Learning Objective: Review and apply knowledge within “Assessment and Management of Newborn Complications” in readiness for performance of the following nursing activities as outlined by the NCLEX-PN® test plan:

- Check the newborn for possible complications.
- Provide care to the newborn who is experiencing complications.

Newborn Complication: Preterm Infant

Key Points

- A preterm infant is one who is born after 20 weeks gestation and before the completion of 37 weeks gestation.
- Preterm newborns are at risk for a variety of complications due to immature organ systems. The degree of complications depends on gestational age. The closer the newborn is to 40 weeks gestation, the less the chances are for complications.

- **Respiratory distress syndrome (RDS)** – decreased surfactant in the alveoli regardless of birth weight.
- **Bronchopulmonary dysplasia (BPD)** – causes the lungs to become stiff and noncompliant, requiring an infant to be placed on mechanical ventilation and oxygen. It is sometimes difficult to remove the infant from ventilation and oxygen after initial placement.
- **Aspiration** – a result of the premature infant not having an intact gag reflex or the ability to effectively suck or swallow.
- **Apnea of prematurity** – a result of immature neurological and chemical mechanisms.
- **Intraventricular hemorrhage** – bleeding in or around the ventricles of the brain.
- **Retinopathy of prematurity** – disease caused by abnormal growth of retinal blood vessels and is a complication associated with oxygen administration to the neonate. It can cause mild to severe eye and vision problems.

- **Patent ductus arteriosus (PDA)** – occurs when the ductus arteriosus reopens after birth due to neonatal hypoxia.

- **Necrotizing enterocolitis (NEC)** – an inflammatory disease of the gastrointestinal mucosa due to ischemia. NEC results in necrosis and perforation of the bowel. Short gut syndrome may be the result secondary to removal of most or part of the small intestine due to necrosis.

- **Additional complications** include infection, hyperbilirubinemia, anemia, hypoglycemia, and delayed growth and development.

### Key Factors

**Preterm births** can be attributed to many **causes** including:

- Gestational hypertension.
- Multiple pregnancies.
- Adolescent pregnancy.
- Lack of prenatal care.
- Substance abuse.
- Smoking.
- Previous history of preterm delivery.
- Abnormalities of the uterus.
- Cervical incompetence.
- Premature rupture of the membranes (PROM).
- Placenta previa.

### Diagnostic and Therapeutic Procedures and Nursing Interventions

**Tests** are performed to **monitor** for or **treat** the many **complications** of preterm birth.

- Complete blood count (CBC) shows decreased hemoglobin and hematocrit as a result of the slow production of red blood cells
- Urinalysis and specific gravity
- Increased prothrombin time and partial thromboplastin time with an increased tendency to bleed
- Chest x-ray
- Arterial blood gas (ABG)
- Head ultrasounds
- Echocardiography
- Eye exams
- Serum glucose
- Calcium
- Bilirubin

Data Collection

Monitor for **signs and symptoms** of a **preterm infant**.

- **Ballard assessment** shows a physical and neurological assessment totaling less than 37 weeks gestation
- **Periodic breathing** consists of 5 to 10 sec respiratory pauses, followed by 10 to 15 sec compensatory rapid respirations
- Signs of increased respiratory effort and/or respiratory distress
- Apnea (pause in respirations longer than 10 to 15 sec)
- Low birth weight
- **Minimal subcutaneous fat deposits**
- Head large in comparison to body
- Wrinkled features
- **Skin** that is thin, smooth, shiny, and may be translucent
- Veins clearly visible under thin, transparent epidermis
- **Lanugo** over the body
- **Soft, pliable ear cartilage**
- **Minimal creases** in the **soles** and **palms**
- Skull and rib cage feel soft
- Closed eyes if 22 to 24 weeks gestation
- **Few scrotal rugae**
- **Undescended testes**
- **Prominent labia** and **clitoris**
- **Flat areola without breast buds**
- Weak grasp reflex
- **Heels fully movable to the ears, posture extended and frog-like**
- **Inability to coordinate suck and swallow**, and a weak or absent gag, suck, and cough reflex; weak swallow
- **Hypotonic muscles**, decreased level of activity, weak cry for more than 24 hr
- Lethargy, tachycardia, and poor weight gain
- Signs of infection

\[\Delta\] Observe for **signs of dehydration or overhydration** (resulting from IV nutrition and fluid administration).

- **Dehydration**
  - Urine output less than 1 mL/kg/hr
  - Urine specific gravity more than 1.015
  - Weight loss
  - Dry mucous membranes
  - Poor skin turgor
  - Depressed fontanel

- **Overhydration**
  - Urine output greater than 3 mL/kg/hr
  - Urine specific gravity less than 1.001
  - Edema
  - Increased weight gain
  - Rales
  - Intake greater than output

\[\Delta\] **Assessments** for **premature infants** include:

- Performing rapid initial assessment.
- Monitoring the infant’s vital signs and temperature.
- Observing for complications of prematurity.
- Assessing the infant’s ability to consume and digest nutrients. Before a premature infant can feed by breast or nipple, the infant must have an intact gag reflex and be able to suck and swallow to prevent aspiration.
- Monitoring the infant’s intake and output.
- Monitoring elimination patterns consisting of frequency, amount, color, and consistency.
• Monitoring the infant for weight and fluid loss as well as measuring and recording the infant’s weight daily.
• Monitoring for bleeding from puncture sites and the gastrointestinal tract.

NANDA Nursing Diagnoses

Δ Ineffective airway clearance related to neuromuscular dysfunction
Δ Excess fluid volume related to intravenous nutrition
Δ Sudden infant death syndrome related to prematurity of infant
Δ Ineffective thermoregulation related to insufficient subcutaneous body fat
Δ Risk for infection related to immature immune system
Δ Risk for disorganized infant behavior related to prematurity of infant

Nursing Interventions

Δ Goals include meeting the infant’s growth and development needs and anticipating and managing associated complications such as respiratory distress syndrome and sepsis.

Δ The main priority in treating preterm newborns is supporting the cardiac and respiratory systems as needed. Most preterm infants are cared for in a neonatal intensive care unit (NICU). Meticulous care and observation in the NICU is necessary until the newborn can receive oral feedings, maintain body temperature, and weighs approximately 2 kg (4.4 lb).

• Perform resuscitative measures if needed.
• Ensure thermoregulation (neutral thermal environment) to maintain the premature infant’s body temperature.
• Administer respiratory support measures such as surfactant and/or oxygen administration.
• Administer parental or enteral nutrition and fluids as prescribed (most premature infants less than 34 weeks will receive fluids either by IV or gavage feedings).
• Administer medications as prescribed.
• Minimize stimulation. Cluster nursing care. Touch the newborn very smoothly and lightly. Keep lighting dim and noise levels reduced.
• Position the infant in neutral flexion with the extremities close to the body to conserve body heat. Prone and side-lying positions are preferred to supine with body containment using blanket rolls, swaddling, and secure holding to provide secure boundaries. Prone position encourages flexion of the extremities.
- Provide for **non-nutritive sucking** such as using a pacifier while gavage feeding.
- Protect against infection.
- Keep parents informed and educated about the care of their preterm newborn.

### Newborn Complication: Respiratory Distress Syndrome (RDS)

#### Key Points

- **Respiratory distress syndrome (RDS)** occurs as a result of **surfactant deficiency** in the lungs and is characterized by **poor gas exchange** and **ventilatory failure**.

- **Surfactant** is a phospholipid that **assists** in **alveoli expansion**. Surfactant keeps alveoli from collapsing and allows gas exchange to occur.

- **Atelectasis** (collapsing of a portion of lung) **increases** the **work of breathing**. As a result, respiratory acidosis and hypoxemia can develop.

