Module 2.3

Birth and the Newborn Infant

LEARNING OBJECTIVES

After reading Module 2.3, students will be able to answer the following questions:

Birth
LO9 What is the normal process of labor?

Birth Complications
LO10 What complications can occur at birth, and what are their causes, effects, and treatments?
LO11 How can infant mortality rates be lowered?

The Competent Newborn
LO12 What capabilities does the newborn have?

KEY TERMS AND CONCEPTS

Anoxia
Apgar scale
Bonding
Cesarean delivery
Classical conditioning
Episiotomy
Fetal monitor

Habituation
Low-birthweight infants
Neonates
Operant conditioning
Postmature infants
Preterm infants
Reflexes

Small-for-gestational-age infants
Stillbirth
States of arousal
Very-low-birthweight infants

MODULE OUTLINE

I. Birth
   A. Labor: The Process of Birth Begins
      1. The term used for newborns is NEONATES.
      2. About 266 days after conception, a protein called corticotropin-releasing hormone (CRH) triggers the process of birth.
      3. The hormone oxytocin is released from mother’s pituitary.
      4. Braxton-Hicks contractions have been occurring since the fourth month.
      5. Contractions force the head of the fetus against the cervix.
6. Labor proceeds in three stages:
   a) The first stage is the longest.
      (1) Uterine contractions occur every 8-10 minutes and last about 30 seconds.
      (2) Contractions increase to their greatest intensity, a period known as transition.
      (3) The mother’s cervix fully opens.
      (4) For first babies, this stage can last 16-24 hours (this varies widely).
      (5) Subsequent children involve shorter periods of labor.
   b) During the second stage of labor, the baby’s head moves through the birth canal.
      (1) This stage typically lasts 90 minutes.
      (2) After each contraction the baby's head emerges more and increases the vaginal opening.
      (3) An EPISIOTOMY is an incision sometimes made to increase the size of the opening of the vagina to allow the baby to pass.
      (4) This stage ends when the baby is born.
   c) The third stage of labor occurs when the child's umbilical cord and placenta are expelled.
      (1) This is the shortest stage.
      (2) It lasts only minutes.
   d) Cultural perspectives color the way that people in a given society view the experience of childbirth.

B. Birth: From Fetus to Neonate
   1. Birth occurs when the fetus passes through the vagina and emerges from the mother's body.
   2. As soon as they are born, most babies cry to clear their lungs and begin breathing on their own.
   3. The Apgar Scale
      a) The APGAR SCALE is a standard measurement system that looks for a variety of indications of good health in newborns.
      b) The scale was developed by Virginia Apgar in 1953.
      c) The Apgar directs attention to five qualities:
         (1) Appearance (color)
         (2) Pulse (heart rate)
         (3) Grimace (reflex irritability)
         (4) Activity (muscle tone)
         (5) Respiration (respiratory effort)
      d) Each quality is scored 0-2, producing an overall scale score that ranges from 0 to 10.
         (1) Most babies score around 7.
         (2) Scores under 4 need immediate life-saving intervention.
      e) A restriction of oxygen, ANOXIA, lasting a few minutes can cause brain damage.
   4. Physical Appearance and Initial Encounters
      a) Babies are often coated with vernix, a thick, greasy substance which smooths the passage through the birth canal.
      b) Newborns are often covered with a fine, dark fuzz called lanugo.
      c) Baby’s eyelids may be swollen and puffy from an accumulation of liquids during birth.
d) A matter of considerable controversy is the subject of **BONDING**, the close physical and emotional contact between parent and child during the period immediately following birth, and argued by some to affect later relationship strength.

C. Approaches to Childbirth: Where Medicine and Attitudes Meet

1. There are a variety of choices for how to give birth and no research proves that one method is more effective than another.

