Newborn

NORMAL NEWBORN

Biological Adaptations in the Neonatal Period

Data Collection
A. Respiratory system.
1. Respirations are usually established within 1 minute after birth, often within the first few seconds.
2. Lusty cry usually accompanies good respiratory effort.
3. Newborn respiration should be quiet; no dyspnea or cyanosis.
4. Cyanosis may be apparent in the hands and feet (acrocyanosis); circumoral cyanosis (around the mouth) may persist for an hour or two after birth but should subside.
5. Average respiratory rate: 30 to 60 breaths/min.
6. Respiratory movements: Diaphragmatic and abdominal muscles are used; very little thoracic movement.
7. Neonate breathes through the nose (obligate nose-breather); consequently, nasal obstruction with mucus will lead to respiratory distress.
B. Circulatory system.
1. Closure of the ductus arteriosus, the foramen ovale, and the ductus venosus.
2. Circulatory changes are not always immediate and complete; usually complete in a few days; often this period is called transitional circulation.
3. Pulse rate: 100-160 beats/min.
4. Normal BP is systolic 60-80 mm Hg and diastolic 40-50 mm Hg measured using Doppler ultrasonography—need correctly sized cuff.
C. Body temperature and heat production.
1. Body temperature may drop to 94°F (34.4°C) or even as low as 92°F (33.3°C) after birth unless the infant is adequately protected.
2. Heat is generated immediately by shivering; infant shivering is characterized by increased muscular activity, restlessness, and crying.
3. Metabolism of brown fat (brown adipose tissue) functions to produce heat under the stress of cooling.
4. Effect of chilling on the neonate.
   a. Increased heat production leads to increased oxygen consumption, which leads to increased metabolism of glucose and brown fat.
   b. When heat production is high, caloric need is high.
   c. Tendency to develop metabolic acidosis occurs.
   d. Production of surfactant is inhibited by cooling, and respiratory distress syndrome may occur.
   e. Increased risk with smaller neonates.
D. Length.
1. Average body length of term neonate: 45 to 55 cm (18 to 22 inches).
2. Infant is measured by being placed flat on the back on paper and determining the distance from head to heel; a pencil is used to mark the locations of head and heels, and the distance between locations is measured when the infant is removed.
E. Weight.
1. Average birth weight for a term neonate: 3400 gm (7 lb 8 oz).
2. Weight loss: between 5% and 10% of birth weight within the first few days of life; infant usually regains weight within 10 to 14 days.
F. Head.
1. Molding.
   a. Head may appear elongated at birth; molding usually disappears within 24 to 48 hours.
   b. Occurs as a result of abnormal fetal posture in utero and pressure during passage through the birth canal.
2. Caput succedaneum (Figure 21-1).
   a. Edema of the scalp caused by the pressure occurring at the time of delivery.
   b. Disappears within 3 to 4 days.
   c. Edema goes across the cranial suture lines.
3. Cephalhematoma.
   a. A collection of blood between the periosteum and the skull.
   b. Usually results from trauma during labor and delivery.

✔ NURSING PRIORITY: Excessive heat loss occurs from radiation and convection because of the newborn’s larger surface area as compared with body weight. It is important to remember that conduction loss occurs as a result of the marked difference between core body temperature and skin temperature.
c. Absorbed in a few weeks; does not cross cranial suture lines.

4. Head measurement.
   a. Average head circumference of the term newborn: 34.2 cm; usual variation ranges from 33 to 35 cm (13 to 14 inches).
   b. Head circumference is approximately 2 to 3 cm greater than the chest circumference; extremes in size may indicate microcephaly, hydrocephaly, or increased intracranial pressure.

   TEST ALERT: Compare physical development of newborn with identified norms

5. Fontanels (anterior and posterior).
   a. Palpate for size and tension.
   b. Increase in tension may indicate tumor, hemorrhage, infection, or congenital anomaly.
   c. Decrease in tension (sunken fontanel) may indicate dehydration.
   d. Anterior will close in about 12 to 18 months; posterior will close in 2 to 3 months.

G. Umbilical cord.
   1. Determine number of blood vessels; there should be two arteries and one vein surrounded by Wharton’s jelly.
   2. Cord atrophies and sloughs off by day 10 to 14.

H. Nervous system.
   1. Nervous system is relatively immature and characterized by the following:
      a. Poor nervous control; easily startled.
      b. Quivering chin.
      c. Tremors of the lower extremities of short duration.
      d. Sleep and awake states.

(1) Newborn sleeps an average of 16 to 20 hours a day during the first 2 weeks of life, with an average of 4 hours at a time.
(2) May vary from a drowsy or semi-dozing state to an alert state to a crying state.

2. Presence of positive Babinski sign.
   a. Normal finding until the age of 1 year.
   b. Dorsiflexion of big toe and fanning of the other toes.

3. Neonatal reflexes (Table 21-1).

   NURSING PRIORITY: Intactness of the neonate’s nervous system is indicated by the state of alertness, resting posture, cry, and quality of muscle tone and motor activity.