- **Birth weight alone is not an indicator of fetal lung maturity.**

- **Complications** from RDS are **related to oxygen therapy** and **mechanical ventilation**.
  - Pneumothorax
  - Pneumomediastinum
  - Retinopathy of prematurity
  - Bronchopulmonary dysplasia
  - Infection
  - Intraventricular hemorrhage

#### Key Factors

- **Risk factors** that contribute to RDS include:
  - **Decreased gestational age** (preterm).
  - Perinatal asphyxia (e.g., meconium staining, cord prolapse, and nuchal cord).
  - Maternal diabetes.
  - Premature rupture of membranes.
  - Maternal use of barbiturates or narcotics close to birth.
• Maternal hypotension.
• Cesarean birth without labor.
• Hydrops fetalis (massive edema of the fetus caused by hyperbilirubinemia).
• Maternal bleeding during the third trimester.

Diagnostic and Therapeutic Procedures and Nursing Interventions

△ Newborns diagnosed with **RDS** require specific tests to evaluate their lung maturity, ability to exchange gases, and complications.

△ **ABGs** reveal **hypercapnia** (excess of carbon dioxide in the blood) and **respiratory or mixed acidosis**.

△ Chest x-ray

△ Culture and sensitivity of the blood, urine, and cerebrospinal fluid

△ Blood glucose and serum calcium

Data Collection

△ Monitor for **signs** and **symptoms** of **RDS**.

• Increased respiratory rate greater than 60/min (tachypnea)
• Intercostal and substernal retractions
• Labored breathing
• Fine rales on auscultation
• Nasal flaring
• Expiratory grunting
• Cyanosis
• As RDS worsens, the infant may become unresponsive, flaccid, and apneic, with decreased breath sounds.

△ **Assessment** for **RDS** includes:

• Monitoring pulse oximetry.
• Monitoring nutrition.
• Monitoring vital signs closely.
• Monitoring IV.
**NANDA Nursing Diagnoses**

- Impaired gas exchange related to deficient surfactant or underdeveloped alveoli
- Risk for impaired parent-infant attachment related to RDS of infant requiring medical interventions
- Impaired spontaneous ventilation related to decreased surfactant levels in the infant’s alveoli
- Dysfunctional ventilatory weaning response related to inability of the infant to breathe and/or complications associated with treatment of the disease
- Ineffective cardiovascular tissue perfusion related to RDS

**Nursing Interventions**

- **Factors that can accelerate lung maturation in the fetus while in utero** include increased gestational age, intrauterine stress, exogenous steroid use, and ruptured membranes.

- **Nursing interventions** for RDS in the infant are mostly supportive.
  - **Suction** the infant’s mouth, trachea, and nose as needed.
  - Maintain **thermoregulation**.
  - Administer **medications** as prescribed (e.g., exogenous surfactant in prematurity, naloxone [Narcan] in maternal narcotic use).
  - Provide **mouth** and **skin care**.
  - **Correct respiratory acidosis** by ventilatory support.
  - **Correct metabolic acidosis** by administering sodium bicarbonate.
  - Maintain **adequate oxygenation**, prevent lactic acidosis, and avoid toxic effects of oxygen.
  - **Decrease stimuli**.
  - Offer emotional support to the parents.

---

**Newborn Complication: Postterm Infant**

- A **postterm infant** is one who is born after the completion of 42 weeks of gestation. Postmaturity of the infant can be associated with either of the following:
• Dysmaturity from placental degeneration and uteroplacental insufficiency (placenta functions effectively for only 40 weeks) resulting in chronic fetal hypoxia and fetal distress in utero. The fetal response is polycythemia, meconium aspiration, and neonatal respiratory problems. Perinatal mortality is higher due to increased oxygen demands during labor not being met by the insufficient placenta.

• Continued growth of the fetus in utero because the placenta continues to function effectively and the infant becomes large for gestational age at birth. This leads to a difficult delivery, cephalopelvic disproportion, as well as high insulin reserves and insufficient glucose reserves at birth. The neonatal response can be birth trauma, perinatal asphyxia, a clavicle fracture, seizures, hypoglycemia, and temperature instability (cold stress).

A postmature infant may be either small for gestational age (SGA) or large for gestational age (LGA) depending on how well the placenta functions during the last weeks of the pregnancy.

Postmature infants have an increased risk for aspirating the meconium passed by the fetus in utero.

Persistent pulmonary hypertension (persistent fetal circulation) is a complication that can result from meconium aspiration. There is an interference in the transition from fetal to neonatal circulation, and the ductus arteriosus (connecting main pulmonary artery and the aorta) and foramen ovale (shunt between the right and left atria) remain open and fetal pathways of blood flow continue.

Key Factors

In most cases, the cause of an infant going postterm is unknown, but there is a higher incidence in first pregnancies and in women who have had a previous postterm pregnancy.

Diagnostic and Therapeutic Procedures and Nursing Interventions

Cesarean delivery

Chest x-ray to rule out meconium aspiration syndrome

Blood glucose levels to monitor for hypoglycemia

Arterial blood gases secondary to chronic hypoxia in utero due to placental insufficiency

Complete blood count may show polycythemia from decreased oxygenation in utero

Hematocrit elevated from polycythemia and dehydration
Data Collection

Monitor **signs** and **symptoms** of **postterm infant**.

- Wasted appearance, **thin** with **loose skin**, having used some of the subcutaneous fat
- **Peeling, cracked, and dry skin**; leathery from decrease in protective vernix and amniotic fluid
- Long, thin body
- **Meconium** staining of fingernails
- **Hair** and **nails** may be **long**
- May demonstrate **more alertness** similar to a 2-week-old infant
- May have difficulty establishing respirations secondary to meconium aspiration
- Signs and symptoms of **hypoglycemia** due to insufficient stores of glycogen
- Signs and symptoms of **cold stress**
- Neurological symptoms that become apparent with the development of fine motor skills
- **Macrosomia**

**Nursing assessment** of the **postterm infant** includes:

- Observing for birth injury or trauma.
- Respiratory status.
- Reflexes.
- Monitoring vital signs and temperature.
- Monitoring intravenous fluids.

**NANDA Nursing Diagnoses**

- Ineffective airway clearance related to meconium aspiration
- Risk for aspiration related to the presence of meconium
- Ineffective thermoregulation related to decreased subcutaneous fat

**Nursing Interventions**

- **Nursing interventions** for the **postterm infant** include:
  - Assisting with **surfactant lavages** during delivery to prevent meconium aspiration.
- **Suctioning meconium** from the neonate’s mouth and nares before the first breath.
- Using mechanical **ventilation** if necessary.
- Administering **oxygen** as prescribed.
- Administering **intravenous fluids**.
- Preparing and/or assisting with **exchange transfusion** if hematocrit is high.
- Providing **thermoregulation** in an **incubator** to avoid cold stress.
- Providing early feedings to **avoid hypoglycemia**.
- Identifying and **treating** any **birth injuries**.

### Newborn Complication: Large for Gestational Age Infant (LGA)/Macrosomic

**Key Points**

- **Large for gestational age (LGA)** is a neonate whose weight is **above the 90th percentile** or **weighing more than 4,000 g (8 lb, 12 oz)**. LGA neonates may be preterm, postterm, or full term. LGA does not necessarily mean postmature.
- **Macrosomic infants** are at risk for **birth injuries** (e.g., clavicle fracture or a cesarean birth, hypoglycemia, polycythemia).
- Uncontrolled **hyperglycemia** during pregnancy (leading risk factor for LGA) can lead to **congenital defects** with the most common being congenital heart defects, tracheoesophageal fistula, and central nervous system anomalies.

