endless opportunities for biologists to analyze the results, and new discoveries will likely continue indefinitely. Even a single abnormal gene can cause a birth defect. For some genetic problems, if either parent has the faulty gene, the defect can be passed on to the infant. This is called dominant inheritance. Examples include a form of dwarfism called achondroplasia and a connective tissue condition known as Marfan syndrome.

Other genetic diseases are only inherited when both parents pass the same abnormal gene on to their child. Examples of this recessive inheritance include Tay-Sachs disease (a fatal nervous system disorder) and cystic fibrosis (a disorder of the lungs and other organs). Metabolic disorders, such as phenylketonuria (PKU), are usually caused by recessive genes. With X-linked inheritance, sons can inherit a genetic abnormality through their mother’s X chromosome. Hemophilia (a blood-clotting disorder) and Duchenne muscular dystrophy (progressive muscle weakness) are examples.

Some defects are due to a combination of more than one abnormal gene—or of both genetic and environmental causes. This is called multifactorial inheritance. Cleft lip or cleft palate, neural tube defects (e.g., spina bifida), and some heart defects are examples. Spina bifida, for instance, can be caused by genetic factors, as well as such environmental factors such as a high fever during pregnancy, a vitamin deficiency, or the mother’s use of a certain drug for treating epileptic seizures (see Spina Bifida Association’s Web site: www.sbaa.org).

There are more than 4,000 identified chromosomal and genetic disorders. Fortunately, most are extremely rare. The March of Dimes Foundation is an excellent source of information on this topic, and they are the source of the statistics cited in this chapter unless otherwise noted. Their Web site (www.marchofdimes.com) offers statistics, detailed descriptions, and references to further information. Another useful source of information is the National Organization for Rare Disorders (www.rarediseases.org).

Some disorders or potential birth defects can be identified during pregnancy using amniocentesis, chorionic villus sampling (CVS), or ultrasound. When defects are identified early enough in pregnancy, prenatal surgery can be performed to repair such problems as urinary blockages or certain heart defects. However, for most disorders, no treatment is available until the fetus is delivered. Still, early detection can allow parents and physicians to prepare for the child’s arrival.

Although there are few treatments available to cure birth defects, prospective parents can proactively minimize their likelihood. Women can prepare for
conception by cleansing their bodies of potential teratogens—including alcohol and tobacco—several months prior to possible pregnancy. Using a barrier method of contraception for several months—rather than a birth control pill—can also allow a woman’s body to purge itself of excess hormones. Men can help by improving the quality of their sperm. According to the Mayo Clinic in Minnesota (www.mayoclinic.com), men can increase their likelihood of making hardy, energetic sperm by taking multivitamins, reducing stress, getting regular exercise, and maintaining a healthy weight. Men should avoid toxins and recreational drugs, steroids, tobacco, and even hot tubs, hot baths, and saunas (the heat can lower the sperm count) for at least 70 days, as it takes this long for new sperm to complete their development cycle.

Miscarriages and Ectopic Pregnancies

Miscarriages are pregnancy losses that end before 20 weeks of gestation (after 20 weeks, pregnancy losses are called “stillbirths”). Miscarriages are very common; as many as half of all pregnancies are believed to end this way—often before the mother is aware she is pregnant. That is because most miscarriages occur early, before the 12th week. A wide range of issues—including chromosomal abnormalities, hormonal imbalances, uncontrolled diabetes, injuries to the abdomen, and substance abuse—can cause miscarriages. However, in a majority of cases, the cause is simply unknown.

Another relatively common pregnancy problem occurs when the fertilized egg implants outside the uterus, usually in the fallopian tube. This is called an ectopic (“out of place”) or tubal pregnancy and occurs in about 2% of pregnancies. The embryo is unable to survive and must be removed surgically in order to protect the mother’s health.

