Chapter Preview

Anticipating the birth of a child is one of life's most enriching experiences. The period of prenatal development is a time of incredibly rapid growth during which the emerging person develops from a single cell into a fully functioning individual. This development is outlined in Chapter 4, followed by a discussion of the birth process, the most radical transition of the entire life span. No longer sheltered from the outside world, the fetus becomes a separate human being who begins life almost completely dependent upon its caregivers. Chapter 4 is also concerned with the process of birth, as well as possible variations and problems.

The third section deals with some of the problems that can occur—among them prenatal exposure to disease, drugs, and other hazards—and the factors that moderate the risks of teratogenic exposure. One particularly significant problem is low birthweight, which is generally linked to maternal malnutrition and drug use.

The chapter concludes with a discussion of the significance of the parent–newborn bond.

What Have You Learned?

The “What Have You Learned?” questions at the end of the text chapter are reprinted here for your convenience in checking students’ understanding of the chapter contents.

1. What are three critical developments during the germinal period?
2. What events begin and end the embryonic period?
3. What occurs about halfway through the fetal period?
4. Why does pregnancy continue months after the fetus could live outside the uterus?
5. Why has the Apgar scale increased the survival rate of newborns?
6. Why has the rate of cesarean sections increased?
7. Why are developmentalists concerned that surgery is often part of birth?
8. Why is the newborn mortality rate much higher in some countries than in others?
9. What are the differences between the role of the doula and that of the doctor?
10. What teratogens harm the body structure of the developing person?
11. What teratogens harm the brain of the developing person?
12. How does timing affect the risk of harm to the fetus?
13. Why does risk analysis not predict precise damage to a given fetus?
14. What factors increase or decrease the risk of spina bifida?
15. What are the differences between LBW, VLBW, and ELBW?
16. What are the reasons a baby might be born a month or more before the due date?
17. How and why have LBW rates changed in the United States in the past decade?
18. What are the long-term consequences if a very tiny or vulnerable newborn survives?
19. What causes cerebral palsy?
20. What do newborns do to aid their survival?
21. What role do fathers have during and immediately after birth?
22. How do fathers affect pregnancy?
23. What are the causes of postpartum depression?
24. What affects the parent–infant bond?
25. What happens if a mother does not see her newborn until several days after birth?

Chapter Guide

- “On Your Own” Activities: Developmental Fact or Myth?; Folk Wisdom and Pregnancy; Portfolio Assignment
- AV: Transitions Throughout the Life Span Program 4: The Wondrous Journey
- Teaching Tip: Covering Sensitive Topics
- Classroom Activity: The Evolutionary Perspective on Prenatal Development
- Observational Activity: Pregnancy's Impact on Expectant Parents

I. Prenatal Growth

**Instructional Objective:** To outline the rapid and orderly development that occurs between conception and birth.

- AV: Life's Greatest Miracle; Developmental Phases Before and After Birth; Prenatal Development; Prenatal Development: A Life in the Making; Psychological Development Before Birth; Nature's Child: Biological Growth; Pediatric Brain Development: The Importance of a Head Start
- Classroom Activities: Birth and Prenatal Development Resources on the Internet; Fetal Ultrasound: “The Best Physical You’ll Ever Have”

1. The first two weeks of prenatal development are called the **germinal period**. Soon after conception, the one-cell zygote begins to duplicate, divide, and differentiate.
2. The resulting cell mass soon separates into two distinct masses, one inside the other. The outer cells will become the **placenta**; the inner cells form a nucleus that will become the **embryo**.
3. If all goes well, **implantation** of the cell mass occurs. At least 60 percent of all natural conceptions and 70 percent of all in vitro conceptions fail to become properly implanted, thereby terminating the pregnancy.
4. The **embryonic period** begins in the third week as the formless mass becomes a distinct being, now referred to as the **embryo**.
5. A thin line down the middle of the outer layer of cells (the **primitive streak**) forms a structure that becomes the neural tube, then the brain and spinal column (the central nervous system).
6. In the fourth week, the cardiovascular system is functioning; the eyes, ears, nose, and mouth start to form. At five weeks, the arm and leg buds appear.
7. By the end of the second month, the developing organism weighs about 1 gram (1/30 ounce), is 2 1/2 centimeters (1 inch) long, and has all the basic organs and body parts of a human being (except the sex organs).
8. Prenatal development is cephalocaudal, meaning that it proceeds from “head to tail,” and proximodistal, or from “near to far.” By the end of the third month, the sex organs are visible on an **ultrasound** (also called a **sonogram**).
9. During the **fetal period**, if the **fetus** is male (XY), the SRY gene on the Y chromosome signals the development of male sex organs. If the fetus is female (XX), no signal is sent, and the fetus begins to develop female sex organs. Most functions of the brain are gender-neutral; some sex differences in brain organization occur in mid-pregnancy.
10. At the end of the third month, the fetus has all its body parts, weighs approximately 3 ounces (87 grams), and is about 3 inches (7.5 centimeters) long.