2. Alternative Birthing Procedures
   a) Lamaze birthing techniques (Dr. Fernand Lamaze)
      (1) The goal is to learn how to deal positively with pain and to relax at the onset of a contraction.
      (2) Women in low income groups tend to be less well prepared for labor and might suffer more pain during childbirth.
   b) Bradley Method
      (1) Known as “husband-coached childbirth.”
      (2) Principle: Childbirth should be as natural as possible.
      (3) Involves no medication or medical interventions.
   c) Hypnobirthing
      (1) Involves a self-hypnosis during delivery, which produces peace and calm, thereby reducing pain

3. Childbirth Attendants: Who Delivers?
   a) Obstetricians, a physician who specializes in childbirth
   b) Midwife, a nurse specializing in childbirth
   c) Doula, an experienced person who provides emotional, psychological, and educational support but does not replace an obstetrician or midwife

4. Use of Anesthesia and Pain-Reducing Drugs
   a) The use of medication during childbirth has benefits and disadvantages.
   b) It reduces pain.
      (1) One third of women who choose anesthesia choose to receive *epidural anesthesia*, which produces numbness from the waist down and can prevent them from helping to push the baby
      (2) A newer form is known as *walking epidural or dual spinal-epidural*, which use smaller needles and a system of delivering continuous doses of anesthetic, allowing women to move about more freely during labor.
      (3) Anesthetics might depress the flow of oxygen to the fetus, slow labor, and it might harm the fetus.
      (4) Not all studies suggest harmful effects for fetus.

5. Postdelivery Hospital Stay: Deliver, Then Depart?
   a) The average hospital stay following normal births has decreased from an average of 3.9 days in 1970 to 2 days in the 1990s.
   b) The American Academy of Pediatrics states that women should stay in the hospital no less than 48 hours after giving birth.
   c) The U.S. Congress has passed legislation mandating a minimum insurance coverage of 48 hours for childbirth.

6. Newborn Medical Screening
   a) Typically screens newborns for disorders via a small quantity of blood from infant’s heel.
   b) The number of disorders screened varies from state to state, and from a low of 3 screens to a high of over 30.
   c) Advantage of screening is early treatment of problems.
7. Becoming an Informed Consumer of Development: Dealing With Labor
   a) There is no right nor wrong way to deal with labor; strategies can help make the process as positive as possible.
      (1) Be flexible.
      (2) Communicate with your healthcare providers.
      (3) Remember that labor is . . . laborious.
      (4) Accept your partner’s support.
      (5) Be realistic and honest about your reactions to pain.
      (6) Focus on the big picture.

II. Birth Complications
   A. Preterm Infants: Too Soon, Too Small
   1. **PRETERM INFANTS** are born prior to 38 weeks after conception (also known as premature infants) are at high risk for illness and death.
      a) The main factor in determining the extent of danger is the child's weight at birth.
         (1) The average newborn weighs 3,400 grams (7 1/2 pounds).
         (2) **LOW-BIRTHWEIGHT INFANTS** weigh less than 2,500 grams (5 1/2 pounds).
         (3) Although only 7% of all newborns in the U.S. are low-birthweight, they account for the majority of newborn deaths.
         (4) **SMALL-FOR-GESTATIONAL-AGE INFANTS**, because of delayed fetal growth, are infants that weigh 90% or less than the average weight of infants of the same gestational age.
      b) Premature infants are susceptible to respiratory distress syndrome (RDS) because of poorly developed lungs.
      c) Low-birthweight infants are put in incubators, enclosures in which oxygen and temperature are controlled.
         (1) They are easily chilled, susceptible to infection, and sensitive to their environment.
      d) Preterm infants develop more slowly than infants born full term.
         (1) Sixty percent eventually develop normally.
         (2) Thirty eight percent have mild problems (such as learning disabilities or low IQ).
   2.
   3. Very-Low Birthweight Infants: The Smallest of the Small
      a) **VERY-LOW-BIRTHWEIGHT INFANTS** weigh less than 1,250 grams (2 1/4 pounds) and, regardless of weight, have been in the womb less than 30 weeks and are in grave danger because of the immaturity of their organ systems.
      b) Medical advances have pushed the AGE OF VIABILITY, or point at which an infant can survive a premature birth, to about 22 weeks.
      c) A baby born earlier than 25 weeks has less than a 50-50 chance of survival.
      d) Costs of keeping very-low-birthweight infants alive are enormous.
      e) Research shows that children who receive more responsive, stimulating, and organized care are apt to show more positive outcomes than children whose care was not as good.
   4. What Causes Preterm and Low-Birthweight Deliveries?
      a) Multiple births
      b) Young mothers (under age 15)
      c) Too closely spaced births
d) General health and nutrition of mother
e) African-American mothers have double the number of low-birthweight babies that Caucasian mothers do.