Labor and Childbirth

If all goes well, a pregnant woman, after about 40 weeks of pregnancy, will begin to feel frequent and regular contractions. These contractions cause the cervix to shorten and dilate in preparation for delivery. The average labor lasts 12 to 14 hours for the first baby but is often shorter for subsequent children. When the contractions are between 5 and 10 minutes apart, it is time to go to the hospital or birthing center or—for about 1% of women—to prepare for a home birth.

Vaginal childbirth is divided into three stages. Stage 1 is the labor phase. This stage lasts until the cervix dilates to about 10 centimeters. These contractions may seem like strong menstrual cramps to some women, but for others they are shockingly painful. The comedian Bill Cosby, based on what he has observed as a veteran of five births, likened his wife’s labor pain to grabbing your lower lip and pulling it over your head! Stage 2 involves pushing and delivery. This stage may take from a few minutes to a few hours. Stage 3 consists of expulsion of the placenta and lasts from 10 to 60 minutes. In all, a vaginal birth can take 12 hours or more.
In the United States, it is common for couples to choose a childbirth method. The two most common ones are Bradley (also called husband-coached) and Lamaze. Both approaches use classes to teach various ways of coping with the pain, such as relaxation techniques and deep-breathing exercises. The Bradley method aims to avoid the use of pain medications unless absolutely necessary, whereas the Lamaze approach is neutral on the issue. The Bradley method also involves the baby's father as birth coach and focuses on good nutrition and exercise during pregnancy.

When pain medication is needed, two types of drugs may be used: analgesics or anesthesia. Analgesics are injected or given intravenously to relieve pain without the total loss of feeling or muscle movement. Anesthesia, including spinal and epidural blocks, is given intravenously and temporarily stops all feeling in an area. The disadvantage of this medication is that it reduces the ability to control muscles, so a woman's pushes might be less helpful to the birth process. The most extreme form of pain management is general anesthesia, resulting in loss of consciousness of the woman, sedation of the fetus, and additional risk to both.

The single greatest risk to a child during delivery is experiencing a shortage of oxygen (hypoxia) or total lack of oxygen (anoxia). Depending on the degree and duration of the intruterine hypoxia, the fetus can suffer brain damage or death. Consequently, prior to delivery, a monitor is attached to the fetus' head to monitor the oxygen content of his or her blood and to watch for fetal distress. The most common cause of hypoxia is compression of the umbilical cord during delivery. This may then necessitate a cesarean (C-section) delivery.

C-sections involve surgically cutting the abdomen and uterus in order to remove a baby. The procedure might be recommended for many different reasons, including a baby with his or her rear end leading the way down the birth canal, in breech position (feet first), a birth of multiple babies, an otherwise problematic delivery, and increasingly, for convenience and reduction of childbirth pain. In 2004, almost one third (29.1%) of the more than 4 million childbirths in the United States were C-sections (Martin et al., 2006). This rate reflects a 41% increase from 1996 when the percentage was 20.7%. However, the World Health Organization has stated that the rate of C-sections should be 10 to 15%. When the rate is below 10% or above 15%, maternal mortality increases.

Women undergoing C-sections are given epidural anesthesia, so they are awake but do not feel any pain. Childbirth then takes only 5 to 10 minutes, but it is considered major surgery. C-sections are considerably more expensive than vaginal births (see Illustration 6.2), introduce new risks to the mother (such as infection), and require more time to heal. However, the procedure does have certain advantages, such as it can be scheduled, it requires a total of 20 minutes to perform, and it lowers the risk of birth-related litigation associated with hypoxia and other birthing problems.

The rate of C-sections in the United States has increased dramatically. However convenient the operation may be, C-sections are not better for babies. Based on a sample of more than 5.5 million births, the neonatal mortality rate was found to be 1.77 per 1,000 live births with C-sections but only 0.62 per 1,000 with vaginal deliveries (MacDorman, Declercq, Menacker, & Malloy, 2006). Vaginal births release
hormones in the neonate that promote healthy lung function; physically compress the baby during labor, thereby removing fluid from the lungs; prepare the mother for breastfeeding; and do not carry the risk of cutting the baby, something that can occur during a C-section operation.