**Key Factors**

**Contributing factors** of an **LGA** infant include:

- **Postterm infants**.
- **Maternal diabetes** during pregnancy. High glucose levels stimulate continued insulin production by the fetus.
- Fetal disorder of transposition of the great vessels.
- Genetic factors.
- Obesity.
- Multiparous mother.
Diagnostic and Therapeutic Procedures and Nursing Interventions

- **Cesarean** delivery if necessary
- **Chest x-ray** to rule out meconium aspiration syndrome
- **Blood glucose levels** to monitor closely for hypoglycemia (less than 40 mg/dL)
- Arterial blood gases may be prescribed due to chronic hypoxia in utero secondary to placental insufficiency
- CBC shows **polycythemia** (hematocrit greater than 65%) from in utero hypoxia
- **Hyperbilirubinemia** resulting from polycythemia as excessive red blood cells break down after birth
- Hypocalcemia may result in response to a long and difficult birth

Data Collection

- Monitor LGA infants for:
  - **Weight above 90th percentile (4,000 g).**
  - **Plump and full-faced** (cushingoid appearance) from increased subcutaneous fat.
  - Signs of **hypoxia.**
  - **Birth trauma** (e.g., fractures, intracranial hemorrhage, and central nervous system injury).
  - Sluggishness, **hypotonic muscles**, and hypoactivity.
  - **Tremors** from **hypocalcemia.**
  - Signs and symptoms of **hypoglycemia.**
  - Signs and symptoms of respiratory distress from immature lungs or meconium aspiration.

- Nursing assessment for LGA infants include:
  - Observing for injury.
  - Reflexes.
  - Early and frequent glucose levels.
  - Monitoring vital signs and temperature.
  - Auscultating lung sounds.
NANDA Nursing Diagnoses

- Risk for injury such as a clavicle fracture related to birth trauma
- Risk for peripheral neurovascular dysfunction related to injury sustained during birth
- Impaired physical mobility related to paralysis of facial or brachial nerve sustained during birth injury
- Ineffective tissue perfusion related to hypoglycemia

Nursing Interventions

- **Nursing interventions** for an LGA infant include:
  - Obtaining early and frequent **heel sticks** (glucose testing).
  - Providing **early feedings** or **intravenous therapy** to **maintain normal glucose** levels.
  - **Thermoregulation** with incubator care.
  - Administering surfactant by endotracheal tube if indicated.
  - Identifying and treating any birth injuries.

Newborn Complication: Hypoglycemia

Key Points

- **Hypoglycemia** is a serum glucose level of **less than 40 mg/dL**. Routine assessment of all newborns, especially LGA infants, should include observing for symptoms of hypoglycemia.

- **Hypoglycemia** – differs for the preterm and term newborn. Hypoglycemia occurring in the first 3 days of life in the term newborn is defined as a blood glucose level of < 40 mg/dL. In the preterm newborn, hypoglycemia is defined as the blood glucose level of < 25 mg/dL.

- **Untreated hypoglycemia** can result in **mental retardation**.
Key Factors

- Maternal diabetes
- Preterm infant
- LGA
- Stress at birth such as cold stress and asphyxia
- Maternal epidural anesthesia

Diagnostic and Therapeutic Procedures and Nursing Interventions

- Two consecutive low plasma glucose levels less than 40 mg/dL in the term infant, less than 25 mg/dL in the preterm infant

Data Collection

- Monitor for **signs** and **symptoms** of **hypoglycemia**.
  - Poor feeding
  - Jitteriness/tremors
  - Hypothermia
  - Diaphoresis
  - Weak shrill cry
  - Lethargy
  - Flaccid muscle tone
  - Seizures/coma

- **Nursing assessments** for **hypoglycemia** include:
  - Monitoring blood glucose level closely.
  - Monitoring IV if unable to orally feed.
  - Monitoring for signs of hypoglycemia.
  - Monitoring vital signs and temperature.

NANDA Nursing Diagnoses

- Disproportionate growth of the neonate related to maternal diabetes
- Imbalanced nutrition: Less than body requirements related to poor feeding
- Risk for injury related to central nervous system complications of hypoglycemia
Nursing Interventions

- **Nursing interventions** for hypoglycemia include:
  - Obtaining blood per **heel stick** for glucose monitoring.
  - Frequent oral and/or gavage feedings or continuos parenteral **nutrition** is provided early after birth to treat hypoglycemia (untreated hypoglycemia can lead to seizures, brain damage, and death).

### Newborn Complication: Small for Gestational Age Infant (SGA)/Intrauterine Growth Restriction (IUGR)

#### Key Points

- **Small for gestational age (SGA)** describes an infant whose birth weight is **at or below the 10\textsuperscript{th} percentile**.
- **Common complications** of SGA infants are perinatal asphyxia, meconium aspiration, hypoglycemia, polycythemia, and instability of body temperature.

#### Key Factors

- **Factors** that **contribute** to a newborn being **SGA** include:
  - Congenital or chromosomal anomalies.
  - Maternal infections, disease, or malnutrition.
  - Gestational hypertension and/or diabetes.
  - Smoking, drug, or alcohol use.
  - Multiple gestations.
  - Placental factors (e.g., small placenta, placenta previa, decreased placental perfusion).
  - Fetal congenital infections such as rubella or toxoplasmosis.

#### Diagnostic and Therapeutic Procedures and Nursing Interventions

- **Chest x-ray** to rule out meconium aspiration syndrome
- **Blood glucose level** for hypoglycemia
- **CBC** will show polycythemia resulting from fetal hypoxia and intrauterine stress
- **ABGs** may be prescribed due to chronic hypoxia in utero due to placental insufficiency
Monitor for **signs and symptoms** of SGA/IUGR.

- **Weight below 10th percentile**
- Normal skull, but reduced body dimensions
- **Reduced subcutaneous fat**
- **Loose, dry skin**
- Decreased muscle mass particularly over the cheeks and buttocks
- **Drawn abdomen** rather than well-rounded
- Thin, dry, yellow, and dull umbilical cord rather than gray, glistening, and moist
- **Scalp hair sparse**
- **Wide skull sutures** from inadequate bone growth
- Signs of respiratory distress and hypoxia
- **Wide-eyed and alert attributed to prolonged fetal hypoxia**
- Signs of meconium aspiration
- Signs of hypoglycemia
- Signs of hypothermia

**Nursing assessments** for SGA infants include:

- Auscultating breath sounds.
- Pulse oximetry.
- Assessing axillary skin temperature every 4 hr.
- Cardiovascular circulation.
- Signs of fatigue or respiratory distress.
- Signs of skin break down.
- Monitoring vital signs and temperature.

**NANDA Nursing Diagnoses**

- Impaired gas exchange related to aspiration of meconium
- Ineffective thermoregulation related to decreased subcutaneous fat
- Imbalanced nutrition: Less than body requirements related to increased metabolic rate
Nursing Interventions

- Nursing interventions for SGA/IUGR infants include:
  - Supporting respiratory efforts and suctioning as necessary to maintain an open airway.
  - Providing a neutral thermal environment (isolette or radiant heat warmer) to prevent cold stress.
  - Initiating early feedings (SGA will have more frequent feedings).
  - Parenteral nutrition if necessary.
  - Administering a partial exchange transfusion to reduce viscosity of the blood if prescribed.
  - Maintaining adequate hydration.
  - Conserving a newborn’s energy level.
  - Preventing skin breakdown.
  - Protecting from infection.
  - Providing support to parents and extended family and encouraging them to participate in newborn care.

Newborn Complication: Hyperbilirubinemia

- Hyperbilirubinemia is an elevation of serum bilirubin levels resulting in jaundice. Jaundice normally appears in a cephalocaudal manner, first being noticed in the head (especially the sclera and mucous membranes), and then progresses down the thorax, abdomen, and extremities.

