LESSON ASSIGNMENT

LESSON 10 The Premature Infant.

TEXT ASSIGNMENT Paragraphs 10-1 through 10-8.

LESSON OBJECTIVES After completing this lesson, you should be able to:

10-1. Identify terms, definitions, and criteria that relates to the premature infant.

10-2. Select the eleven causes for prematurity.

10-3. Select those nursing measures and reasons for the premature infant needing assistance with his respiratory status.

10-4. Select those nursing measures and reasons for caring for the premature infant having difficulty maintaining his body temperature.

10-5. Identify those measures used when caring for an infant needing help with maintaining adequate nutrition.

10-6. Identify those measures used to prevent infections in the premature infant.

10-7. Identify those illnesses to which a premature infant is most susceptible.

10-8. Select those factors that may place a premature infant at risk for failure to thrive (FTT).

SUGGESTION After studying the assignment, complete the exercises at the end of this lesson. These exercises will help you to achieve the lesson objectives.
LESSON 10
THE PREMATURE INFANT

10-1. GENERAL

The premature infant's mortality risk is far greater than that of the term infant. It accounts for over fifty percent of deaths among neonates. A large percentage of all premature infants can survive if they receive comprehensive medical management, including specialized nursing care. The adjustment to extrauterine life presents an added hazard to the premie because he leaves the protection of the uterus before his physical development is sufficient. He comes into the extrauterine world with physiological limitations that could set the stage for both early and later complications. These limitations or handicaps differ in kind, number, and severity, depending on gestational age at birth. The smaller the infant, the more arduous his struggle is expected to be. Each premature infant provides the nursery personnel with a unique challenge. His specific physical needs are met most successfully when the nurse recognized the intensity of care required and applies expert nursing skills geared to assist with his struggle.

10-2. DEFINITION AND CRITERIA

The premature (preterm) infant is one born before the end of the thirty-seventh week of gestation. Additional criteria used to more objectively define prematurity are neurological development data, skin and joint characteristics, size, and any predominant pathophysiologic conditions.

10-3. CAUSES OF PREMATURITY

In most instances the causes of prematurity are not known. However, the following conditions are considered:

a. Poor diet.

b. Poor health.

c. Cervical incompetence.

d. Multiple pregnancies/births.

e. Advanced age of parents.

f. Trauma.
g. Toxemia.

h. Congenital malformations of the fetus.

i. Chronic infection or disease of the mother (i.e., syphilis, tuberculosis, cardiac disease, and diabetes).

j. Acute infection of the mother (that is, pneumonia and rheumatic fever).

10-4. INITIATION AND MAINTENANCE OF RESPIRATION IN THE PREMATURE INFANT

Initiation and maintenance of respiration in the premature infant is of primary concern. The lung maturity varies in accordance with the degree of prematurity, drugs given before hand, and/or prolonged stress before delivery. The alveoli began to form at twenty six to twenty eight weeks gestation. The longer the delivery of the baby can be delayed, the greater will be the ability of the lungs to sustain extrauterine life.

a. At the moment of delivery, the newborn must switch from passive reception of oxygen to establishing and maintaining ventilation by untried lungs. Not infrequently, the premature infant is incapable of this task, making resuscitation necessary. The respiratory muscles are poorly developed, the chest wall lacks stability, and production of surfactant is reduced. Effective resuscitation must be established to prevent the development of irreversible respiratory acidosis.

b. The infant should be positioned to allow for easy drainage of mucus from his mouth. Very small infants are placed on their side, whereas, large infants are placed on their abdomen. The infant's head may be tilted down except when danger of increased intracranial pressure or increased respiratory distress, which is due to his liver pressing on the diaphragm.

c. The best way to evaluate the baby's oxygen status is through arterial blood gases. Caution must be applied during the administration of 100% oxygen during resuscitation or to maintain respirations because it places the immature infant in danger of developing pulmonary edema or retrolental fibroplasia.

d. The infant needs continuous monitoring/assessment for:

   (1) Respiratory rate, depth, and regularity.

   (2) Periods of apnea greater than 20 seconds.

   (3) Respiratory rate after apneic episode (same, increased, or decreased).

   (4) See-saw respirations.
(5) Expiratory grunting.

(6) Chin tug.

(7) Retractions.

(8) Nasal flaring.

(9) Cry (feeble, whining, and high-pitched).

(10) Heart rate (usually increased).

(11) Cyanosis (when it occurs, where, relieved by O₂, and amount of O₂ needed).

(12) Reflexes (gag and swallow).

(13) Prebirth history.

10-5. MAINTENANCE OF BODY TEMPERATURE IN THE PREMATURE INFANT

The lack of subcutaneous fat and poor muscular development make the premature infant more susceptible to loss of body heat. The absent or minimal flexion of extremities prevents the premature infant from self-positioning to decrease the amount of body surface requiring heat. In the absent or poor reflex control of skin capillaries, there is no shivering to produce heat. Immediately after delivery the baby should be placed under a radiant heat warmer. He must never be without provisions of external warmth at any time. It is good practice to keep the baby's head covered because of the large amount of heat that is lost through the head. The body temperature of the infant should be maintained at 98°F axillary.