The Preterm Newborn

Each year, more than 4 million neonates are born in the United States (4.27 million in 2006) (U.S. Census Bureau, 2008). The average newborn weighs in at 7.3 lb. (3316 g) and is about 20 in. long (Martin et al., 2006). However, there is a wide variability in the weight of newborns. The heaviest newborn was delivered in Italy and tipped the scales at 22 lb. 8 oz., according to the Guinness Book of World Records (Glenday, 2006).

At the other end of the scale are newborns that are thought of as premature. To be accurate, a newborn is premature only if he or she is born prior to 37 weeks of gestation (according to the World Health Organization, 2002). Some babies are born having a low birth weight, but they are not necessarily premature. A low-birth-weight baby weighs less than 5.5 lb. (2,500 g). These infants are sometimes subdivided into “moderately low birth weight” (3.3 to 5.5 lb. or 1,500 to 2,499 g) and “very low birth weight” (less than .3 lbs. or 1,500 g). In 2005, 8.2% of infants were classified as low birth weight and 1.1% with very low birth weight (U.S. Department of Health, 2008). However, the percent of low birth weight African American newborns is 14.0, more than twice the rate of 6.9% found in non-Hispanic Whites.

The relative number of births of multiples (twins, triplets, etc.) has risen dramatically since 1994, largely due to a rise in fertility treatments. Still, only 3.4% of births involve multiples. These infants are six times more likely to arrive preterm than are singletons (Martin et al., 2006).

Prematurity is associated with a variety of health problems, including increased risk of death. The earlier the birth, the greater the risk. Some risk factors for preterm delivery include an adolescent mother, smoking, a previous preterm birth, a birth of multiples, a mother with medical conditions, and high levels of stress. The annual societal economic cost (medical, educational, lost productivity) associated with preterm birth in the United States is more than $26 billion per year (Behrman & Butler, 2007).

Transitioning to Parenthood

Newborns require almost constant care. They must be fed every few hours. After feeding, they need to be burped. They cry a lot; on average, newborns cry 2 hours a day. Their diapers need to be changed frequently—or they will develop diaper rash and cry even more. Newborns wake up every few hours during the night to be fed. When not sleeping or eating, they need stimulation, or they will get bored—and cry. Once entertained, they need time to wind down, or they will get overstimulated
and—you guessed it—cry. As gratifying and joyful as parenthood is, it also represents a major life change that is stressful and, for most parents exhausting.

Consider some of the many time-related adjustments that must be made. Overnight, the entire focus and structure of the parents’ routine changes and becomes centered on the newborn. This necessitates changes in how time is spent both in and outside the home. Many new mothers stop working outside the home, whether for a few weeks, months, or many years. This does not mean the mothers are not working. Some studies find that new mothers spend the equivalent of 80 hours or more working in the home. The amount of time spent with children is most directly a function of parental employment status. For example, parents who do not work outside the home spend an average of 63.8 hours with children, versus 49.4 hours for those who work part-time, and 36.5 hours for those working full-time (Milkie, Mattingly, Nomaguchi, Bianchi, & Robinson, 2004).

In the United States, few employers provide paid maternity leave. So, most families with newborns face a decrease in family income. To make up for that lost income, some fathers opt to work longer hours or take on a second job. Sometimes new mothers do not have the choice but must return to work within weeks after childbirth. Achieving a balance between work and home represents a considerable challenge for both parents. It requires, among other things, communication, negotiation, and consideration.

Another set of adjustments concern personal identity. Suddenly, the wife and husband have new labels: mother and father. In a longitudinal study of 96 couples who became parents (Cowan & Cowan, 1992), participants were asked during pregnancy to identify their different identities and what proportion each identity occupied. Common identities for the women included partner/lover, worker, friend, daughter, and mother. Illustration 6.4 shows the decline both parents experienced in their identity as partner/lover, from before the baby was born to 6 months after birth. As is evident, the partner/lover aspect of identity gets squeezed out.