11. In the middle three months, the systems develop more fully. The crucial factor in the fetus’s attaining the age of viability, beginning at about 22 weeks, is brain maturation, which is essential to the regulation of basic body functions, such as breathing and sucking. The brain develops new neurons in a process called neurogenesis and new connections between them in a process called synaptogenesis.

12. Weight gain during the final three months is about 4½ pounds (2.1 kilograms). The neurological, respiratory, and cardiovascular systems mature dramatically; and brain growth is so extensive that the brain’s cortex must fold into layers in order to fit into the skull.

II. Birth

Instructional Objective: To help students understand the birth process, the method used to assess the newborn’s physical condition, and the differences between natural and medically assisted births.

- AV: The Journey Through the Life Span, Program 1: Birth; Newborn; The Process of Birth; Pregnancy and Birth: Caring and Preparing for the Life Within; Understanding Pregnancy; Birth Without Violence; Birth at Home; The Newborn; The Story of Eric; Some Babies Die
- Classroom Activities: Preparing for Birth; Are Vaginal Births Best? Classroom Debate: “Resolved: The Increasing Medicalization of Birth Is Harmful to Both Mothers and Their Babies”; Midwifery and Doulas
- “On Your Own” Activities: Reading About Birth; Birth in Fiction and Film
- Critical Thinking Activity: Medical Attention

1. Birth usually begins at about 38 weeks after conception, when the fetus’s brain signals the release of hormones, specifically oxytocin, that trigger uterine contractions in the mother. The baby is born, on average, after 12 hours of active labor for first births and 7 hours for subsequent births.

2. The Apgar scale is used to assign a score between 0 and 2 to the newborn’s heart rate, breathing, muscle tone, color, and reflexes at one minute after birth and again at five minutes. A score of 7 or better indicates the newborn is not in danger; below 7, that the infant needs help in establishing normal breathing; and below 4, that the baby is in critical condition and needs immediate medical attention.

3. The quality of the birth experience depends on many factors, including the parents’ preparation for birth, the skill of the birth attendants, the position and size of the fetus, and the customs of the culture.

4. Cesarean sections now account for more than one-third of U.S. births. Only 1 percent of U.S. births take place at home. Home births are usually normal and healthy, but they risk complications, and hospital births risk too much intervention.

5. Many North American mothers today use a professional birth coach, or doula, to assist them.

III. Problems and Solutions

Instructional Objective: To make students aware of teratogens that may affect prenatal development, as well as factors that may help prevent complications.

- AV: Pregnancy: Caring for Your Unborn Baby; Teenage Pregnancy; Pregnancy After 35; 39, Single, and Pregnant; DES: The Timebomb Drug; Pregnancy and Substance Abuse; Fetal Alcohol Syndrome and Other Drug Use During Pregnancy; David with Fetal Alcohol Syndrome; Fetal Alcohol Syndrome: Life Sentence; One for My Baby (Fetal Alcohol Syndrome); Having a Mentally Handicapped Baby; Prenatal Diagnosis: To Be or Not to Be
- Classroom Activities: The Role of Nutrition in Prenatal Development; Frequent Drinking Among Pregnant Women; Classroom Debate: “Resolved: A Fetus Has the Same Moral and Legal Rights as Its Mother”; Low-Birthweight Risk Factors
- “On Your Own” Activity: Avoiding Teratogens in Your Life
- Internet Activity: Clinical Teratology

1. Teratology is the study of birth defects. Teratogens include such substances or conditions as viruses, drugs, chemicals, stressors, and pollutants that can impair prenatal development.
development and lead to birth defects, even death. Teratogens that tend to harm the prenatal brain are called behavioral teratogens. Approximately 20 percent of all children have behavioral difficulties that could be related to behavioral teratogens.