I. Hematological system.
   1. Physiological jaundice; increased incidence in breast-fed infants; occurs on the second or third day of life as a result of an increase in the serum bilirubin level.
   2. Pathological jaundice occurs within 24 hours of birth (see hemolytic disease of the newborn).
   3. Transitory coagulation defects.
      a. Result from the lack of intestinal synthesis of vitamin K because of insufficient bacterial flora in the GI tract.
      b. Vitamin K (0.5 to 1.0 mg) is administered intramuscularly in the vastus lateralis to prevent complications.

J. GI tract.
   1. Stools.

   NURSING PRIORITY: Monitor the passage of the first meconium stool.

   a. Meconium: sticky, black, odorless, sterile stool that is passed within the first 24 to 48 hours after birth; if no stool is passed, further assessment is needed.
   b. Stools change according to type and amount of feedings.

   (1) Transitional stools: occurs during period between second and fourth day; consist of meconium and milk; greenish brown or greenish yellow; loose and often contain mucus.
   (2) Milk stools: usually occur by the fourth day; stools of formula-fed infant are drier, more formed, paler, and occur once or twice daily or 1 stool every 2-3 days
   (3) Stools of breast-fed infants are golden yellow, have a pasty consistency, and occur more frequently than stools of formula-fed infants, 3-4 stools in 24 hours.
TABLE 21-1   MAJOR NEONATAL REFLEXES

<table>
<thead>
<tr>
<th>Reflex</th>
<th>Disappears</th>
<th>How to Elicit</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rooting</td>
<td>3 to 4 mo; may persist during sleep until 7 to 8 mo</td>
<td>Stroke cheek.</td>
<td>Head turns toward side that is touched.</td>
</tr>
<tr>
<td>Babinski</td>
<td>1 yr</td>
<td>Lightly stroke lateral side of foot from heel to toe across the foot.</td>
<td>Infant’s toes fan, with dorsiflexion of great toe.</td>
</tr>
<tr>
<td>Sucking</td>
<td>10 to 12 mo</td>
<td>Touch or stroke lips.</td>
<td>Infant sucks.</td>
</tr>
<tr>
<td>Moro (startle)</td>
<td>3 to 4 mo</td>
<td>Make a loud noise or suddenly disturb infant’s equilibrium.</td>
<td>Infant stiffens, briskly abducts, and extends arms with hands open and fingers extended to C shape. Infant’s legs flex and abduct, and arms return to an embracing posture. Crying is usual.</td>
</tr>
<tr>
<td>Grasp Palmar</td>
<td>3 to 4 mo</td>
<td>Press a finger against infant’s palm.</td>
<td>Infant’s fingers momentarily close around object.</td>
</tr>
<tr>
<td>Asymmetric tonic neck (fencer’s position)</td>
<td>3 to 4 mo</td>
<td>Turn supine infant’s head over the shoulder to one side.</td>
<td>Infant’s arm and leg partially or completely extend on side to which head is turned; opposite arm and leg flex.</td>
</tr>
</tbody>
</table>

K. Genitourinary system.
1. Thirty to 60 mL is voided per day during the first 2 days of life; followed by 200 mL per day by the end of the first week.
2. Frequency of voiding: average of two to six times per day, increasing up to 10 to 15 times per day.

![NURSING PRIORITY: Most newborns void within the first 24 to 48 hours after birth. Weigh dry diaper before applying, then weigh wet diaper after infant voiding. Each gram of added weight equals 1mL of urine.]

L. Integumentary system.
1. Vernix caseosa: a white cheesy-like material covers the skin at birth, particularly noted in the folds and creases.
2. Petechiae: pinpoint bluish discolorations primarily on the skin and face as a result of pressure from delivery; bruising of tissues may be seen.
3. Lanugo: downy, fine covering of hair that may be present on the shoulders, back, earlobes, and forehead; disappears during the first week.
4. Milia: pinpoint white bumps seen over the bridge of the nose and on the cheeks during the first 2 weeks of life.
5. Erythema toxicum: splotchy pink papular rash appearing anywhere on the body; disappears within the first few days of life; no treatment is necessary.
6. Mongolian spots: bluish darkened pigmented areas seen on the back or buttocks of dark-skinned infants (African American and Asian American infants and those of Mediterranean descent); usually disappears by school age.

M. Sensory system.
1. Eyes appear large, and pupils appear small.
2. Tears do not develop until 2 to 4 weeks of age.
3. Sudden loud noises may elicit startle response.
4. Differentiates between pleasant and unpleasant tastes.
5. Most sensitive area is around the mouth.
6. Searches for food when cheek is touched or begins sucking movement when lips are touched.

O. Musculoskeletal system.
1. Assumes the position of comfort, which is usually the position assumed in utero.
2. Normal palmar crease is present (simian crease is indicative of Down syndrome).
3. Spine is straight and flat when in prone position.

Nursing Intervention

![TEST ALERT: Provide physical care for a newborn.]

Goal: To establish and maintain a patent airway and promote oxygenation.
A. Position infant with head slightly lower than chest; may use postural drainage or side-lying position.
B. Suction nostrils and oropharynx with bulb syringe.
C. Observe for apnea, cyanosis, and mucus collection and if noted report to RN.