10-6. MAINTENANCE OF ADEQUATE NUTRITION IN THE PREMATURE INFANT

a. The growth rate of the premature infant should parallel the expected intrauterine growth rate. Most immature neonates have feeble, absent or unsynchronized sucking and swallowing reflexes. A great deal of patience is needed when feeding them. A specially made nipple for premature infants may need to be used.

b. Maintenance of fluid balance also poses a problem. A high proportion of fluid is excreted from the baby through the urine because the baby is unable to efficiently concentrate urine. Intravenous fluid is usually initiated within the immediate hours following birth. Intravenous glucose is provided to prevent development of hypoglycemia.
c. The premature infant has a small gastric capacity but a high caloric requirement. Adequate nutritional support may be achieved by providing frequent feedings of small amounts using a high calorie formula.

d. The premature infant regurgitates feedings easily because of the poor muscle tone at the cardiac sphincter. They can only eat small amounts at each feeding. Their heads should be elevated after eating.

e. In addition to high calorie content, the formula is often supplemented with calcium, phosphorous, electrolytes (that is, sodium, potassium, and chloride), and vitamins.

f. When breast milk is required, the mother can pump her breast and the milk can be fed to the baby at a later time.

g. Inappropriate weight gain of the premature infant in relation to caloric intake can indicate problems. Usually large weight gain may indicate excessive fluid retention. No weight gain or a loss may indicate acidosis, sepsis, or malabsorption.

h. The premature infant should be allowed to rest between feedings. The infant tires easily from procedures and will eat better if rested. Each feedings should not last longer than 15 minutes.

i. Gavage feeding (see figure 10-1) may be required until the preterm infant is strong enough for the gradual introduction of bottle or breast-feeding. Before each feeding, stomach secretions are usually aspirated, measured, and the amount/characteristics are documented. If the infant has more than 2 ml of secretions in the stomach prior to feeding, he is probably receiving more formula than can be digested between feedings.

Figure 10-1. Gavage feeding.
j. When the immature newborn is given intravenous feedings, the fluid should be controlled by a continuous infusion pump to ensure a constant rate and to prevent over feeding. The infant must be carefully observed for the development of hyperglycemia because of the increased amounts of glucose administered. Urine checks are made and the frequency, glucose, detones, and specific gravity are recorded.

10-7. PREVENTION OF INFECTION IN THE PREMATURE INFANT

The infant is very vulnerable to infection because the skin is immature and easily traumatized, thus weakening the defense against pathogens. The baby also has a lower resistance to infection because of a white blood cell count that is lower than the term infant. Protective measures include:

a. A restriction on all staff who have an infection.

b. Meticulous handwashing.

c. Gowning regulations.

d. Separate premature nursery.

e. Contact with only essential authorized personnel

f. Cleanliness of immediate environment.

10-8. ILLNESS OF THE PREMATURE INFANT

a. The premature infant is especially susceptible to some major illnesses.

(1) Respiratory distress syndrome/Hyaline membrane disease.

(2) Bronchopulmonary dysplasia - emphysematous changes which occur as a result of \( O_2 \) toxicity.

(3) Pulmonary dysmaturity.

(4) Retrolental fibroplasia.

(5) Hypoglycemia.

(6) Sepsis.

(7) Anemia.
b. There may be risk for failure to thrive as the baby grows older because of early:

(1) Feeding problems.

(2) Infection.

(3) Hemorrhage.

(4) Jaundice.

(5) Delayed mother/infant bonding.
INSTRUCTIONS: Answer the following exercises by marking the lettered response that best answers the exercise, by completing the incomplete statement, or by writing the answer in the space(s) provided.

After you have completed all of these exercises, turn to "Solutions to Exercises" at the end of the lesson and check your answers. For each exercise answered incorrectly, reread the material referenced with the solution.

1. An infant is considered premature if he is born before the_______________ week of gestation.

2. To allow for easy drainage of mucus from a premature infant, very small infants are placed on their ________________ and large infants are placed on their ________________.

3. No weight gained or a loss of weight for a premature infant may indicate: __________________, ________________, and ____________________

4. What conditions are considered causes of prematurity?

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5. What is the best way to evaluate an infant's oxygen status?

________________________________________________________________________

6. What protective methods are provided for the prevention of infection in the premature infant.

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7. What major illness is susceptible to the premature infant?

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8. List seven of the thirteen factors that require continuous monitoring/assessment for the premature infant.

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9. The premature infant regurgitates feeding easily because of the infant's:
   a. Small mouth.
   b. Thick tongue.
   c. Small gastric capacity.
   d. Poor muscle tone at the cardiac sphincter.

10. Failure of the premature infant to thrive as he grows older can be related to early:
   a. Infections.
   b. Feedings.
   c. Surgery.
   d. Method of birth.

Check Your Answers on Next Page
SOLUTIONS, LESSON 10

1. 37th week. (para 10-2)

2. Side.
   Abdomen. (para 10-4b)

3. Acidosis.
   Sepsis.
   Malabsorption. (para 10-6g)

4. Poor diet.
   Poor health.
   Cervical incompetence.
   Multiple pregnancies/births.
   Advanced age of parents.
   Trauma.
   Toxemia.
   Congenital malformations of the fetus.
   Chronic infection or disease of the mother.
   Acute infection of the mother. (para 10-3)

5. Through arterial blood gases. (para 10-4c)

6. Restriction on all staff who have an infection.
   Meticulous handwashing.
   Gowning regulations.
   Separate premature nursery.
   Contact with only essential authorized personnel.
   Cleanliness of immediate environment. (para 10-7a-f)

7. Respiratory distress syndrome.
   Bronchopulmonary dysplasia.
   Pulmonary dysmaturity.
   Retrolental fibroplasia.
   Hypoglycemia.
   Sepsis.
   Anemia. (para 10-8a)
8. Any seven of the thirteen.

   Respiratory rate, depth, and regularity.
   Periods of apnea greater than 20 seconds.
   Respiratory rate after apneic episode.
   See-saw respirations.
   Expiratory grunting.
   Chin tug.
   Retractions.
   Nasal flaring.
   Cry.
   Heart rate.
   Cyanosis. (para 10-4d)

9. d (para 10-6d)

10. a (para-8b(2))