- Jaundice can be either physiologic or pathologic
  - Physiologic jaundice is considered benign (resulting from normal newborn physiology of increased bilirubin production due to the shortened lifespan and breakdown of fetal RBCs and liver immaturity). The infant with physiological jaundice has no other symptoms and shows signs of jaundice after 24 hr of age.
  - Pathologic jaundice is a result of an underlying disease. Pathologic jaundice appears before 24 hr of age or is persistent after day 7. In the term infant, bilirubin levels increase more than 0.5 mg/dL/hr, peaks at greater than 13 mg/dL, or is associated with anemia and hepatosplenomegaly. Pathologic jaundice is usually caused by a blood group incompatibility or an infection, but may be the result of RBC disorders.
**Kernicterus** (bilirubin encephalopathy) can result from untreated hyperbilirubinemia with **bilirubin levels at or higher than 25 mg/dL**. It is a neurological syndrome caused by bilirubin depositing in brain cells. Survivors may develop cerebral palsy, epilepsy, or mental retardation. They may have minor effects such as learning disorders or perceptual-motor disabilities.

**Key Factors**

**Factors that affect development of hyperbilirubinemia** include:

- Increased RBC production or breakdown.
- **Rh or ABO incompatibility.**
- Decreased liver function.
- Maternal enzymes in breast milk.
- Ineffective breastfeeding.
- Certain medications (aspirin, tranquilizers, and sulfonamides).
- Hypoglycemia.
- Hypothermia.
- Anoxia.

**Diagnostic and Therapeutic Procedures and Nursing Interventions**

**Laboratory testing includes:**

- **Elevated serum bilirubin level** (direct and indirect bilirubin). Monitor the infant’s bilirubin levels every 4 hr until level returns to normal.
- Blood group incapability between the mother and newborn.
- Hemoglobin and hematocrit.
- **Direct Coombs’ test** reveals the presence of antibody-coated (sensitized) Rh-positive RBCs in the newborn.
- Electrolyte levels for dehydration from phototherapy.

**Phototherapy** is the primary treatment of hyperbilirubinemia.

**Data Collection**

**Monitor for signs and symptoms of jaundice** differentiating between pathologic and physiologic jaundice.

- Note yellowish tint to skin, sclera, and mucous membranes.
To verify jaundice, press the infant’s skin on the cheek or abdomen lightly with one finger, then release pressure and observe skin color for yellowish tint as the skin is blanched.

Note time of jaundice onset to distinguish between physiologic and pathologic jaundice.

Assess the underlying cause by reviewing the maternal prenatal, family, and newborn history.

Signs of hypoxia, hypothermia, hypoglycemia, and metabolic acidosis can occur as a result of hyperbilirubinemia and increase the risk of brain damage.

Monitor for **signs** and **symptoms** of **kernicterus**.

- Yellowish skin
- Lethargy
- Hypotonic
- Poor suck
- If untreated, the infant will become hypertonic with backward arching of the neck and trunk
- High-pitched cry
- Fever

**Nursing assessments** for **hyperbilirubinemia** include:

- Observing skin and mucous membranes for signs of jaundice.
- Monitoring vital signs.

**Observe** for **side effects of phototherapy**.

- Bronze discoloration, not a serious complication
- Maculopapular skin rash, not a serious complication
- Development of **pressure areas**
- **Dehydration** (e.g., poor skin turgor, dry mucous membranes, decreased urinary output)
- **Elevated temperature**

**Nursing assessments** during **phototherapy** include:

- Monitoring elimination and weighing daily, watching for signs of dehydration.
- Checking axillary temperature every 4 hr during phototherapy because temperature may become elevated.
NANDA Nursing Diagnoses

- Risk for injury related to hemolytic disease and effects of phototherapy
- Deficient knowledge (parents) related to hyperbilirubinemia and treatment

Nursing Interventions

- **Nursing interventions** for hyperbilirubinemia include:
  - **Feeding early and frequently** – every 3 to 4 hr. This will **promote bilirubin excretion** in the stools.
  - Maintaining **adequate fluid intake** to prevent dehydration.
  - Reassuring the parents that most newborns experience some degree of jaundice.
  - Explaining hyperbilirubinemia, causes, diagnostic tests, and treatment to parents.
  - Explaining that the newborn’s **stool contains** some **bile** that will be **loose and green**.
  - Setting up **phototherapy** if prescribed.
    - Maintaining **eye mask** over the newborn’s eyes for protection of corneas and retinas.
    - Keeping the **newborn undressed** with the exception of a male newborn. A surgical mask should be placed (make like a bikini) over the genitalia to prevent possible testicular damage from heat and light waves. Be sure to remove the metal strip from the mask to prevent burning.
    - **Not applying lotions or ointments** to the infant because they absorb heat and can cause burns.
    - **Removing the newborn from phototherapy every 4 hr** and unmasking the newborn’s eyes and checking for signs of inflammation or injury.
    - **Repositioning the newborn every 2 hr to expose all of the body surfaces** to the phototherapy lights and **prevent pressure sores**.
    - Turning off phototherapy lights before drawing blood for testing.
- Administering an **exchange transfusion** for infants at risk for kernicterus.
Newborn Complications: Congenital Anomalies

Key Points

- Newborns can be born with a multitude of congenital anomalies involving all systems. These are often diagnosed prenatally. A nurse should provide emotional support to the parents who are facing procedures or surgeries to correct the defects.

- Congenital anomalies are present at birth and can involve any of the body systems. Major anomalies causing serious problems include:
  - **Congenital heart disease** (atrial septal defects, ventricular septal defects, coarctation of the aorta, tetralogy of Fallot, transposition of the great vessels, stenosis, atresia of valves).
  - **Neurological defects** (neural tube defects, hydrocephalus, anencephaly, encephalocele, meningocoele, or myelomeningocele).
  - **Gastrointestinal problems** (cleft lip/palate, diaphragmatic hernia, imperforate anus, tracheoesophageal fistula/esophageal atresia, omphalocele, gastroschisis, umbilical hernia, or intestinal obstruction).
  - **Musculoskeletal deformities** (clubfoot, polydactyly, developmental dysplasia of the hip).
  - **Genitourinary deformities** (hypospadias, epispadias, extrophy of the bladder).
  - **Metabolic disorders** (phenylketonuria, galactosemia, hypothyroidism).
  - **Chromosomal abnormalities** (e.g., Down syndrome, which is the most common trisomic abnormality with 47 chromosomes in each cell).

Key Factors

- **Risk factors** for congenital anomalies include genetic and/or environmental factors.
  - Maternal age greater than 40 years
  - Chromosome abnormalities such as Down syndrome
  - Viral infections such as rubella
  - Excessive body heat exposure during the first trimester (neural tube defects)
  - Medications and substance abuse during pregnancy
  - Radiation exposure
  - Maternal metabolic disorders (e.g., phenylketonuria, diabetes mellitus)
• Poor maternal nutrition such as folic acid deficiency (neural tube defects)
• Premature infants
• SGA infants
• Oligohydramnios or polyhydramnios

Diagnostic and Therapeutic Procedures and Nursing Interventions

∆ **Prenatal diagnoses** of congenital anomalies are often made by amniocentesis, chorionic villi sampling, ultrasound, and alpha fetal protein.

∆ **Routine testing** of newborns for **metabolic disorders** (inborn errors of metabolism)

  - **Guthrie test** for phenylketonuria (PKU) showing elevations of phenylalanine in blood and urine. Not reliable until the infant has ingested sufficient amounts of protein.
  - Blood and urine levels of **galactose** (galactosemia)
  - **Thyroxine** measurement (hypothyroidism)

∆ **Cytologic studies** (karyotyping of chromosomes) such as a buccal smear uses cells scraped from the mucosa from inside of the mouth.

