N305 Focus Sheet 5 Sp 19—Newborn, RKC Ch 17, 18, 23, 24; ATI Ch 23-27 ; Newborn Assessment Power Point; breastfeeding power point; Newborn reflexes
RKC 17 & 18; ATI Ch 23

1. What does APGAR stand for?

APGAR stands for:

- ➔ **A**ppearance
- ➔ **P**ulse
- ➔ **G**rimace
- ➔ **A**ctivity
- ➔ **R**espiration

2. When are APGAR scores assigned?

- ➔ An Apgar score is assigned based on a quick review of systems that is completed at 1 and 5 minutes of life

3. What is a "normal" APGAR score versus a score that requires an intervention?

- ➔ 0 to 3 indicates severe distress
- ➔ 4 to 6 indicates moderate difficulty
- ➔ 7 to 10 indicates minimal or no difficulty with adjusting to extrauterine life

Must know how to calculate this!!!!!

Apgar Scoring System

Indicator		0 Points	1 Point	2 Points
A	Activity (muscle tone)	Absent	Flexed arms and legs	Active
P	Pulse	Absent	Below 100 bpm	Over 100 bpm
G	Grimace (reflex irritability)	Floppy	Minimal response to stimulation	Prompt response to stimulation
A	Appearance (skin color)	Blue; pale	Pink body, Blue extremities	Pink
R	Respiration	Absent	Slow and irregular	Vigorous cry

4. Describe the Initial assessment of a newborn immediately after birth?

- ➔ **External assessment**: Skin color, peeling, birthmarks, foot creases, breast tissue, nasal patency, and meconium staining (can indicate fetal hypoxia)
- ➔ **Chest**: Point of maximal impulse location, ease of breathing; auscultation for heart rate and quality of tones; and respirations for crackles, wheezes, and equality of bilateral breath sounds
- ➔ **Abdomen**: Rounded abdomen and umbilical cord with one vein and two arteries
- ➔ **Neurologic**: Muscle tone and reflex reaction (Moro reflex); palpation for the presence and size of fontanels and sutures; assessment of fontanels for fullness or bulge
- ➔ **Other observations**: Inspection for gross structural malformations

- **Expected Reference Ranges**:
  - **Weight**: 2,500 to 4,000 g (5.5 to 8.8 pounds)
  - **Length**: 45 to 55 cm (18 to 22 inches)
  - **Head circumference**: 32 to 36.8 cm (12.6 to 14.5 inches)
  - **Chest circumference**: 30 to 33 cm (12 to 13 inches)

5. What are the normal expected ranges for a newborn for each of the following

Weight	2,500 to 4,000 g (5.5 to 8.8 pounds)
Length (crown of head to to heel of foot)	45 to 55 cm (18 to 22 inches)
Head circumference (occipital to frontal)	32 to 36.8 cm (12.6 to 14.5 inches)
Chest circumference (nipple line)	30 to 33 cm (12 to 13 inches)
Temperature	36.5 to 37.5 C (97.7 to 99.5 F)
Pulse	110 to 160/min
Respiration	30 to 60/min
Blood Pressure	60/40 to 80/50 mm Hg

6. What does the New Ballard Scale (gestational age assessment) assess? (There is a PPT in the Resources with a link to at You-Tube video on the New Ballard Scale)

A newborn maturity rating scale that assesses neuromuscular and physical maturity

- Each individual assessment parameter displays at least six ranges of development along a continuum
- Each range of development within an assessment is assigned a number value from -1 to 5. the totals are added to give a maturity rating in weeks gestation (Ex: a score of 35 indicates 38 weeks gestation)

Neuromuscular Maturity

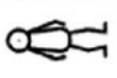
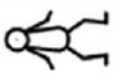
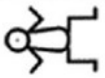
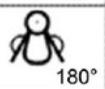
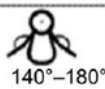
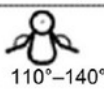
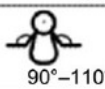
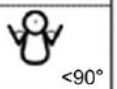
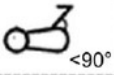
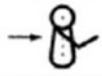
- Posture ranging from fully extended to fully flexed (0 to 4)
- Square window formation with the neonate's wrist (-1 to 4)
- Arm recoil, where the neonate's arm is passively extended and spontaneously returns to flexion (0 to 4)
- Popliteal angle, which is the degree of the angle to which the newborn's knees can extend (-1 to 5)
- Scarf sign, which is crossing the neonate's arm over the chest (-1 to 4)
- Heel to ear, which is how far the neonate's heels reach to her ears (-1 to 4)