✔ **NURSING PRIORITY:** During first 4 hours after birth, the priority nursing goals are to maintain a clear airway, maintain a neutral thermal environment, and prevent hemorrhage and infection. Bathing will be initiated when infant’s temperature is stabilized; feeding may begin immediately if infant is interested.

- **Goal:** To protect against heat loss.
  A. Immediately after birth, wrap infant in warm blanket and dry off amniotic fluid.
  B. Replace wet blanket with warm dry blanket.
  C. Cover wet hair and head with a blanket or cap.
  D. Give infant to mother to cuddle; place infant on a warm padded surface, preferably under a radiant heater or in an incubator; or provide for skin-to-skin contact with the mother.

- **Goal:** To collect data and assess physical condition and behavior.
  A. Determine Apgar score at 1 minute and again at 5 minutes (see Table 20-7 for Apgar scoring).

✔ **NURSING PRIORITY:** The APGAR score at 1 minute evaluates the neonate’s intraterine oxygenation; at 5 minutes it evaluates the status of the neonate’s cardiorespiratory adaptation after birth.

- **Goal:** To provide daily general care.
  A. Care of the umbilical cord stump.
     1. Hospital protocol directs routine cord care, which may include using a drying solution of alcohol and triple dye that is applied to the cord.
     2. Clean the umbilical cord stump several times a day with soap and water, especially after infant voids (for a male infant).
     3. To encourage drying of the cord, expose umbilical area to air frequently and position diaper below umbilicus.
     4. Observe for bleeding, oozing, or foul odor.
  B. Circumcision care.
     1. Keep area clean; change diaper frequently.

- **Goal:** To properly identify infant.
  A. Secure identification bands to wrist or ankle of infant and wrist of mother in the delivery room.
  B. Prints of infant’s foot, palms, or fingers may be obtained according to hospital policy; mother’s palm prints or fingerprints may also be obtained.
  C. Advise parents not to release the infant to anyone who does not have proper unit identification.

- **Goal:** To prevent bleeding problems (hypofibrinogenemia).
  A. Administer 0.5 to 1.0 mg of vitamin K, intramuscularly into the upper third of the lateral aspect of the thigh (vastus lateralis).

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- **Goal:** To initiate feeding and to evaluate parents’ ability to feed infant and provide nutrition.
  A. Encourage breast feeding, if desired, immediately after delivery or in recovery area; breast milk is bacteriologically safe.
  B. First formula feeding or test feeding: administer 10 to 15 mL of sterile water to assist GI tract patency followed by formula.
  C. Considerations in infant feeding.
     1. An infant should always be placed on the right side after feeding to avoid aspiration and prevent regurgitation and distention.
     2. Infant will require more frequent feedings initially; will generally establish a routine of feeding every 3 to 4 hours.

- **Goal:** To prevent infection.
  A. Follow guidelines for proper hand hygiene before and between handling infants.
  B. Prevent opthalmia neonatorum.
     1. Administer prophylactic treatment to eyes soon after birth.
     2. Place opthalmic ointment in the lower conjunctival sac.
  C. Avoid exposure to people with possible upper respiratory tract, skin, or GI infections.
  D. Hepatitis B vaccination recommended at birth and routine HIV screening.

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- **Goal:** To protect against infection.
  A. Follow guidelines for proper hand hygiene before and between handling infants.
CHAPTER 21  Newborn  447

2. Observe for bleeding – check site hourly for 12 hours postprocedure.
3. A small sterile petrolatum gauze dressing may be applied to the area during the first 2 to 3 days (Gomco and Mogen clamp).
4. If a PlastiBell was used, keep area clean; application of petrolatum jelly is not necessary; plastic ring will dislodge when area has healed (5-7 days).

√ NURSING PRIORITY: Teach the parents that a whitish-yellow exudate around the glans is granulation tissue and is normal and not indicative of infection. It may be observed for 2 to 3 days and should not be removed.

C. Neonate’s bath.
   1. Bath is delayed until vital signs and temperature stabilize.
   2. Warm water is used for the first 4 days; do not immerse infant in water until umbilical cord stump has been released.
   3. When bathing neonate, apply principles of clean-to-dirty areas; wash areas in the following order: eyes, face, ears, head, body, genitals, buttocks.
   4. Head is an area of significant heat loss; keep it covered.
D. Determine weight loss over first 24 hours after birth – monitor wet diapers.

E. Assess stools.
   1. Meconium stools.
   2. Transitional stools.

Goal: To detect complications and provide early treatment.
A. Newborn screening test after first 24 hours for a formula-fed infant or neonate; if mother is breast-feeding, explain importance of returning when infant is 1 week old to obtain blood sample; newborns are screened for the following disorders: galactosemia, hypothyroidism, and sickle cell anemia.
B. Administration of first hepatitis B vaccine before discharge; also, hepatitis B immune globulin is given intramuscularly, if mother is a hepatitis B carrier.
   1. Encourage follow-up visits for second and third doses of hepatitis B vaccine and other immunizations.

Goal: To promote infant feeding.
B. Breast-feeding.
   1. First feeding should occur immediately or within a few hours after birth.
   2. Frequent feedings are important initially to establish milk production, often every 1½ to 2 hours.