∆ **Dermatoglyphics** examines the patterns formed by the ridges in the skin on the digits, palms, and soles (Down syndrome).

∆ Congenital anomalies are generally **identified soon after birth** by Apgar scoring and a brief assessment indicating the need for further investigation. Once identified, congenital anomalies are **treated in a pediatric setting**.

**Data Collection**

∆ Monitor for **signs and symptoms** of **congenital anomalies** including:

  - **Cleft lip/palate** – failure of the lip or hard or soft palate to fuse.
  - **Tracheoesophageal atresia** – failure of the esophagus to connect to the stomach, excessive mucous secretions and drooling, periodic cyanotic episodes and choking, abdominal distention after birth, and immediate regurgitation after birth.
  - **Phenylketonuria (PKU)** – the inability to metabolize the amino acid phenylalanine; can result in mental retardation if untreated.
  - **Galactosemia** – inability to metabolize galactose into glucose. Can result in failure to thrive, cataracts, jaundice, cirrhosis of the liver, sepsis, and mental retardation if untreated.
- **Hypothyroidism** – slow metabolism caused by maternal iodine deficiency or maternal antithyroid medications during pregnancy. Can result in hypothermia, poor feeding, lethargy, jaundice, and cretinism if untreated.

- **Neurologic anomalies (spina bifida)** – a neural tube defect in which the vertebral arch fails to close and there may be a protrusion of the meninges and/or spinal cord.

- **Hydrocephalus** – excessive spinal fluid accumulation in the ventricles of the brain causing the head to enlarge and the fontanels to bulge. Sun-setting sign is common in which the whites of the eyes are visible above the iris.

- **Patent ductus arteriosus (PDA)** – noncyanotic heart defect in which the ductus arteriosus connecting the pulmonary artery and the aorta fails to close after birth. Signs and symptoms consist of murmurs, abnormal heart rate or rhythm, breathlessness, and fatigue while feeding.

- **Tetralogy of Fallot** – cyanotic heart defect characterized by a ventricular septal defect, the aorta positioned over the ventricular septal defect, stenosis of the pulmonary valve, and hypertrophy of the right ventricle. Observe for signs of respiratory difficulties, cyanosis, tachycardia, tachypnea, and diaphoresis.

- **Down syndrome** – oblique palpebral fissures or upward slant of eyes, epicanthal folds, flat facial profile with a depressed nasal bridge and a small nose, protruding tongue, small low-set ears, short broad hands with a fifth finger that has one flexion crease instead of two, a deep crease across the center of the palm frequently referred to as a simian crease, hyperflexibility, and hypotonic muscles.

**Nursing assessments** of infants with **congenital anomalies** include:

- Newborn’s ability to take in adequate nourishment.
- Newborn’s ability to eliminate waste products.
- Vital signs and axillary temperature.
- Infant-parental bonding, observing the parent’s response to the diagnosis of a congenital defect, and encouraging the parents to verbalize concerns.

**NANDA Nursing Diagnoses**

- Risk for impaired parenting related to congenital anomaly of infant
- Risk for injury or death related to congenital anomaly
- Risk for infection related to congenital anomaly or its treatment
- Dysfunctional grieving related to the birth of an infant with a congenital anomaly
- Deficient knowledge related to congenital anomaly and its treatment
Nursing Interventions

△ Nursing interventions for congenital anomalies are dependent upon the type and extent of the anomaly.

- **Neurologic anomalies (spina bifida)**
  - Protect membrane with sterile covering and plastic to prevent drying.
  - Observe for leakage of cerebrospinal fluid.
  - Handle newborn gently by positioning prone or to the side to prevent trauma.
  - Prevent infection by keeping free from contamination by urine and feces.
  - Measure the circumference of the head to identify hydrocephalus.
  - Assess for increased intracranial pressure.

- **Hydrocephalus**
  - Frequently reposition the infant’s head to prevent sores.
  - Measure the infant’s head circumference daily.
  - Assess the infant for signs of increased intracranial pressure such as vomiting and a shrill cry.

- **PDA**
  - Educate the parents about the treatment of surgery.

- **Tetralogy of Fallot**
  - Conserve the infant’s energy to reduce the workload on the heart.
  - Administer gavage feedings or give oral feedings with a special nipple.
  - Elevate the infant’s head and shoulders to improve respirations and reduce the cardiac workload.
  - Prevent infection.
  - Place the infant in a knee-chest position during respiratory distress.

△ **Nursing interventions** for **congenital anomalies** include:

- Establishing and maintaining adequate **respiration**.
- Establishing extrauterine **circulation**.
- Establishing good **thermoregulation**.
- Providing adequate **nutrition**.
  - **Cleft lip/palate** – determine the most effective nipple for feeding. Feed the infant in the upright position to decrease aspiration risk. Feed slowly, burping frequently secondary to tendency to swallow air. Cleanse the mouth with water after feedings.
Tracheoesophageal atresia – withhold feedings until the determination of esophageal patency. Elevate the head of the crib to prevent gastric juice reflux. Supervise the first feeding of all newborns to observe for this anomaly.

PKU – special synthetic formula in which phenylalanine is removed or reduced. Restriction of meat, dairy products, diet drinks, and protein. Aspartame must be avoided.

Galactosemia – give infant a milk substance because galactose is present in milk.

- Administering medications as prescribed such as thyroid replacement for hypothyroidism.
- Educating the parents regarding preoperative and postoperative treatment procedures.
- Encouraging the parents to hold, touch, and talk to their newborn.
- Ensuring that the parents provide consistent care to the newborn.

Newborn Complication: Birth Trauma or Injury

Key Points

- **Birth injury** consists of a physical injury sustained by a newborn during labor and delivery. Most injuries are minor and resolve rapidly. Other injuries may require some intervention. A few are serious enough to be fatal.

- **Types of birth injuries include:**
  - Scalp (e.g., caput succedaneum, cephalohematoma).
  - Skull (e.g., linear fracture, depressed fracture).
  - Intracranial (e.g., epidural or subdural hematoma, cerebral contusion).
  - Spinal cord (e.g., spinal cord transaction or injury, vertebral artery injury).
  - Plexus (e.g., total brachial plexus injury, Klumpke paralysis).
  - Cranial and peripheral nerve (e.g., radial nerve palsy, diaphragmatic paralysis).

Key Factors

- **Maternal, intrapartum, obstetric birth techniques, and newborn factors may predispose the newborn to injuries.** These include:
  - Fetal macrosomia.
  - Abnormal or difficult presentations.
• Uterine dysfunction leading to precipitate or prolonged labor.
• Cephalopelvic disproportion.
• Multifetal gestation.
• Congenital abnormalities.
• Internal FHR monitoring.
• Forceps or vacuum extraction.
• External version.
• Cesarean birth.

Diagnostic and Therapeutic Procedures and Nursing Interventions

Delta  **Birth injuries** are normally diagnosed by CT scan, x-ray of suspected area of fracture, or neurological exam to determine paralysis of nerves.