Physical Maturity

- Skin texture, ranging from sticky and transparent, to leathery, cracked, and wrinkled (-1 to 5)
- Lanugo presence and amount, ranging from none, sparse, abundant, thinning, bald, or mostly bald (-1 to 4)
- Plantar surface creases, ranging from less than 40 mm to creases over the entire sole (-1 to 4)
- Breast tissue amount, ranging from imperceptible, to full areola with a 5 to 10 bud (-1 to 4)
- Eyes and ears for amount of eye opening and ear cartilage present (-1 to 4)

➔ Genitalia development, ranging from flat smooth scrotum to pendulous testes with deep rugae for males (-1 to 4), and prominent clitoris with flat labia to the labia majora covering the labia minora and clitoris for females (-1 to 4)

Neuromuscular Maturity

Score	-1	0	1	2	3	4	5
Posture							
Square window (wrist)	 >90°	 90°	 60°	 45°	 30°	 0°	
Arm recoil		 180°	 140°–180°	 110°–140°	 90°–110°	 <90°	
Popliteal angle	 180°	 160°	 140°	 120°	 100°	 90°	 <90°
Scarf sign							
Heel to ear							

Physical Maturity

Skin	Sticky, friable, transparent	Gelatinous, red, translucent	Smooth, pink; visible veins	Superficial peeling and/or rash; few veins	Cracking, pale areas; rare veins	Parchment, deep cracking; no vessels	Leathery, cracked wrinkled
Lanugo	None	Sparse	Abundant	Thinning	Bald areas	Mostly bald	**Maturity Rating**
Plantar surface	Heel-toe 40-50 mm: –1 <40 mm: –2	>50 mm, no crease	Faint red marks	Anterior transverse crease only	Creases anterior ⅔	Creases over entire sole	
Breast	Imperceptible	Barely perceptible	Flat areola, no bud	Stippled areola, 1–2 mm bud	Raised areola, 3–4 mm bud	Full areola, 5–10 mm bud	
Eye/Ear	Lids fused loosely: –1 tightly: –2	Lids open; pinna flat; stays folded	Slightly curved pinna; soft; slow recoil	Well curved pinna; soft but ready recoil	Formed and firm, instant recoil	Thick cartilage, ear stiff	
Genitals (male)	Scrotum flat, smooth	Scrotum empty, faint rugae	Testes in upper canal, rare rugae	Testes descending, few rugae	Testes down, good rugae	Testes pendulous, deep rugae	
Genitals (female)	Clitoris prominent, labia flat	Clitoris prominent, small labia minora	Clitoris prominent, enlarging minora	Majora and minora equally prominent	Majora large, minora small	Majora cover clitoris and minora	

Score	Weeks
-10	20
-5	22
0	24
5	26
10	28
15	30
20	32
25	34
30	36
35	38
40	40
45	42
50	44

7. Define AGA, SGA, LGA, IUGR, term, preterm or premature, post term or postdate, postmature.

➔ Appropriate for gestational age (AGA)
- ◆ Weight is between 10th and 90th percentile

➔ Small for gestational age (SGA)
- ◆ Weight is less than the 10th percentile

➔ Large for gestational age (LGA)
- ◆ Weight is greater than the 90th percentile

➔ Intrauterine growth restriction (IUGR)

- ◆ Growth rate does not meet expected norms

➔ Term
- ◆ Birth between the beginning of week 37 and prior to the end of 42 weeks of gestation

➔ Preterm or premature
- ◆ Born prior to the completion of 37 weeks of gestation

➔ Postterm or postdate
- ◆ Born after the completion of 42 weeks of gestation

➔ Postmature
- ◆ Born after the completion of 42 weeks of gestation with evidence of placental insufficiency

8. Review and summarize each component of the physical exam (Also see power point slides) (There is a PPT in the Resources with a link to at You-Tube video on the newborn reflexes)

Posture: Lying in a curled-up position with arms and legs in moderate flexion; Resistant to extension of extremities

Skin: Skin color should be pink or acrocyanotic with no jaundice present on the first day. Secondary to increased bilirubin, jaundice can appear on the third day of life, but then decrease spontaneously. Skin turgor should be present, showing that the newborn is well hydrated. the skin should spring back immediately when pinched. texture should be dry, soft, and smooth, showing good hydration. cracks in hands and feet can be present. In full-term newborns, desquamation (peeling) occurs a few days after birth. Vernix caseosa (protective, thick, cheesy covering) amounts vary, with more present in creases and skin folds. Lanugo (fine downy hair) varies regarding the amount present. It is usually found on the pinnae of ears, forehead, and shoulders.