With the decreased time and energy devoted to their partners, new parents are likely to report a decline in marital satisfaction. For example, a recent investigation into the topic replicated the common finding that marital satisfaction decreases after the birth of a child, in comparison to couples who did not have a child (Lawrence, Rothman, Cobb, Rothman, & Bradbury, 2008). This decline is shown in Illustration 6.5. However, the decline was not so severe in couples who had planned for the child and couples with higher levels of marital satisfaction.

The decline in satisfaction is due to a variety of reasons, such as fatigue, stress, and reduced intimacy among parents. An additional cause can be the low levels of paternal involvement in child care. The key factors that are believed to drive fathers’ involvement in child care are motivation, skills (and self-confidence), and the marital relationship, along with social supports (Pleck & Masciadrelli, 2004). Paternal motivation can be influenced by a variety of considerations: the child’s gender (some fathers are more motivated to interact with sons than daughters), whether they have a biological relationship to the child, the extent to which their own father was involved, whether fatherhood is tied to their identity, and of course their beliefs. Some men may model their own father’s involvement level, whether
Illustration 6.4  Role Changes With the Onset of Parenthood


Illustration 6.5  Decline in Marital Satisfaction

Source: Based on Lawrence et al., 2008.

Notes: Time 1 = 3 months after marriage
Time 2 = 1 month prebirth*
Time 3 = 6 months postbirth*
Time 4 = 12 months postbirth*
* For couples who did not have children, a comparable duration in time was used for this assessment.
high or low. Other men may be unhappy with their own father’s lack of involvement and seek to compensate.

Mothers can also play a key role in paternal involvement. Some mothers are happy to teach (if necessary) their husbands some of the child-care skills, such as changing diapers, a skill they probably learned while babysitting during adolescence. However, some mothers are reluctant to let their husbands engage in any child-care responsibilities. These “gatekeeper” mothers tend to have traditional conceptions of family roles, they set rigid standards for father involvement, and they regard child care as exclusively their role. In one study, 20% of mothers were classified as gatekeepers (Allen & Hawkins, 1999).

Parenting the Newborn

In their role as parents of a newborn, mothers and fathers must perform a variety of mundane recurrent tasks (or face charges of child neglect), including feeding, clothing, diapering, comforting, and stimulating. These tasks require learning caregiving techniques that work with that particular child, often through trial and error. Fortunately, newborns are forgiving. They are also quick to inform parents about caregiving mistakes and when their needs are not being met. For first-time parents,
it is a gradual process of learning about how to care for an infant as well as understanding that particular infant’s needs and personality.

In contrast to a gradual learning process, two pediatricians proposed a provocative idea in the late 1970s about the importance of the time right after birth of a newborn. Their idea was that there existed a critical but short period of time right after childbirth when parents fall in love with their baby. Their idea and research investigations into it are described in Box 6.1.

Although bonding, per se, has not proven to be a valid construct, the development of a bond between the mother and newborn, as well as father and newborn, is an important postpartum task. The development of that close, loving relationship is promoted by parental sensitivity and, for mothers, breastfeeding. In contrast, it can be inhibited by postpartum depression. These topics will be briefly considered next.

**Box 6.1**

**The Fiction of Mother-Infant Bonding at Birth**

As important as it is to begin to form a loving relationship with a newborn child, two pediatricians got carried away with the idea. In 1972, Marshall Klaus and John Kennell along with colleagues published an experimental study in the prestigious *New England Journal of Medicine*. They argued that there was a sensitive period of development shortly after birth when the mother was uniquely open for bonding with her new infant. If the mother did not have the opportunity to bond with the newborn—perhaps the neonate was premature and had to be placed in an incubator—then they argued the mother would not be able to bond with the child. To support their theory, they conducted an experimental study with 28 low-income, unmarried, primiparous mothers (first-time mothers). Half the mothers were randomly assigned to the experimental group where they were given their newborn right after birth for an hour plus an additional 5 hours of contact on each of the next three days. The other group formed a traditional care group. Their exposure to their infants was limited to every 4 hours when they fed the babies. One month later, all the mothers participated in an interview and a video-taped observation of how they fed their infant.