B. Postmature Babies: Too Late, Too Large
   1. POSTMATURE BABIES, those still unborn two weeks after the mother's due date, face several risks.
      a) Blood supply to baby's brain may be decreased and cause brain damage.
      b) Labor and delivery become more difficult.

C. Cesarean Delivery: Intervening in the Process of Birth
   1. Over a million mothers in the U.S. today have a CESAREAN DELIVERY where the baby is surgically removed from the uterus, rather than traveling through the birth canal.
      a) Several types of difficulties can lead to Cesarean delivery.
         (1) Fetal distress is most frequent.
         (2) Used for breech position, where the baby is positioned feet first in the birth canal.
         (3) Used for transverse position, in which the baby lies crosswise in the uterus.
         (4) When the baby's head is large.
         (5) Mothers over age 40 are more likely to have Cesarean deliveries than younger ones.
      b) Routine use of FETAL MONITORS, devices that measure the baby’s heartbeat during labor, have contributed to soaring rates of Cesarean deliveries, up 500% from 1970s. Frequency has several criticisms.
         (1) There is no association between Cesarean delivery and successful birth consequences.
         (2) It involves major surgery and a long recovery for the mother.
         (3) There is a risk of infection to the mother.
         (4) Easy birth may deter release of certain stress hormones, such as catecholamines, which help prepare the infant to deal with stress outside the womb.
         (5) Babies born via Cesarean delivery are more prone to breathing problems at birth.
         (6) Medical authorities currently recommend avoiding routine use of fetal monitors.

D. Mortality and Stillbirth: The Tragedy of Premature Death
   1. INFANT MORTALITY is defined as death within the first year of life.
      a) U.S. ranks 26nd with 7.3 deaths per 1,000 live births.
      b) Rate is declining since 1960s.
      c) STILLBIRTH is the delivery of a child who is not alive and occurs in less than 1 delivery in 100.
      d) Parents grieve in the same manner as if an older loved one dies.
      e) Depression is a common aftermath.
      f) African American babies are more than twice as likely to die before age one than white babies.

E. Cultural Dimensions: Overcoming Racial and Cultural Differences in Infant Mortality
   1. African American babies are twice as likely to die before the age of one as white babies.
   2. This may be the result of socioeconomic factors such as poverty which result in poor prenatal care.
   3. The overall infant mortality rate in the U.S. is higher than the rate in many countries.
a) The U.S. has a higher rate of low-birthweight and preterm deliveries.
b) The U.S. has more people living in poverty who are less likely to get adequate medical care.
c) Other countries do a better job providing prenatal care at low cost and even free.
d) The percentage of pregnant women in the U.S. who receive no prenatal care has increased since the 1990s.
e) Free or inexpensive health care and basic education could reduce these problems.

F. Postpartum Depression: Moving from the Heights of Joy to the Depths of Despair
1. Postpartum depression is a period of deep depression following childbirth.
2. This depression affects about 10% of all new mothers.
3. Symptoms such as an enduring sleep, deep feelings of sadness and unhappiness may last for months or even years.
4. Postpartum depression may be triggered by changes in hormone production after giving birth.
5. Maternal depression may lead to emotional detachment and lack of responsiveness to infants that may affect an infant’s social maturation and behavior.

III. The Competent Newborn
A. Physical Competence: Meeting the Demands of a New Environment
   1. Reflexes are unlearned, organized, and involuntary responses that occur automatically in the presence of certain stimuli.
      a) Sucking and swallowing reflexes permit the neonate to ingest food.
      b) The rooting reflex, which involves the turning in the direction of a source of stimulation near the mouth, guides the infant to the breast and nipple.
   2. The newborn’s digestive system produces meconium, a greenish-black material that is a remnant of the neonate’s days as a fetus.
   3. Because their livers do not work efficiently, almost half of all newborns develop neonatal jaundice, a yellowish tint to their bodies and eyes.
   4. Jaundice is most likely to occur in preterm and low-weight babies.
B. Sensory Capabilities: Experiencing the World
   1. Infants’ visual and auditory systems are not yet fully developed.
      a) They can see levels of contrast and brightness.
      b) They can tell size consistency and distinguish colors.
      c) They react to sudden sounds and recognize familiar sounds.
   2. They are sensitive to touch.
   3. Their senses of taste and smell are well developed.
C. Circumcision of Newborn Male Infants: The Unkindest Cut?
   1. Much debated procedure that has most U.S. prestigious medical associations claiming that it is not medically necessary.
   2. Emerging research, however, suggests that circumcision may provide protection against some sexually transmitted diseases such as HIV infection [studies conducted in Africa].
D. Early Learning Capabilities

1. **CLASSICAL CONDITIONING**, a type of learning in which an organism responds in a particular way to a neutral stimulus that normally does not bring about that type of response, underlies the learning of both pleasurable and undesired responses in the newborn.