Data Collection

Delta  Monitor the newborn for **signs** and **symptoms** of **birth injuries**, which include:

• Irritability, seizures, and depression. These are all signs of a **subarachnoid hemorrhage**.
• Facial flattening and unresponsiveness to grimace that accompanies crying or stimulation, and the eye remaining open are symptoms to assess for **facial paralysis**.
• Weak or hoarse cry, which is characteristic of **laryngeal nerve palsy** from excessive traction on the neck.
• Flaccid muscle tone, which may signal **joint dislocations and separation** during birth.
• Flaccid muscle tone of the extremities, which is suggestive of **nerve plexus injuries** or **long bone fractures**.
• Limited motion of an arm, crepitus over a clavicle, and absence of Moro reflex on the affected side, which are symptoms of **clavicular fractures**.
• Flaccid arm with the elbow extended and the hand rotated inward, absence of the Moro reflex on the affected side, sensory loss over the lateral aspect of the arm, and intact grasp reflex, which are symptoms of **Erb-Duchenne paralysis** (brachial paralysis).
• Localized discoloration, ecchymosis, petechiae, and edema over the presenting part. These are seen with **soft tissue injuries**.
Nursing assessments for birth injuries include:

- **Reviewing maternal history** and looking for factors that may predispose the newborn to injuries.
- **Apgar scoring** that might indicate a possibility of birth injury. Neonates in need of immediate resuscitation should be identified.
- **Initial head to toe physical assessment** and **continued assessment** upon each contact with the neonate.
- **Vital signs** and temperature.

NANDA Nursing Diagnoses

- Injury related to birth trauma
- Impaired physical mobility related to brachial plexus injury
- Impaired gas exchange related to diaphragmatic paralysis
- Acute pain related to injury

Nursing Interventions

Nursing interventions for birth injuries include:

- Administering **treatment** to the newborn **based on** the injury and according to the primary care provider’s prescriptions.
- **Preventing further trauma** by **decreasing stimuli** and movement.
- Educating the infant’s parents and family regarding the injury and the management of the injury.
- Promoting parent-newborn bonding.

**Newborn Complication: Neonatal Infection/Sepsis (Sepsis Neonatorum)**

Key Points

- **Infection** may be contracted by the newborn before, during, or after delivery. Newborns are more susceptible to micro-organisms because of their limited immunity and inability to localize infection. The infection can therefore spread rapidly into the bloodstream.

- **Neonatal sepsis** is the presence of micro-organisms or their toxins in the blood or tissues of the infant during the first month after birth. Signs of sepsis are subtle and may resemble other diseases; the nurse often notices them during routine care of the infant.
Prevention of infection and neonatal sepsis starts perinatally with maternal screening for infections, prophylactic interventions, and the use of sterile and aseptic techniques during delivery. Prophylactic antibiotic treatment of the eyes of all newborns and appropriate umbilical cord care also help to prevent neonatal infection and sepsis.

Key Factors

Risk factors for infection/sepsis of the newborn include:

- Premature rupture of the membranes.
- TORCH (toxoplasmosis, rubella, cytomegalovirus, and herpes).
- Chorioamnionitis.
- Premature birth.
- Low birth weight.
- Substance abuse.
- Maternal urinary tract infection.
- Meconium.
- Human immunodeficiency virus (HIV) transmitted from the mother to the newborn perinatally through the placenta and postnatally through the breast milk.

Diagnostic and Therapeutic Procedures and Nursing Interventions

Complete septic workup includes:

- CBC.
- Blood, urine, and cerebrospinal fluid cultures and sensitivities.

Positive blood cultures, usually polymicrobial (more than one pathogen) indicates the presence of infection/sepsis.

- Organisms frequently responsible for neonatal infections include: Staphylococcus aureus, S. epidermidis, Escherichia coli, Haemophilus influenza, and group B Streptococcus.

Chemical profile shows a fluid and electrolyte imbalance.
Data Collection

Monitor for signs and symptoms of neonatal infection/sepsis, which include:

- Temperature instability.
- Suspicious drainage (e.g., eyes, umbilical stump).
- Poor feeding pattern, such as a weak suck or decreased intake.
- Vomiting and diarrhea.
- Poor weight gain.
- Abdominal distention, large residual if feeding by gavage.
- Apnea, sternal retractions, grunting, and nasal flaring.
- Decreased oxygen saturation.
- Color changes such as jaundice, pallor, and petechiae.
- Tachycardia or bradycardia.
- Poor muscle tone and lethargic.

Nursing assessments for neonatal infection/sepsis include:

- Assessing infection risks (review maternal record).
- Monitoring for signs of opportunistic infection.
- Monitoring vital signs continuously.
- Axillary temperature.
- Pulse oximetry.
- Assessing for weight loss.
- Monitoring fluid and electrolyte status.
- Monitoring visitors for infection.

NANDA Nursing Diagnoses

- Infection related to maternal infection, need for indwelling intrauterine devices, or neonatal contact with pathogen
- Ineffective thermoregulation related to infection
- Impaired tissue integrity related to invasive procedures
Nursing Interventions

- **Nursing interventions** for neonatal infections/sepsis include:
  - **Obtaining specimens** (blood, urine, and stool) to assist in identifying the causative organism.
  - Initiating and maintaining **IV therapy** as prescribed to administer electrolyte replacements, fluids, and medications.
  - Administering **medications** as prescribed (e.g., broad-spectrum antibiotics prior to cultures being obtained).
  - Initiating and maintaining **respiratory support** as needed.
  - Providing newborn care to **maintain temperature**.
  - Maintaining standard precautions.
  - Cleaning and sterilizing all equipment to be used.
  - Providing family education on infection control, which includes:
    - Instructing the family on the use of clean bottles and nipples for each feeding.
    - Not storing leftover formula.
    - Supervising handwashing.
  - Providing emotional support to the family.

Newborn Complication: Maternal Substance Abuse During Pregnancy

- **Maternal substance abuse during pregnancy** consists of any use of alcohol or drugs during pregnancy. Intrauterine drug exposure can cause anomalies, neurobehavioral changes, and signs of withdrawal. These changes depend on specific drug or combination of drugs used, dosage, route of administration, metabolism and excretion by mother and fetus, timing of drug exposure, and length of drug exposure.

- **Substance withdrawal** in the newborn occurs when the mother uses illicit drugs while pregnant.

- **Fetal alcohol syndrome (FAS)** results from the chronic or periodic intake of alcohol during pregnancy. Alcohol is considered teratogenic, so the daily intake of alcohol increases the risk of FAS.
Newborns with FAS are at risk for specific congenital physical defects, along with long-term complications including:

- Feeding problems.
- Central nervous system dysfunction (e.g., mental retardation, cerebral palsy).
- Behavioral difficulties such as hyperactivity.
- Language abnormalities.
- Future substance abuse.
- Delayed growth and development.
- Poor maternal-infant bonding.

**Key Factors**

**Risk factors** for maternal substance abuse during pregnancy include:

- Mother using substances prior to knowing she is pregnant.
- Maternal substance abuse and addiction.

**Diagnostic and Therapeutic Procedures and Nursing Interventions**

**Drug screen** of urine or meconium to reveal the agent abused by the mother.

**Chest x-ray** for FAS to rule out congenital heart defects.

**Blood tests** should be done to differentiate between neonatal drug withdrawal and central nervous system irritability. Tests should include:

- CBC.
- Blood glucose.
- Calcium.
- Magnesium.
- TSH, T₄, T₃.
- ABS.
Monitor for signs and symptoms of neonatal abstinence syndrome (withdrawal) in the neonate using the neonatal abstinence scoring system that assesses for and scores the following:

- **Central nervous systems** – irritability, tremors, high-pitched, shrill cry, incessant crying, hyperactive with increased Moro reflex, increased deep tendon reflexes, increased muscle tone, increased wakefulness, excoriations on the knees and face, and convulsions.

- **Metabolic, vasomotor, and respiratory** – nasal congestion with flaring, tachypnea, sweating, frequent yawning, skin mottling, tachypnea greater than 60/min, temperature greater than 37.2°C (99°F).

- **Gastrointestinal** – poor feeding, vomiting, regurgitation (projectile vomiting), diarrhea, and excessive, uncoordinated, and constant sucking.