HIGH-RISK NEWBORN

Gestational Age Variation

Data Collection
A. Respiratory parameters.
   1. Observe respiratory rate, rhythm, and depth.
      a. Initially, rate increases without a change in rhythm.
      b. Flaring of nares and expiratory grunting are early signs of respiratory distress.
   2. Increase in apical pulse rate.
3. Subcostal and xiphoid retractions progress to intercostal, substernal, and clavicular retractions.
   a. Progresses from pink to circumoral pallor to circumoral cyanosis to generalized cyanosis.
   b. Increased intensity of acrocyanosis.
5. Progressive respiratory distress.
   a. Chin tug (chin pulled down and in with mouth opening wider—auxiliary muscles of respiration are used).
   b. Abdominal seesaw breathing patterns.
   c. Distinguish between apneic episodes (15 seconds or longer) and irregular breathing (cessation of breathing for 5 to 10 seconds).
6. Falling body temperature.
7. Progressive anoxia leading to cardiac decompensation and failure.
8. Increased muscle flaccidity: frog-like position.

B. Nutrition.
1. Assess readiness and ability to feed: swallowing, gag reflexes.
2. Screen for hypoglycemia.
3. Observe for congenital dysfunction and anomalies related to tracheoesophageal fistula, anal atresia, and metabolic disorders.
4. Check amount and frequency of elimination.
5. Assess for vomiting or regurgitation; a preterm infant’s stomach capacity is small, and overfeeding can occur.
6. Check mucous membranes, urine output, and skin turgor to identify fluid and electrolyte imbalances.
   a. Skin turgor over abdomen and inner thighs.
   b. Sunken fontanel.
   c. Urinary output of less than 30 mL/day.
C. Temperature regulation.
1. Assess infant’s temperature: frequently done with a skin probe for continuous monitoring of temperature in infants at high risk for complications.
2. Check coolness or warmth of body and extremities.
3. Detect early signs of cold stress.
   a. Increased physical activity and crying.
   b. Increased respiratory rate.
   c. Increased acrocyanosis or generalized cyanosis along with mottling of the skin (cutis marmorata).
   d. Male with descended testes: presence of cremasteric reflex (testes are pulled back up into the inguinal canal on exposure to cold).
4. Monitor infant’s temperature.
   a. Axillary temperature: 36.5° C (97.7° F).
   b. Place a temperature skin probe on infant while he or she is in the radiant warmer or isolette.

Nursing Intervention for the High-Risk Newborn

Disorders Acquired During and After Birth (Table 21-2)

Goal: To maintain respiratory functioning.
A. Provide gentle physical stimulation to remind infant to breathe.
   1. Gently rub the infant’s back.
   2. Lightly tap the infant’s feet.
B. Ensure patency of respiratory tract.
   1. Maintain open airway by means of nasal, oral, or pharyngeal suctioning.
   2. Position to promote oxygenation.
      a. Elevate head 10 degrees with neck slightly extended by placement of a small folded towel under the shoulders.
      b. Flex and abduct infant’s arms and place at sides.
      c. Avoid diapers or adhere them loosely.
      d. Turn side to side every 1 to 2 hours.
      e. Do not place in prone position.
C. Assist infant’s respiratory efforts.
   1. Monitor oxygen pressure. Avoid high concentrations of oxygen for prolonged periods: leads to complications of bronchopulmonary dysplasia.
   2. Continuous positive airway pressure (CPAP) counters the tendency of the alveoli to collapse by providing continuous distending airway pressure and is administered either by endotracheal tube or nasal prongs.

Goal: To provide adequate nutrition.
A. Detect hypoglycemia and treat immediately: Administer 5% dextrose in water intravenously if infant is unable to tolerate oral feeding.
B. Oral feeding: initial feeding.
   1. Use sterile water: 1 to 2 mL for a small infant.
   2. Use preemie nipple to conserve infant’s energy.
   3. Because of small size of infant’s stomach, feedings are small in amount and increased in frequency.
C. Orogastric tube feedings.
   1. Usually administered by continuous flow of formula with an infusion pump (kangaroo pump) when the infant is:
      a. Having severe respiratory distress.
      b. Too immature and weak to suck.
      c. Tired and fatigues easily when a preemie nipple is used.
   2. Placement and insertion of orogastric feeding tube.
      a. Position infant on the back or toward the right side with the head and chest slightly elevated.
      b. Measure correct length of insertion by marking on the catheter the distance from the tip of the nose to the ear lobe to the tip of the sternum.
      c. Lubricate tube with sterile water and slowly...
1. Weak or absent sucking and swallowing reflexes.
2. Necessity of high caloric content with a very small stomach capacity.
3. Poor gag reflex, leading to aspiration.
4. Increased incidence of vomiting and development of abdominal distention.
5. Inability to absorb essential nutrients.
6. Excessive loss of water through evaporation from the skin and respiratory tract.