According to the article, support for their hypotheses was found. On two of the interview questions, the mothers in the extended contact group were more likely to respond in the bonded way; similarly in 2 of the 25 behaviors that were coded, the extended contact showed more looking at the child with their faces opposite each other and more time fondling the baby. The study and concept received a great deal of attention and resulted in changes to hospital postpartum procedures. No longer were babies whisked away to the newborn ward. Instead, healthy newborns were kept with their parents until discharge, usually about one day after birth. However, the original study contained a number of serious methodological problems (Lamb, 1982), and other researchers were largely unable to replicate the results (Grossman, Thane, & Grossman, 1981). In a book examining the bonding research, Eyer (1992) concluded that the concept is “scientific fiction.”
Parental Sensitivity

The process of effectively performing common child-rearing tasks is captured by the construct of sensitivity (also called responsivity), as was mentioned in Chapter 3. Both John Bowlby and Mary Ainsworth recognized the importance of this quality of parenting in their Attachment Theory. Sensitive parenting requires attunement to the infant child’s cues and quick and appropriate responses. Sensitivity can be readily observed when an infant becomes distressed due to a need (such as hunger) or perhaps a fear. Three key indicators of a parent’s sensitivity are how rapidly the parent responds, the dependability of the parent’s response, and how successful the parent is at comforting the child. Being a sensitive caregiver requires attentiveness, empathy, correct interpretation of the infant’s cues, and nonintrusiveness combined with emotional availability (Biringen & Robinson, 1991; Lamb & Easterbrooks, 1981). Sensitive parents are able to quickly relieve their children’s anxiety and fears by offering emotional comfort. They also respond to their infants in a flexible and balanced way so, for example, the parent is not overbearing or perhaps frightening to the infant (Solomon & George, 2008).

Breastfeeding

Whether or not to breastfeed a newborn is one of the first decisions a mother must make. On the face of it, it is not a difficult choice. Breastfeeding an infant has a number of advantages. It requires close contact with the newborn and thus promotes the development of the mother-child relationship. The American Academy of Pediatrics issued a policy statement in 2005 endorsing the practice:

Extensive research, especially in recent years, documents diverse and compelling advantages for infants, mothers, families, and society from breastfeeding and use of human milk for infant feeding. These include health, nutritional, immunologic, developmental, psychological, social, economic, and environmental benefits. (p. 1035)

Breast milk helps protect against infectious diseases that cause such problems as diarrhea, otitis media (inflammation of the middle ear), and respiratory infections. In this way, it reduces the risk of infant death. It also decreases the likelihood the child will develop diabetes, obesity, or asthma. Mothers themselves also benefit from breastfeeding, because it costs nothing (other than the cost of a little more food for the mother), helps them lose excess weight more readily, and reduces the risk of certain types of cancer.

Despite such endorsements, a surprisingly large number of mothers do not breastfeed their infants. In the United States, only about 70% of newborns are breastfed right after birth. That percentage drops to 34% by 6 months of age and 15.7% at age 1 (Centers for Disease Control and Prevention, 2007), though children can be healthily breastfed well beyond that age.

There are a variety of reasons that some mothers choose not to breastfeed. They might experience insufficient milk supply, breast or nipple pain, embarrassing leakage
of milk, or mastitis (inflammation of the breasts most commonly caused by blocked milk ducts). Other mothers find it unpleasant, difficult, time-consuming, or too inconvenient, as it requires feeding young infants every 3 to 4 hours during the daytime (Schwartz et al., 2002; Taylor, Risica, & Cabral, 2003).