**Opiate withdrawal** can last for 2 to 3 weeks.

- Signs and symptoms of neonatal abstinence syndrome include rapid changes in mood, hypersensitivity to noise and external stimuli, dehydration, and poor weight gain.

**Heroin withdrawal**

- Signs and symptoms of neonatal abstinence syndrome include low birth weight and SGA, decreased Moro reflexes (rather than increased), and hypothermia or hyperthermia.

**Methadone withdrawal**

- Signs and symptoms of neonatal abstinence syndrome include an increased incidence of seizures, higher birth weights, and higher risk of sudden infant death syndrome.

**Marijuana withdrawal**

- Signs and symptoms include preterm birth and meconium staining.

**Amphetamine withdrawal**

- Preterm or SGA, drowsiness, jitters, respiratory distress, frequent infections, poor weight gain, emotional disturbances, and delayed growth and development.
Fetal alcohol syndrome

- Facial anomalies include eyes with epicanthal folds, strabismus, and ptosis; mouth with a poor suck, cleft lip or palate, and small teeth
- Deafness
- Abnormal palmar creases and irregular hair
- Many vital organ anomalies such as heart defects including atrial and ventricular septal defects, teratology of Fallot, and patent ductus arteriosus
- Developmental delays and neurologic abnormalities
- Prenatal and postnatal growth retardation
- Sleep disturbances

Tobacco

- Prematurity, low birth weight, increased risk for sudden infant death syndrome, increased risk for bronchitis, pneumonia, and developmental delays

Nursing assessments for maternal substance abuse and neonatal effects or withdrawal include:

- Apgar scoring.
- Head to toe physical assessment.
- Eliciting and assessing reflexes.
- Monitoring infant’s ability to feed and digest intake.
- Monitoring fluids and electrolytes such as skin turgor, mucous membranes, fontanel, and I&O.
- Observing the infant’s behavior.
- Vital signs and temperature.
- Measuring and weighing of the neonate.
- Observing parent-infant bonding.

NANDA Nursing Diagnoses

- Risk for injury related to hyperactivity or seizures
- Risk for deficient fluid volume related to vomiting and diarrhea
- Altered nutrition: Less than body requirements related to poor suck reflex
Nursing Interventions

Nursing interventions for the effects on the neonate of substance abuse during pregnancy or substance withdrawal include:

- Administering medications as prescribed to decrease central nervous system irritability and control seizures.
- Reducing external stimulation.
- Swaddling the newborn snuggly to reduce self stimulation and protect the skin from abrasions.
- Frequent, small feedings of high-calorie formula – may need gavage feedings.
- Elevating the infant’s head during and following feedings, and burping the infant well to reduce vomiting and aspiration.
- Trying various nipples to compensate for a poor suck reflex.
- Having suction available to reduce the risk for aspiration.
- For cocaine addicted infants, avoiding eye contact and using vertical rocking and a pacifier.
- Preventing infection.
- Referring mother to a drug and/or alcohol treatment center.

Primary Reference:

Additional Resources:


Chapter 23: Assessment and Management of Newborn Complications

Application Exercises

Scenario: A nurse is called to the birthing room to assist with the assessment of a 32-week gestation newborn and to provide care to the mother postpartum. The infant’s birth weight is 1,100 g. The infant’s Apgar scores are 3 at 1 min and 7 at 5 min. The infant is experiencing nasal flaring, grunting, and substernal and intercostal retractions. He is flaccid and lying in a frog-like position. The infant is covered with a thick, cheesy substance (vernix caseosa), and lanugo is widely distributed over his body.

1. Which of the following are characteristics of a preterm infant that the nurse may see at this birth? (Select all that apply.)

   - Large head in comparison to body
   - Lanugo
   - Long hair
   - Long nails
   - Weak grasp reflex
   - Translucent skin
   - Plump face

2. What assessment findings indicate that a complication may be developing for this newborn?

3. Why is this infant at risk for ineffective thermoregulation?

4. A nurse is caring for an infant with a high bilirubin level who is receiving high intensity light treatments (phototherapy). The nurse’s highest assessment priority in monitoring this infant is to check frequently and carefully for signs of which of the following common and potential serious complications of phototherapy?

   A. Retinal damage
   B. Bronze skin discoloration
   C. Dehydration
   D. Maculopapular skin rash
5. A nurse assesses a term newborn delivered less than 1 hr ago. The nurse suspects a problem based on the infant’s

A. relaxed posture.
B. clenched fists.
C. startle reaction.
D. stepping movements.

6. A multiparous woman at 40 weeks of gestation has just given birth to her newborn. After prolonged pushing in the second stage, a forceps-assisted birth was necessary. The newborn weighs 9 lb, 8 oz (4,318 g). The newborn has marked caput succedaneum and marked bruising about the face, head, and shoulders. How would a nurse characterize this infant? (Select all that apply.)

____ Preterm
____ Term
____ Postterm
____ LGA
____ SGA
____ AGA

7. A nurse is examining an infant who was just delivered to a woman at 41 weeks gestation. Which of the following characteristics indicates that this infant is postterm?

A. Abundant lanugo
B. Flat areola without breast buds
C. Heels movable fully to the ears
D. Leathery, cracked, wrinkled skin
8. To evaluate the efficacy of synthetic surfactant given to a preterm infant diagnosed with RDS, the nurse’s first priority in assessment is monitoring the infant’s
   A. oxygen saturation.
   B. body temperature.
   C. bilirubin levels.
   D. heart rate.

9. A nurse should consider the possibility of neonatal withdrawal syndrome if a newborn
   A. has decreased muscle tone.
   B. has a continuous high-pitched cry.
   C. sleeps for 2 hr after feeding.
   D. has mild tremors when disturbed.

10. The parent of a postterm infant is concerned because his infant’s skin is dry and peeling. Which of the following responses by the nurse is most appropriate?
    A. “This type of skin is an expected finding in babies born after 42 weeks of gestation.”
    B. “It would be best for you to ask the pediatrician about the condition of your baby’s skin.”
    C. “Peeling skin is common in some families. Have you seen this in other infants in your family?”
    D. “Don’t worry. We have several skin preparations we can apply to help resolve this condition.”

11. A newborn is delivered at 39 weeks. The neonatal nurse plots the infant’s weight and finds it to be in the 8th percentile for weight. This infant would be classified as
    A. term and AGA.
    B. preterm and LGA.
    C. term and SGA.
    D. postterm and SGA.

12. Which of the following nutritional problems should the nurse observe for in a preterm neonate?
    A. Hypoglycemia
    B. Hyperglycemia
    C. Anemia
    D. Galactosemia
Chapter 23: Assessment and Management of Newborn Complications

Application Exercises Answer Key

Scenario: A nurse is called to the birthing room to assist with the assessment of a 32-week gestation newborn and to provide care to the mother postpartum. The infant’s birth weight is 1,100 g. The infant’s Apgar scores are 3 at 1 min and 7 at 5 min. The infant is experiencing nasal flaring, grunting, and substernal and intercostal retractions. He is flaccid and lying in a frog-like position. The infant is covered with a thick, cheesy substance (vernix caseosa), and lanugo is widely distributed over his body.

1. Which of the following are characteristics of a preterm infant that the nurse may see at this birth? Select all that apply.

- [X] Large head in comparison to body
- [X] Lanugo
- [ ] Long hair
- [ ] Long nails
- [X] Weak grasp reflex
- [X] Translucent skin
- [ ] Plump face

Characteristics of a preterm infant include large head in comparison to body, lanugo over the body, a weak grasp reflex, and skin that is thin, smooth, shiny, and may be translucent. Long hair and nails are signs of a postterm infant. A plump face would be seen in a macrosomic infant.