Goal: To maintain warmth and temperature control (see maintaining temperature of normal newborn).
A. Oxygen and air should be warmed and humidified.
B. Maintain abdominal skin temperature at 36.1° to 36.7° C (97° to 98° F); axillary temperature 36.5° C (97.8° F).
C. Monitor infant’s temperature continuously; make sure that temperature probe is set on control panel, probe is in contact with infant’s skin, and all safety precautions are maintained.
D. Prevent rapid warming or cooling; warming process is increased gradually over a period of 2 to 4 hours.
E. Infant may need extra clothing or need to be wrapped in an extra blanket for additional warmth.

D. Hyperalimentation (total parenteral nutrition) may be ordered to provide complete nutrition through an indwelling catheter threaded into the vena cava.
E. Detect complications that arise with feeding the preterm infant as a result of:

<table>
<thead>
<tr>
<th>Trauma</th>
<th>Peripheral Nerve Injuries</th>
<th>Neonatal Sepsis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment</td>
<td>Soft tissue injury. Caput succedaneum. Cephalhematoma. Injury to bone: Fractured clavicle is the most common; often occurs with a large-sized infant.</td>
<td>Temporary paralysis of the facial nerve is the most common. Affected side of the face is smooth. Eye may stay open. Mouth droops at the corner. Forehead cannot be wrinkled. Possible difficulty sucking. Brachial palsy: a partial or complete paralysis of the nerve fibers of the brachial plexus. Cannot elevate or abduct the arm. Abnormal arm position or diminished arm movements.</td>
</tr>
<tr>
<td>Nursing Interventions</td>
<td>1. Place affected arm against chest wall with hand lying across chest. 2. Position is held by a figure-8 stockinette around the arm and chest. 3. Pick infant up carefully; shoulder should not be pressed toward middle of body. 4. Affected side should not be placed in gown or undershirt.</td>
<td>Facial nerve palsy: 1. Apply eye patch; may use artificial tears to prevent corneal irritation. 2. Provide support during feeding; infant may not latch on to nipple well. Brachial nerve palsy 1. Keep arm abducted and externally rotated with elbow flexed. 2. Arm is raised to shoulder height, and elbow is flexed 90 degrees.</td>
</tr>
</tbody>
</table>

CBC, Complete blood count; TORCH, toxoplasmosis, other (congenital syphilis and viruses) rubella, cytomegalovirus, and herpes virus.
Respiratory Distress

* Hyaline membrane disease (HMD), also referred to as respiratory distress syndrome (RDS), occurs as a result of the deficiency of surfactant that lines the alveoli.
* Meconium aspiration syndrome occurs when the fetus passes meconium in utero and aspirates the meconium into the lungs, which leads to obstruction in the small airway passages.

Data Collection

A. Tachypnea: more than 60 breaths/min.
B. Apneic spells (in excess of 15 seconds).
C. Abnormal breath sounds: rales and rhonchi.
D. Chest retraction.
E. Chin tug: noticed on inspiration; mouth open, lips apart.
F. Flaring of the nares.
G. Expiratory grunting.
H. Meconium aspiration - meconium stained amniotic fluid.

**NURSING PRIORITY:** Grunting is an ominous sign and indicates impending need for respiratory assistance; most often, mucus needs to be cleared from airway.

Complications

A. Hypoxia, acidosis caused by alveolar hypoventilation.
B. Bronchopulmonary dysplasia: chronic stiff, noncompliant lungs.

Treatment

A. Respiratory distress syndrome.
   1. CPAP is the primary treatment.
   2. Administration of surfactant through the airway into the infant’s lungs.
B. Meconium aspiration.
   1. Administration of oxygen with humidification.
   2. Postural drainage and percussion; antibiotic therapy.
   3. Acid-base imbalance correction, if needed.

Nursing Intervention

**Goal:** To promote oxygenation and respiratory functioning.

A. Administer a steroid (betamethasone) to mother at least 48 hours before delivery and administer surfactant to neonate after delivery to stimulate surfactant production.
B. Refer to nursing intervention for the high-risk newborn.

Cleft Lip and Cleft Palate

* Cleft lip is a fissure or split in the upper lip, which may vary from a slight notch to a complete separation extending into the nostril; may be unilateral or bilateral.
* Cleft palate is a fissure or a split in the roof of the mouth (palate).

Data Collection

A. Visible at birth on an incompletely formed lip.
B. Sucking difficulties and breathing problems with cleft palate.
C. Increased incidence of upper respiratory tract infection and otitis media.
D. Later problems related to speech and hearing difficulties with cleft palate.

Treatment

A. Surgical: closure of lip defect usually precedes treatment for a cleft palate (which is done in stages).
B. Long-term care management: speech therapy, orthodontics; frequent occurrences of otitis media.

Nursing Intervention

**Goal:** To provide preoperative care.

A. Maintain nutrition.
   1. Use a large-holed nipple or a modified nipple to increase infant’s ability to obtain milk without sucking.
   2. Feed slowly.
   3. Bubble and burp frequently (after every 15 to 30 mL).
   4. Rinse cleft with water after each feeding to help prevent infection.
   5. Do not place infant on pillow, elevate head of bed, or put the pillow under the mattress.
B. Prepare parents for newborn’s surgery.
   1. Encourage parents to position infant flat on back or on side to accustom infant to the postoperative positioning.
   2. Encourage parents to place infant in arm restraints periodically before hospital admission, so they become familiar with restriction of arm motion after surgery.
   3. Encourage parents to feed infant with the same method that will be used after surgery.