2. **OPERANT CONDITIONING**, a form of learning in which a voluntary response is strengthened or weakened, depending on its association with positive or negative consequences, functions from the earliest days of life.

3. **HABITUATION**, the decrease in the response to a stimulus that occurs after repeated presentations of the same stimulus, is probably the most primitive form of learning and occurs in every sensory system of the infant.
   
   a) Habituation produces an *orienting response*, in which infants become quiet and attentive to new stimuli.

E. Social Competence: Responding to Others

1. Infants have the ability to imitate others.

2. Infants can differentiate between such basic facial expressions as happiness, sadness, and surprise.

3. Newborns cycle through various **STATES OF AROUSAL**, different degrees of sleep and wakefulness ranging from deep sleep to great agitation.

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**LECTURE SUGGESTIONS**

**Childbirth Options**

Methods of childbirth have changed dramatically in the last 50 years. Most current methods are based on the pioneering work of Grantly Dick-Read in England and Ferdinand Lamaze in France. In 1944 Dick-Read proposed that fear is the major cause of most of the pain of childbirth. He proposed the concept of *natural childbirth* and developed a method of teaching women about reproduction, pregnancy, delivery, and exercises in breathing, relaxation, and fitness. Lamaze, in the 1950s, developed a method called *prepared childbirth* where expectant mothers are taught to breathe and concentrate on sensations other than contractions. This is facilitated by a "coach," usually the father, who attends classes with her and helps time her breathing. Fathers then became a part of the childbirth process, and by the 1970s hospitals were beginning to allow them to go into the delivery room to assist. Now, most fathers elect to participate in the birth of their children.

Although 99% of all babies born in the United States are born in hospitals, some women elect to have their babies at home with the services of either a physician who specializes in home births or a midwife, a specially trained nurse. These options should only be used by women whose pregnancies are low risk. Hospitals responded to the home-birth movement by offering birthing centers, rooming-in facilities so mothers and babies are together all day, and sibling visitations.

*Source:*
Are There Too Many Cesarean Section Deliveries?

More Cesarean section deliveries (c-sections) are performed in the United States than in any other industrialized nation. C-section rates have risen 50% since 1979. Reasons for Cesarean delivery include: labor is progressing poorly, the mother has had a previous c-section (although many women can successfully deliver vaginally after a previous c-section), the baby is in the breech or transverse position, the mother has an active case of genital herpes, and to avert potential malpractice suits. Some critics argue that the use of a fetal monitor has increased the incidence of c-sections. Babies born by c-section miss out on the stress hormones released during birth (catecholamines). These hormones are believed to help in the post-birth breathing process. The effects on mothers are a result of the major abdominal surgery involved, which is associated with a longer hospital stay, longer recovery, higher rates of postpartum depression, and a greater risk of infection. As a result of criticisms, the rate has dropped since the 1980s.

Source:

Low-Birthweight Babies

The number one risk factor associated with death in infants in the first months of life is low birthweight. Low birthweight is defined as under five pounds for a full-term infant. Low-birthweight babies also spend more time in intensive-care nurseries at an annual cost of over $2 billion.

Several conditions contribute to the possibility of low birthweight:

- maternal hypertension
- rubella during the first 16 weeks of pregnancy
- urogenital infections
- diabetes
- more than four previous pregnancies
- teenage mother or mother over age 35
- mother underweight or malnourished
- cigarette or marijuana smoking
- having two or more abortions
- anemia
- exposure to teratogens
- maternal stress

Source:

CLASS ACTIVITIES

Critical Thinking Exercises

1. Get copies of Darcy Frey’s article in the New York Times Magazine titled "Does Anyone Here Think This Baby Can Live?" (see Supplemental Reading for the complete reference). Have your class read the article and write an essay considering the following Rethink questions.