2. Teratology is a science of risk analysis, which attempts to evaluate what factors can make prenatal harm more, or less, likely to occur.

3. Three crucial factors that determine whether a specific teratogen will cause harm, and of what nature, are the timing of exposure, the amount of exposure, and the developing organism’s genetic vulnerability to damage from the substance.

4. Although each body structure has its own critical period during which it is most susceptible to teratogenic damage, for behavioral teratogens that affect the brain and nervous system the entire prenatal period is critical.

5. Some teratogens have a cumulative effect on the developing individual. For other teratogens, there is a threshold effect; that is, the substance is virtually harmless until exposure reaches a certain level.

6. A deficiency in folic acid in the mother’s diet may also result in neural-tube defects. These also occur more commonly in certain ethnic groups.

7. Large doses of alcohol can trigger the physical, behavioral, and mental symptoms of fetal alcohol syndrome (FAS). FAS is the leading known prenatal cause of birth defects and mental retardation.

8. Low birthweight (LBW) is defined as birthweight that is less than 5 1/2 pounds (2,500 grams). Babies who weigh less than 3 pounds, 5 ounces (1,500 grams) are classified as very low birthweight (VLBW); those who weigh less than 2 pounds, 3 ounces (1,000 grams) are classified as extremely low birthweight (ELBW).

9. Low-birthweight infants who are born 3 or more weeks early are called preterm. Others, born close to the due date but weighing less than most full-term newborns, are called small for gestational age (SGA).

10. Maternal illness, drug use (especially smoking), and malnutrition are common causes of low birthweight. Other causal factors include poor health habits (including drug abuse) and the mother’s youthful age (mostly because of teens’ poor eating habits). Assisted reproduction also increases the risk of low birthweight.

11. Birth complications are more likely if the fetus is already at risk because of low weight, preterm birth, genetic abnormality, or teratogenic exposure or because the mother is unusually young, old, small, or ill.

12. Researchers now realize that cerebral palsy (difficulties with movement control resulting from brain damage) results from genetic vulnerability, worsened by teratogens, maternal infection, and a birth in which anoxia (a temporary lack of oxygen) occurs.

IV. The New Family

Instructional Objective: To make students aware of teratogens that may affect prenatal development, as well as factors that may help prevent complications.

► AV: After the Baby Comes Home; Right from the Start
► Classroom Activities: “Dancing Baby Down” and Other Cultural Differences in How Newborns Are Welcomed; Maternal Bonding Reconsidered
► Teaching Tip: The Impact of Birth on the Family
► “On Your Own” Activities: What Are Your Attitudes Toward Birth? Saying When

1. Newborns are social beings that respond to others in many ways. The test that measures behavioral responsiveness in newborns is the Brazelton Neonatal Assessment Scale. The test measures 46 specific behaviors, 20 of which are reflexes.

2. The breathing reflex is an involuntary response that causes the newborn to take the first breath even before the umbilical cord is cut. Other reflexive behaviors that maintain oxygen are hiccups, sneezes, and thrashing.

3. Shivering, crying, and tucking the legs close to the body are examples of reflexes that help to maintain constant body temperature.
4. A third set of reflexes relates to feeding. One of these is the tendency of the newborn to suck anything that touches the lips. Another is the tendency of newborns to turn their heads and start to suck when something brushes against their cheek; this is the rooting reflex. Other important reflexes that facilitate this behavior are swallowing, crying, and spitting up.

5. At birth, the presence of the father reduces complications. This may explain the immigration paradox, which says that although immigrants to the U.S. are poorer and have less adequate prenatal care, they have healthier newborns than native-born mothers of the same ethnic background.

6. Many fathers experience couvade, or symptoms of pregnancy, including weight gain, indigestion, and pain during labor.

7. A crucial factor in the birth experience is the formation of a strong parental alliance between the prospective parents.

8. Some mothers may develop feelings of sadness and inadequacy, or postpartum depression, in the days and weeks after birth.

9. The term parent-infant bond is used to emphasize the strong, loving connection that forms between parent and child in the early moments after birth.

10. Extensive research has shown that the events right after birth are just one episode in a long-term process of bonding between parent and child.

11. For vulnerable infants, parents are encouraged to help with early caregiving in the hospital. This reduces stress in both infant and parents. One example of early caregiving is kangaroo care, in which mothers of low-birthweight infants spend extra time holding their infants between their breasts.