Given that the advantages of breastfeeding far outweigh the disadvantages, the United States Department of Health and Human Services has made it a goal by 2010 to increase the number of breastfed babies to 75% during the first 6 weeks after birth, 50% at 6 months of age, and 25% at age 1 (see Breastfeeding Report Card at www.cdc.gov/breastfeeding/data; also Illustration 6.7). However, that goal may be lofty. The most difficult to convince will be adolescent mothers, lower income/less educated mothers, and African American mothers. All these groups of women have significantly lower rates of breastfeeding than do other mothers (Centers for Disease Control and Prevention, 2007). Mothers of unintended births are also less likely to breastfeed (Gipson, Koenig, & Hindin, 2008).

Postpartum Depression

About 13% of births (even of healthy babies) are accompanied by an unwelcome complication: postpartum depression in the mothers (O’Hara & Swain, 1996). This condition is more serious and persistent than “baby blues,” a feeling of letdown...
experienced by a majority of new mothers, but subsides in a few days. Postpartum depression, which can occur anytime during the first year of a baby’s life, lasts 2 weeks or longer and is accompanied by symptoms such as sadness, insomnia, lack of interest, feelings of guilt, low energy, changes in appetite, restlessness, mood swings, and in more extreme cases, thoughts of suicide. Mothers of unintended children are more at risk for depression (Gipson et al., 2008). The condition can be dangerous for the baby. The mother suffering from this syndrome may not be able to breastfeed or adequately care for her newborn.

In rare cases, mothers suffer from “postpartum psychosis” characterized by the loss of ability to discern what is real and what is not. In this case, the mother may experience delusions, hallucinations, sleep disturbances, and have obsessive thoughts about the baby. These mothers are at risk for injuring or even killing their babies (Huysman, 2003). This problem was brought to the public’s attention most dramatically in 2001 when Andrea Yates drowned her five children in a bathtub.

Fortunately, under appropriate medical care, postpartum depression and psychosis can be treated. The two most common treatment techniques are involvement in support groups and the use of antidepressants. Selective serotonin reuptake inhibitors—marketed under such names as Zoloft, Paxil, and Prozac—have proven to be generally effective treatments (Wisner, Parry, & Piontek, 2002).

The Problem of Infant Mortality

As the theologian Dietrick Bonhoeffer, who died in a Nazi concentration camp, once observed, “The test of the morality of a society is what it does for its children.” One of the measures of that test is how often newborn children die. Recall from Chapter 1 that in 17th-century New England, the rate of infant mortality ranged from 10% to 33%. Today, infant death rates are calculated not per hundred but per thousand—indicative of the dramatic decrease in infant deaths achieved over the past 400 years.

The year 2004 was a landmark year for the United States, because that year the infant mortality rate declined to its lowest level on record: 6.78 per 1,000 live births (U.S. Census Bureau, 2008c). This translates to about 28,000 infant deaths per year. The rate has dropped precipitously over the years, due to improved health and medical care. For example, in 1900 the rate was 100 deaths per 1,000 births but declined to 47 deaths per 1,000 by 1940. However, there are glaring racial differences. The infant mortality rate for African American women (in 2005) was 13.6 per 1,000 births, more than double the rates of 5.7 for European American women, and 5.8 for Hispanic women (MacDorman & Matthews, 2008). Why the discrepancy? Primarily, it is a reflection of poverty and its associated problems, such as lack of prenatal care, poor health, and lifestyle choices, such as drinking and smoking. There is also evidence that the gender of the child and whether or not the child was planned are risk factors (Gipson et al., 2008).

Surprisingly, the United States does not compare very favorably with the infant mortality rates of many other countries. Although the United States is the richest nation in the world as defined by per capita income, in 2005, 28 countries reported lower rates of infant mortality. All the European nations have lower rates than the
United States, whose rate was three times higher than that of the city-state with the lowest rate—Hong Kong. See Illustration 6.8 for a listing of the top 10 countries or city-states in comparison to the United States.