   What are some ethical considerations relating to the provision of intensive medical care to very-low-birthweight babies?

   Do you think such interventions should be routine practice? Why or why not?

2. Have students investigate the cost of childbirth in their city. These costs should include prenatal care, the hospital/doctor or midwife charges, and costs of items for the baby, such as clothing, well-baby checkups, and furniture.

Reflective Journal #3: Birth

Use Handout 2-6 to guide the third Reflective Journal Entry.

Infant Reflexes

See Handout 2-7 for information about survival and primitive reflexes.

SUPPLEMENTAL READING


- This magazine is published for expectant mothers and fathers and uses some of Nilsson’s photographs to describe how the fetus develops month by month. To obtain a copy write to Cahners Publishing Company, 249 West 17th Street, New York, NY 10011 or call (212) 645-0067.


- This is an excellent and comprehensive guide that covers conception, pregnancy month by month, and childbirth.


- This annually updated series presents articles published in magazine, newspapers, and journals on current issues in development. Editions now include annotated World Wide Web sites. A good source for keeping up to date.

Dushkin/McGraw-Hill.

- *A State of the Art Pregnancy* and *Fetal Psychology* provide additional information on the importance of a health prenatal environment.


- This article presents a true story of a 24-week-old fetus who is born prematurely and discusses the decisions involved in whether to use medical technology to keep the baby alive.


- Lennart Nilsson is justly famous for his amazing photographs of babies *in utero*. Share these with your class. The film *The Miracle of Life* also uses some of his microphotography. As one student exclaimed, “He must be a very small photographer!”


- Scientists have recently discovered a hormone in the human placenta that tells the pregnant woman’s body to begin labor.


- This fascinating article relates a typical birth.

**MULTIMEDIA IDEAS**

Note: These assets are not necessarily owned or distributed by Pearson Education. They may be available in your department or library.

(See Handout 1-4 for a way to have your students think about and evaluate any videos you show in class.)

*After the Baby Comes Home* (Films for the Humanities and Sciences, 19 minutes)

- This film shows how new parents can prepare for the stress of the new baby, including postpartum depression, marital stress, exhaustion, and the reactions of siblings.

*The Amazing Newborn* (Polymorph Films, 1975, 26 minutes)

- This film emphasizes the sensory capabilities of the newborn.

*Birth and the Newborn* (Concept Media, 27 minutes)

- A video describing various childbirth practices.

*Birth at Home* (Filmmakers Library, 14 minutes)

- A fascinating film about a home birth in Australia assisted by a midwife.

*The Dad Film* (Fanlite Productions, 1991, 28 minutes)

- This video assuages the anxieties of "expectant dads" and encourages the involvement of fathers in the birth experience.
Developmental Phases Before and After Birth (Films for the Humanities and Sciences, 28 minutes)

Easier to Bear (ABC News/Prentice Hall, 1994, 12 minutes)
- A 20/20 segment that deals with underwater birth as an alternative method to ease the pain of childbirth. Both pros and cons are discussed. Several underwater births are shown.

Five Women, Five Births (Davidson Films, 29 minutes)
- This film shows two home births and three hospital births.

- Dispels common misconceptions and shows what midwives do.

A Joyous Labor (Filmmakers Library, 1987, 30 minutes)
- Explores birth options: hospital, home births, birthing centers and the methods used in each setting.

Labor and Delivery (Injoy Productions, 35 minutes)
- This video details the labor and delivery process and includes interviews with mothers and fathers during the last weeks of pregnancy and after delivery.

The Miracle of Birth (AIMS Media, 1989, 30 minutes)
- This video presents current information on childbirth.

The Miracle of Life (Time-Life Films, 1983, 57 minutes)
- Shows development from conception to birth using Nilsson’s microphotography techniques. Actually presents footage of the fetus moving in utero.

The Newborn (Films for the Humanities and Sciences, 23 minutes)
- This program shows the reactions of newborns 10 days after birth and important functions of infancy such as sitting, standing, walking, and social contact.

The Process of Birth (Films for the Humanities and Sciences, 23 minutes)
- This program shows how different cultures and different individuals determine the best birth position, whether births should take place in a hospital, who should be in attendance at the birth, and whether mother should breastfeed the newborn.