**Goal:** To provide postoperative care.

A. Prevent trauma to suture line.
   1. Position infant on back or side and elevate head (infant seat).
   2. Restrain arms with soft elbow restraints.
   3. Cleanse suture line gently after each feeding; use cotton-tipped applicator with prescribed solution and roll along the suture line; may apply antibiotic ointment.
4. Prevent any crust or scab formation on lip and suture line.
5. May use protective lip device.
B. Maintain a patent airway and facilitate breathing.
   1. Assess for respiratory distress.
   2. Observe for swelling of the nose, tongue, and lips.
C. Provide adequate nutrition.
   1. Feed in an upright, sitting position.
   2. Feed slowly and burp/bubble at frequent intervals.
D. Provide discharge teaching to parents.
   1. Encourage parents to cuddle and play with infant to decrease crying and prevent trauma to suture line.
   2. Teach feeding, cleansing, and restraining procedures.

**Esophageal Atresia with Tracheoesophageal Fistula**

* Proximal end of esophagus ends in a blind pouch and the lower segment connects to the trachea.

**Data Collection**

A. Characterized by the classic 3 Cs: choking, coughing, and cyanosis.
B. Excessive frothy saliva and constant drooling.
C. Aspiration is a complication, especially during feeding.

**Nursing Intervention**

- **Goal:** To provide preoperative care.
  A. Maintain patent airway.
     1. Supine position with head elevated on an inclined plane of at least 30 degrees.
     2. Suction nasopharynx.
     3. Observe for symptoms of respiratory distress.
  B. Prepare parents for infant’s surgery.

- **Goal:** To provide postoperative care.
  A. Maintain respirations and prevent respiratory complications.
     1. Administer oxygen.
     2. Oral suction of secretions and position for optimum ventilation.
     4. Administer antibiotics.
     5. Place in warm, high-humidity isotope.
  B. Provide adequate nutrition.
     1. Gastrostomy feedings may be started on the second or third postoperative day.

- Oral feedings may be delayed until 2 weeks after surgery.
- Meet oral sucking needs by offering infant a pacifier.

**Imperforate Anus**

* An imperforate anus is an absence of the anal opening.

**Data Collection**

A. Absence of meconium.
B. No anal opening.
C. Gradual increase in abdominal distention.

**Nursing Intervention**

- **Goal:** To identify anal malformation.
  A. Detect increasing abdominal distention.
  B. Inspect anal area for opening.

- **Goal:** To provide postoperative care.
  A. Prevent infection by maintaining good perineal care and keeping operative site clean and dry, especially after passage of stool and urine.
  B. Do not take temperatures rectally.
  C. Place infant in side-lying prone position.
  D. May have a colostomy.

**Neural Tube Defects**

* A neural tube defect (spina bifida) results in midline defects and closure of the spinal cord (may be noncystic or cystic); most common site is lumbosacral area.

**Data Collection**

A. Types.
   1. Spina bifida occulta – bony defect (bone of spine does not cover spinal cord).
   2. Spina bifida cystica.
      a. Meningocele: a sac-like cyst of meninges filled with spinal fluid that protrudes through a defect in the bony part of the spine.
      b. Myelomeningocele: a sac-like cyst containing meninges, spinal fluid, and a portion of the spinal cord with its nerves that protrudes through a defect in the vertebral column; other defect most frequently associated with this is hydrocephalus.
Treatment

A. Surgical: closure of defect with 24 to 48 hours to decrease risk of infection, relieve pressure, repair sac, and possibly insert a shunt.

Nursing Intervention

✔ NURSING PRIORITY: Correct positioning of the infant is critical in preventing damage to the sac, as well as in providing nursing care after surgery.

- Goal: To provide preoperative care.
  A. Prevent and protect sac from drying, rupturing, and infection.
     1. Position infant prone on abdomen.
     2. Avoid touching sac.
     3. Provide meticulous skin care after voiding and bowel movements.
     4. Often, sterile, normal saline soaks on a nonadherent dressing may be used to prevent drying.
  B. Detect early development of hydrocephalus.
     1. Measure head and check circumference frequently.
     2. Check fontanels for bulging and separation of suture line.
  C. Monitor elimination function.
     1. Note whether urine is dripping or is retained.
     2. Indwelling catheter may be inserted, intermittent catheterization may be done, or créde method may be used at regular intervals.
     3. Assess for bowel function: Glycerin suppository may be ordered to stimulate meconium passage.

- Goal: To provide postoperative care.
  A. Prevent trauma and infection at the surgical site.
     1. Place infant in same position (prone on abdomen) as before surgery.
     2. Continue to provide scrupulous skin care as described under preoperative goals.
  B. Assess neurological status frequently for indications of increasing intracranial pressure, development of hydrocephalus, or early signs of infection.
     1. Continue to measure head circumference daily.
     2. Perform frequent neurological checks.
  C. Provide parents with education in regard to positioning, feeding, skin care, elimination procedures, and range of motion exercises.
     1. Encourage and facilitate parental bonding.
     2. Refer to community and social agencies for financial and social support.
     3. Encourage long-range planning and support of parents for long-term rehabilitation of infant.