Why does the United States have such a relatively high rate of infant mortality? The causes are well known: poverty, lack of education, and a lack of prenatal care, often due to no health insurance. The solutions are clear, but they are difficult to implement. Foremost, all pregnant women need prenatal care, including four important services:

1. Screening and treatment for medical conditions, such as diabetes, HIV, and obesity
2. Managing of chronic health conditions, including an update of vaccinations and a review of current medications that could be teratogens
3. Identifying any behavioral risk factors—such as smoking, alcohol, and poor nutrition—and intervening if possible
4. Prescribing prenatal vitamins with folic acid in order to prevent neural tube defects and other problems

Most American pregnant women (84%) receive prenatal care during their first trimester (U.S. Department of Health, 2008). Another 12.5% begin care during their second trimester. However, 3.6% of women receive late or no care. African American women are more than twice as likely as non-Hispanic White women to receive late or no prenatal care. In addition, being an adolescent, unmarried, and having low educational attainment are other risk factors for receiving late or no prenatal care. Women in this last group are the most likely to experience infant mortality.

Illustration 6.8 Infant Mortality by Nation or City-State in 2004

Source: MacDorman & Matthews, 2008
In addition to ending poverty, providing prenatal health care, and increasing education, another strategy designed to reduce infant mortality is to introduce national newborn-screening standards, as recommended by the American College of Medical Genetics (ACMG). The ACMG claims that 29 conditions should be screened for, because with early identification can come early treatment that may avoid potentially serious or fatal heath problems. The recommended tests are for certain genetic, metabolic, hormonal, and functional (in this case, hearing) conditions. Except for the hearing assessment, the tests are conducted on a few drops of blood taken from the newborn’s heel. Opponents to the screening standards fear the consequences of a loss of privacy and unfair labeling of children, especially in the case of false-positive results.

You can find a reminder of the importance of newborn screening in a mundane place—the diet soda can. Most cans of diet soda (those containing aspartame) have a warning in small print: Contains phenylalanine. A small number of children (1 in 13,500 to 19,000) are born with the genetic disorder phenylketonuria (PKU). Children with this disorder cannot metabolize phenylalanine due to a missing enzyme. So for them, too much phenylalanine can result in brain damage. However, through a carefully controlled diet, the appropriate level of phenylalanine in the blood can be maintained and infants can develop into healthy children and adults. Currently, all states screen for PKU, but in 2008 only 11 states (Alaska, Delaware, Iowa, Maryland, Minnesota, Mississippi, New Mexico, New York, Rhode Island, Virginia, and Wyoming) and the District of Columbia screen their newborns for all 29 conditions as recommended by the ACMG.

**Ethical Issues**

Dramatic and rapid changes in medical technology have given many previously infertile couples the ability to have biological children. However, the advent of reproductive technology has also raised a number of unprecedented ethical and moral questions. Here are just five of the many thorny questions that individuals and society are now or soon will be dealing with:

**Genetic Testing**

*Should people know their genetic profile?* Knowing one’s genetic profile can lead to early detection and better treatment of hereditary disorders. It can help in making major life decisions, such as what type of occupation to pursue. For example, if you knew you carried genes linked to the early onset of Alzheimer’s disease, with symptoms appearing as early as age 30, you probably would not want to go to graduate school. Couples can use their combined genetic profiles to predict what illnesses their children might face and take steps to prepare for or avoid certain outcomes.

But the very presence of this genetic information has its dangers. It could be disseminated, violating an individual’s privacy. What if your employer found out that you have the gene for a late-onset debilitating illness? What if your insurance company discovered your hidden abnormality? The potential for discrimination is very
real. Consequently, Congress has been debating the topic for years. Finally, in May 2008, the Genetic Information Nondiscrimination Act (GINA) was signed into law. The law is intended to allow Americans to take advantage of genetic information and treatments without the fear of their genome being used against them.

**Designer Babies**

*Should parents be allowed to select the features and characteristics they want in a child including known defects?* Sperm banks now let prospective parents select features they desire in the child. To increase your chances of a blond child, select a blond-haired donor. But is any feature acceptable to select? According to an article in the *New York Times*, in 3% of cases, parents have selected embryos with a genetic defect. These parents, including deaf and short-stature individuals, desire a child who shares their disability (Sanghavi, 2006).