LECTURE LAUNCHER VIDEO

Video Title: Physical Development: The First Five Years
Segment Title: Neonatal Reflexes
Run Time: 0:49

Description: This brief clip presents two of the primitive reflexes: rooting and grasping. The primitive reflexes seem to help infants adapt to their new environment and protect them from harm.

Uses: Use this clip to begin a lecture on motor development and to show students the rooting and grasping reflexes. You may wish to start a discussion about how these reflexes benefit a newborn infant.
Question: When do the primitive reflexes disappear?
Answer: Many of the reflexes disappear by the fourth month of life. The increase in voluntary control that occurs over the first few months of life may explain why these reflexes gradually disappear.

Question: What is the rooting reflex?
Answer: The rooting reflex is the newborn’s tendency to turn its head when its cheek is touched. This reflex helps infants find food.

**STUDENT CD-ROM**

*Birth and the Newborn Infant*
Activity Names: Habituation; Synaptic Development

**HANDOUTS**

**Handout 2-6:** Reflective Journal Entry #3: Birth
Use this handout for the third Reflective Journal Entry.

**Handout 2-7:** Infant Reflexes
This handout lists both the survival and primitive reflexes of infants.
REFLECTIVE JOURNAL ENTRY #3

Birth

You may (a) consult with your parents about your own birth, (b) interview a new parent about her birth experience, or (c) consider the birth of your own child(ren). Please discuss the following in your journal:

1. Describe the events leading up to the delivery. Where did the delivery take place? Who was present? Was any medication used? Was the birth experience as you expected it to be?

2. What was your initial reaction to the newborn? How soon were you able to hold the baby? When did you name the child? If you stayed in a hospital, describe your experience after the birth.

3. What were the first weeks at home like? What problems did you experience? How was having a baby different than you expected? Describe a typical day at home during the first weeks after the baby was born.
## Handout 2-7

### INFANT REFLEXES

#### Survival Reflexes

<table>
<thead>
<tr>
<th>Reflex</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>Breathing</td>
<td>Infants reflexively inhale to obtain oxygen and expel carbon dioxide.</td>
</tr>
<tr>
<td>Rooting</td>
<td>If you touch an infant’s cheek, the infant will turn its head toward the stimulus and open its mouth as if expecting a nipple.</td>
</tr>
<tr>
<td>Sucking</td>
<td>If you touch or otherwise stimulate an infant’s mouth, the infant will respond by sucking and making rhythmic movements with the mouth and tongue.</td>
</tr>
<tr>
<td>Pupillary</td>
<td>The pupils of infant’s eyes narrow when in bright light and when going to sleep, and widen when in dim light and when waking up.</td>
</tr>
<tr>
<td>Eye-blink</td>
<td>Infants blink in response to an object’s moving quickly toward their eyes or to a puff of air.</td>
</tr>
</tbody>
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#### Primitive Reflexes

<table>
<thead>
<tr>
<th>Reflex</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>Moro (startle)</td>
<td>When infants are startled by loud sounds or by being suddenly dropped a few inches, they will first spread their arms and stretch out their fingers, then bring their arms back to their body and clench their fingers.</td>
</tr>
<tr>
<td>Palmar</td>
<td>When an infant’s palm is stimulated, the infant will grasp tightly and increase the strength of the grasp as the object is pulled away.</td>
</tr>
<tr>
<td>Plantar</td>
<td>When an object or a finger is placed on the sole of an infant’s foot near the toes, the infant responds by trying to flex the foot.</td>
</tr>
<tr>
<td>Babinski</td>
<td>If you stroke the sole of an infant’s foot from heel to toes, the infant will spread the small toes and raise the large one.</td>
</tr>
<tr>
<td>Stepping</td>
<td>When infants are held upright with their feet against a flat surface and are moved forward, they appear to walk in a coordinated way.</td>
</tr>
<tr>
<td>Swimming</td>
<td>Infants will attempt to swim in a coordinated way if placed in water in a prone position.</td>
</tr>
<tr>
<td>Tonic neck</td>
<td>When infants’ heads are turned to one side, they will extend the arm and leg on that side and flex the arm and leg on the opposite side, as if in a fencing position.</td>
</tr>
</tbody>
</table>

Adapted from Craig (1999). *Human Development*. Upper