Data Collection

A. Apathy, lethargy, poor temperature control.
B. Poor feeding, abdominal distention, diarrhea.
C. Cyanosis, irregular respirations, apnea.
D. Infant often described as “not acting right”; may be irritable

Nursing Intervention

- Goal: To prevent neonatal sepsis by prenatal prevention; maternal screening for sexually transmitted diseases and assessment of rubella titers.
A. TORCH (toxoplasmosis, other [congenital syphilis and viruses], rubella, cytomegalovirus, and herpes simplex virus) syndrome is discussed as it relates to the infant and adult in Chapter 17.

Isoimmune Hemolytic Disease of the Newborn

- An antigen-antibody response causing destruction of fetal RBCs as a result of maternal sensitization of fetal RBC antigens and subsequent transfer of the resulting antibodies to the fetus.

Data Collection

A. Clinical manifestations: ABO incompatibility.
   1. Jaundice occurs in a cephalocaudal direction: It begins at the face, advances downward on the body to trunk and extremities, and finally to the palms and the soles of the feet.

✔ NURSING PRIORITY: Press skin against a bony prominence (e.g., chin, nose) to detect early color change.

2. Anemia.
B. Diagnostics.
   1. Prenatal screening and prevention: Rh incompatibility.
      a. Administration of Rh(D) immune globulin to prevent Rh sensitization in first pregnancy of Rh-negative mother (see prenatal care).
      b. Indirect Coombs’ test: performed on the mother’s serum.
      c. Postdelivery detection (Rh incompatibility): direct Coombs’ test on cord blood
      d. Rh(D) immune globulin is administered within 72 hours of an Rh-negative mother’s delivery of an Rh-positive infant.

Nursing Intervention

- Goal: To recognize jaundice and distinguish the physiological type (which occurs within 48 to 72 hours) from the pathological type (which occurs within 24 hours).
A. Prenatal monitoring of maternal-fetal status.
B. Identify high-risk mother.
C. Monitor bilirubin levels in the newborn.

Infant of a Diabetic Mother

Data Collection

A. Clinical manifestations
1. Puffy, cushingoid appearance, with round cheeks and stocky neck.
2. Enlarged heart, liver, and spleen.
4. Increased Moro reflex and irritability on slight stimulation or lethargy at times.

B. Common complications.
1. Hypoglycemia: blood glucose level of below 36 mg/dl within 1½ to 4 hours after birth.
   - Lethargy, irritability, hypocalcemia.
   - High-pitched cry.
   - Twitching, jitteriness, seizures.
   - Apneic spells and abdominal distention.
2. Respiratory distress syndrome.
3. Polycythemia.
4. Birth trauma caused by excessive size.
5. Congenital defects, specifically cardiac (patent ductus arteriosus is most common) and central nervous system defects (anencephaly, myelomeningocele, and hydrocephalus).

NURSING PRIORITY: Prolonged hypoglycemia can cause irreversible brain damage.

Nursing Intervention

Goal: To monitor glucose levels.

A. Frequently check blood glucose levels.
B. Minimize trauma to heel site by performing heel stick correctly.
   1. Warm heel for 5 to 10 minutes before sticking.
   2. Cleanse site with alcohol and dry before sticking.
   3. The lateral heel is the site of choice.

Study Questions: Newborn

1. What equipment should the nurse have available immediately after birth to assist the infant with the initial respiratory effort?
   1. Stethoscope and suction catheter.
   2. Heated crib and a stocking cap.
   3. Bulb syringe and oxygen.
   4. Oxygen and stethoscope.

2. The nurse is assessing a newborn for the presence of a caput succedaneum. What findings would confirm the presence of this condition?
   1. Swelling confined to the parietal areas of the skull.
   2. Diffuse edema under the scalp.
   3. A collection of blood under the scalp.
   4. Petechial hemorrhages in the conjunctivae.

3. What signs would a nurse observe in a newborn with respiratory distress?
   1. Flaring of the nares, grunting, and chest wall retractions.
   2. Lusty crying, heaving chest wall, and flailing arms.
   3. Respiratory rate of 50 breaths per minute, pulse rate of 166 beats per minute, and sneezing.
   4. Uncontrolled crying, acrocyanosis, and respiratory rate of 60 breaths per minute.

4. The nurse is assessing the newborn. What nursing assessment data would cause the most concern?
   1. Has loud crying with periods of light sleep.
   2. Has a blood glucose level of 75 mg/dl.
   3. Turns dusky and cyanotic when crying.
   4. Acrocyanosis is present 4 hours after birth.

5. The newborn is given vitamin K soon after birth. What is the purpose of this medication?
   1. Is used as a prophylactic measure because the newborn does not have an immediate supply.
   2. Assists with building iron stores in the blood of the newborn.
   3. Helps to stabilize the electrolytes in the newborn’s system.
   4. Prevents jaundice by breaking down the newborn’s bilirubin.