2. What assessment findings indicate that a complication may be developing for this newborn?

Nasal flaring, grunting, and substernal and intercostal retractions indicate that the infant is experiencing respiratory distress. The frog-like position, vernix caseosa, and lanugo are the usual assessment findings for a premature newborn at 32 weeks gestation.
3. Why is this infant at risk for ineffective thermoregulation?

The infant’s low birth weight and gestational age mean that it has little glycogen stored in its liver and little brown fat available for producing heat. The preterm infant lacks subcutaneous fat to insulate his body and his flaccid muscle tone does not allow him to take a flexed position to prevent heat loss.

4. A nurse is caring for an infant with a high bilirubin level who is receiving high intensity light treatments (phototherapy). The nurse’s highest assessment priority in monitoring this infant is to check frequently and carefully for signs of which of the following common and potential serious complications of phototherapy?

   A. Retinal damage
   B. Bronze skin discoloration
   C. **Dehydration**
   D. Maculopapular skin rash

Infants receiving phototherapy lose more water and have loose stools due to increased bilirubin excretion. This increases their risk of dehydration, a serious and sometimes life-threatening complication in an infant. Supplemental oral or intravenous fluids are given as needed to prevent this complication. It is not known whether or not phototherapy causes retinal damage; nevertheless, it is standard procedure to protect the infant’s eyes by closing them and then covering them with eye patches while the infant is exposed to phototherapy. Due to the confinement of the patches, it is important for the nurse to assess the infant’s eyes between therapy sessions for signs of conjunctivitis. However, the nurse would not be able to detect signs of retinal damage during routine assessments. Some infants who have elevated direct serum bilirubin levels develop a bronze discoloration as a side effect of phototherapy. This is not a serious complication. Infants can also develop a maculopapular skin rash as a side effect of phototherapy. Again, this is not a serious complication. Because the infant’s opportunities to be held are limited, the nurse must assess the infant’s skin carefully for development of pressure areas and must change the infant’s position at least every 2 hr.
5. A nurse assesses a term newborn delivered less than 1 hr ago. The nurse suspects a problem based on the infant’s

A. **relaxed posture.**
B. clenched fists.
C. startle reaction.
D. stepping movements.

A relaxed position indicates hypotonia, which is a possible result of hypoxia in utero or medications received by the mother. The nurse would expect to find fist clenching in a newborn. Straightened legs that are not flexed at the knees are an expected finding following a breech presentation. The nurse should review the delivery record before concluding that this finding represents a problem. It is expected that a newborn’s legs would move one at a time as though the infant were pedaling a bicycle.

6. A multiparous woman at 40 weeks of gestation has just given birth to her newborn. After prolonged pushing in the second stage, a forceps-assisted birth was necessary. The newborn weighs 9 lb, 8 oz (4,318 g). The newborn has marked caput succedaneum and marked bruising about the face, head, and shoulders. How would a nurse characterize this infant? (Select all that apply.)

- [ ] Preterm
- [X] **Term**
- [ ] Postterm
- [X] LGA
- [ ] SGA
- [ ] AGA

The infant is term (40 weeks) and LGA (greater than 90th percentile in weight). Preterm is prior to 37 weeks gestation and postterm is after the completion of the 42nd week of gestation. SGA is an infant that is at or below the 10th percentile in weight. AGA is between the 10th and 90th percentile for weight.
7. A nurse is examining an infant who was just delivered to a woman at 41 weeks gestation. Which of the following characteristics indicates that this infant is postterm?

A. Abundant lanugo  
B. Flat areola without breast buds  
C. Heels movable fully to the ears  
D. **Leathery, cracked, wrinkled skin**

Leathery, cracked, and wrinkled skin is seen in a postterm newborn due to placental insufficiency. Abundant lanugo, flat areolas without breast buds, and heels movable fully to ears are found in preterm newborns.

8. To evaluate the efficacy of synthetic surfactant given to a preterm infant diagnosed with RDS, the nurse’s first priority in assessment is monitoring the infant’s

A. oxygen saturation.  
B. body temperature.  
C. bilirubin levels.  
D. heart rate.

Surfactant contains surface-active phospholipids, specifically lecithin and sphingomyelin, that are critical for alveolar stability. Surfactant therapy stabilizes the alveoli and prevents collapse, thereby increasing lung compliance and maintaining or improving oxygen saturation. Surfactant would not have a direct effect on body temperature, thus it would not reflect the efficacy of this treatment. However, cold stress increases the amount of oxygen the newborn needs. Hypothermia in a newborn can lead to metabolic acidosis, hypoxia, and shock. The nurse must provide a neutral thermal environment for this infant and monitor body temperature continuously. Surfactant does not have a direct effect on bilirubin levels; however, preterm infants are prone to hyperbilirubinemia and so this parameter must be monitored and treated as needed. However, serum bilirubin level is not a reflection of the efficacy of surfactant. It is important to monitor the heart rate of any preterm infant, as well as any infant who has RDS. Since surfactant can cause bradycardia, this is an especially important assessment parameter for this infant. However, heart rate is not a reflection of the efficacy of surfactant therapy.
9. A nurse should consider the possibility of neonatal withdrawal syndrome if a newborn

A. has decreased muscle tone.

**B. has a continuous high-pitched cry.**

C. sleeps for 2 hr after feeding.

D. has mild tremors when disturbed.

Symptoms of withdrawal from maternal substance abuse include central nervous system disturbances such as an excessive or continuous high-pitched cry and a markedly hyperactive Moro reflex. An infant withdrawing from narcotics or other substances abused maternally is likely to have an increased muscle tone along with other central nervous system disturbances. Most newborns sleep for varying amounts of time after feeding. Symptoms of withdrawal from maternal substance abuse include difficulty moving through various sleep stages. These infants might only sleep for very short periods of time. This sleep pattern disturbance is related to central nervous system excitation secondary to drug or alcohol withdrawal. Many newborns have mild tremors when they are disturbed. What distinguishes infants who have neonatal abstinence syndrome from this normal pattern is that they have moderate to severe tremors when they are undisturbed.

10. The parent of a postterm infant is concerned because his infant’s skin is dry and peeling. Which of the following responses by the nurse is most appropriate?

A. “This type of skin is an expected finding in babies born after 42 weeks of gestation.”

B. “It would be best for you to ask the pediatrician about the condition of your baby’s skin.”

C. “Peeling skin is common in some families. Have you seen this in other infants in your family?”

D. “Don’t worry. We have several skin preparations we can apply to help resolve this condition.”

Peeling skin is a normal condition seen in postterm newborns due to dehydration from placental insufficiency. There is no need to ask the primary care provider as this is a normal finding in postterm newborns. A condition of peeling skin in the family would not show up as early as the newborn period. Lotions will not help with the peeling because it is due to lack of nutrition. The peeling will resolve once the newborn receives adequate nutrition and fluids.
11. A newborn is delivered at 39 weeks. The neonatal nurse plots the infant’s weight and finds it to be in the 8th percentile for weight. This infant would be classified as

A. term and AGA.
B. preterm and LGA.
**C. term and SGA.**
D. postterm and SGA.

This newborn is term, between 37 and 42 weeks gestation, SGA, and below the 10th percentile.

12. Which of the following nutritional problems should the nurse observe for in a preterm neonate?

A. Hypoglycemia
B. Hyperglycemia
C. Anemia
D. Galactosemia

A preterm neonate is at risk for hypoglycemia because it has not built up glycogen reserves yet. A preterm infant will have polycythemia and excessive red blood cells rather than anemia. Galactosemia is the inability of the neonate to convert galactose to glucose and is an inborn error of metabolism.