**Cloning**

*Should parents be allowed to clone themselves or someone else?* Cloning technology is improving rapidly; many believe it will not be long before it is possible to clone a human. Are there any circumstances that would merit a human cloning? What if an only child died in an accident and the parents were too old to have another? Or consider this scenario: a world-class athlete and his nonathletic, petite wife desire a child as gifted as his father. Would not cloning be a much more efficient route than fertilization?

**Prenatal Screening**

*Should anyone be allowed to fertility services—even if they might not provide adequate child rearing?* What if a pedophile wants help having his own child? The Ethics Committee of the American Society for Reproductive Medicine (2004) recommends that fertility programs develop procedures for assessing a patient's child-rearing ability. According to the society, no one should be discriminated against, and persons with disabilities should not be denied services except when there is a well-substantiated basis indicating they will not provide adequate child care. But again, where would we draw the line?

**Age Discrimination**

*Is it an individual's right to bear children at any age?* Medical procedures now enable women to bear children into their 60s; the oldest recorded woman to bear a child was 70 (see Box 6.2). Even without medical intervention, some men continue to father babies as septuagenarians. This practice of fooling nature raises various ethical questions. When is an individual too old to parent? Is it morally wrong to impose on a child a parent who will have serious physical limitations due to aging or who will likely die before the child reaches adulthood? Or is it a greater offense to set age-related restrictions on prospective parents?
Parenthood represents a major life change as well as a long-term financial commitment, however many individuals find themselves on the road to parenthood without much forethought. Other couples seek to have children but encounter various medical problems either in trying to get pregnant or during pregnancy. Medical advances made by embryologists in the area of Assisted Reproductive Technology have resulted in a variety of techniques that give hope to many infertile couples. Genetic defects, present in 3% of childbirths, are another hazard for prospective parents.

Typically, after 38 weeks of pregnancy, the woman goes into labor and delivers the newborn. Children who are born premature are at risk for a variety of problems. The arrival of the newborn results in many adjustments for the parents, in the areas of finances, roles, stress levels, and marital satisfaction. Couples who plan ahead and have good relationships experience less of a decrease in marital satisfaction.

Caring for the physical needs of the newborn is the central task for new parents. Sensitive caring promotes the development of secure attachment with the child. However, postpartum depression afflicts some new mothers. The variability in rates of infant mortality around the world highlights the degree to which different societies have developed policies and cultural practices that are hospitable for the healthy development of newborns. Society is also increasingly being confronted with ethical issues created by medical advances intended to help infertile couples. Several questions are raised about who should become parents and what procedures should they be allowed to use.

**BOX 6.2**

Too Old to Parent?

A lot of attention has been devoted to the problem of teenage parenthood, as will be discussed in a subsequent chapter. It is now well known that many problems can occur for both parent and child when young teenagers have children. But what about child bearing and child rearing at the other end of the age spectrum? When is a parent too old to be a new parent? The new record was apparently set by a 70-year-old woman from Mumbai, India, according to news reports in the summer of 2008. She and her 75-year-old retired farmer husband were desperate to have a male heir. So they spent their life savings and took out a loan to fund in vitro fertilization procedures. The septuagenarian mother delivered, by an emergency C-section, a healthy boy and girl. Imagine these twins’ first day of kindergarten—with a 75-year-old mom. Or picture the mother as an 88-year-old, dropping off her teenagers for their first day of college. The former Senator Strom Thurmond from South Carolina, who lived from 1902 to 2003, topped that. He fathered four children with his much younger wife, beginning when he was 68 years old. These unusual cases raise the question, should there be age limits on medically assisted pregnancies?
• At some point in your life do you want to have children? If so, why? What do you see as the benefits and drawbacks?
• Do you think couples wanting to have a child should routinely be genetically screened to identify potential problems? What are the pros and cons of such an idea?
• How can positive parenting behaviors of newborns, such as breastfeeding and sensitively responding to infant cues, be promoted in new mothers?
• Should there be any ethical limits set on who can parent or by what medical means?