6. To meet the goal of promoting infant feeding in a breastfed baby, the nurse should teach the mother to:
   Select all that apply:
   1. Feed the baby on a 3- to 4-hour schedule.
   2. Alternate breast and formula for each feeding.
   3. Stop breast-feeding if her nipples get sore.
   4. Maintain demand breast-feeding for the first 4 weeks.
   5. Drink lots of fluids and get adequate rest.
   6. Offer a pacifier between feedings to meet sucking needs.

7. What is a characteristic finding when performing a nursing assessment on a newborn with hypoglycemia?
   1. Acrocyanosis.
   2. Respirations of 50 breaths per minute.
   3. Increased irritability.
   4. Decreased pulse rate.

8. What nursing measures are important to decrease the loss of body heat in a newborn?
   1. Keep the infant bundled with a stocking cap on the head.
   2. Regulate the room temperature between 68˚ F and 70˚ F.
3 Keep the infant in a warmer for the first 8 hours after birth.
4 Assess the core temperature and respirations every 3 hours.

9. What is a nursing measure to reduce the possibility of infection in the newborn?
   1 Keep the cribs at least 3 feet apart in the nursery.
   2 Wash hands before and after care delivered to each newborn.
   3 Wash hands before diaper changes.
   4 Decrease visiting times to only 1 hour and for groups of three people.

10. The nurse is observing a new mother breastfeed her infant. To decrease the amount of air the infant swallows, what would the nurse suggest to the mother?
    1 Place the newborn on the back with the head turned to the left.
    2 Offer the infant the pacifier after each feeding.
    3 Burp or bubble the infant after the first few minutes of feeding.
    4 Limit the infant to only 10 minutes of nursing at one feeding.

11. In which situation would the nurse anticipate Rh(D) immune globulin human (RhGAM) to be given?
    1 When the mother is Rh positive.
    2 Within 48 hours after delivery.
    3 After a postpartal hemorrhage.
    4 When the mother is Rh negative.

12. What laboratory test is important to obtain on the newborn in order to detect complications?
    1 Alpha-fetoprotein.
    2 Urinalysis.
    3 Phenylketonuria (PKU).
    4 Serum iron.

13. Which behavior exhibited by the mother with her newborn would the nurse identify as maladaptive regarding parent-infant attachment?
    1 Cuddles newborn close to her breast.
    2 Looks at the face of the newborn, while talking.
    3 Explains to the nurse how the newborn is feeding.
    4 Seldom looks at newborn when family is visiting.

14. The clinic nurse observes that a 3-day-old baby girl is jaundiced. A bilirubin level is drawn, and it is 11.4 mg/dl. What causes this bilirubin level?
    1 Physiologic jaundice.
    2 Hemolytic disease.
    3 Erythroblastosis fetalis.
    4 Sepsis.

15. The nurse assigned to the nursery understands the importance of keeping the newborn swaddled in a warm blanket in order to prevent heat loss because:
    1 Chilling leads to increased heat production and greater oxygen needs.
    2 The newborn’s metabolic rate is decreased.
    3 Evaporation will affect the newborn’s ability to feed.

4 The newborn will sleep more comfortably.

16. The newborn’s mother is concerned about the shape of the baby’s head after delivery. She states that it looks like a “cone head.” The most appropriate response by the nurse is the following:
   1 “You don’t need to worry about it. It is perfectly normal after birth.”
   2 “It is molding caused by the pressure during birth and will disappear in a few days.”
   3 “I will report it to the health care provider and he will order a diagnostic scan.”
   4 “It is a collection of blood related to the trauma of delivery and will absorb in a few weeks.”

17. The nurse is responsible for documenting the first meconium stool the newborn passes. If the newborn does not have a stool in the first 24 hours of life, the nurse should first:
   1 Insert a rectal thermometer to facilitate the process.
   2 Inspect the anal area for an opening.
   3 Monitor the vital signs for an increase in temperature.
   4 Increase oral feeding to stimulate passage of stool.

18. The best way for the nurse to maintain the safety of the newborn in the hospital is to:
    1 Have the mother come to the nursery to pick up the baby for feedings.
    2 Take the baby to the mother’s room for rooming-in.
    3 Ask the mother her name and social security number.
    4 Compare the name band information of the mother and baby.

19. A newborn has a Plastibell circumcision. In reinforcing the teaching with the parents, which instructions would you give the parents for care of the circumcised penis? Select all that apply:
    ______ 1 Remove any exudates that form during the first 24 hours.
    ______ 2 Wash penis gently during diaper change to remove urine and feces.
    ______ 3 Apply sterile petroleum gauze to the penis for first 24 hours.
    ______ 4 Clean the glans with alcohol to promote healing.
    ______ 5 Avoid positioning the infant on the abdomen during the healing process.
    ______ 6 Report any edema; purulent, malodorous discharge; increased temperature.

20. The nurse understands that meconium is:
    1 Well formed and dark in color.
    2 Often passed in the first 4 hours of life.
    3 Light in color and loose.
    4 Passed within the first 2 days of life.

Answers and rationales to these questions are in the section at the end of the book titled Chapter Study Questions: Answers and Rationales.