Lanugo:

Vernix caseosa

MILIA: SMALL RAISED WHITE SPOTS ON THE NOSE, CHIN, AND FOREHEAD CAN BE PRESENT. THESE SPOTS DISAPPEAR SPONTANEOUSLY WITHOUT TREATMENT AND PARENTS SHOULD NOT SQUEEZE THEM.

Telangiectatic nevi: (Stork bites) Flat pink or red marks that easily blanch and are found on the back of the neck, nose, upper eyelids, and middle of the forehead. They usually fade by the second year of life.

Nevus flammeus: (Port wine stain) Is a capillary angioma below the surface of the skin that is purple or red, varies in size and shape, is commonly seen on the face, and does not blanch or disappear.

Erythema toxicum: (Erythema neonatorum) Is a pink rash that appears suddenly anywhere on the body of a term newborn during the first 3 weeks. This is frequently referred to as newborn rash. No treatment is required.

Head: Head should be 2 to 3 cm larger than chest circumference. If the head circumference is greater than or equal to 4 cm larger than the chest circumference, this can be an indication of hydrocephalus (excessive cerebral fluid within the brain cavity surrounding the brain). If the head circumference is less than or equal to 32 cm, this can be an indication of microcephaly (abnormally small head). Anterior fontanel should be palpated and approximately 5 cm on average and diamond shaped. Posterior fontanel is smaller and triangle-shaped. Fontanels should be soft and flat. Fontanels can bulge when the newborn cries, cough, or vomits, and are flat when the newborn is quiet. Bulging fontanels can indicate increased intracranial pressure, infection, or hemorrhage. Depressed fontanels can indicate dehydration. Sutures should be palpable,

separated, and can be overlapping (moldingm), a normal occurrence resulting from head compression during labor.

Caput succedaneum: (Localized swelling of the soft tissues of the scalp caused by pressure on the head during labor) is an expected finding that can be palpated as a soft edematous mass and can cross over the suture line. Caput succedaneum usually resolves in 3 to 4 days and does not require treatment.

Cephalohematoma: Is a collection of blood between the periosteum and the skull bone that it covers. It does not cross the suture line. It results from trauma during birth such as pressure of the fetal head against the maternal pelvis in a prolonged difficult labor or forceps delivery. It appears in the first 1 to 2 days after birth and resolves in 2 to 3 weeks.

Eyes: Assess eyes for symmetry in size and shape. Each eye and the space between the eyes should equal one-third the distance from the inner to the outer canthus of both eyes to rule out chromosomal abnormalities, such as down syndrome. Eyes are usually blue or gray following birth. Lacrimal glands are immature, with minimal or no tears. Subconjunctival hemorrhages can result from pressure during birth. Pupillary and red reflex are present. Eyeball movement will demonstrate random, jerky movements.

Ears: When examining the placement of ears, draw an imaginary line through the inner to the outer canthus of the newborn's eye. The eye should be even with the upper tip of the pinna of the newborn's ear. Ears that are low-set can indicate a chromosome abnormality, such as down syndrome, or a kidney disorder. Cartilage should be firm and well formed. Lack of cartilage indicates prematurity. The newborn should respond to voices and other sounds. Inspect ears for skin tags.

Nose: The nose should be midline, flat, and broad with lack of a bridge. Some mucus should be present, but with no drainage. Newborns are obligate nose breathers and do not develop the response of opening the mouth with a nasal blockage can result in flaring of the nares, cyanosis, or asphyxia. Newborns sneeze clear nasal passages.

Mouth: Assess for palate closure and strength of sucking. Lip movements should be symmetrical. Saliva should be scant. Excessive saliva can indicate a tracheoesophageal fistula. Epstein's pearls (small white cysts found on the gums and at the junction of the soft and hard palates) are expected findings. They result from the accumulation of epithelial cells and disappear a few weeks after birth. Tongue should move freely, be symmetrical in shape, and not protrude. (A protruding tongue can be a sign of down syndrome. Soft and hard palate should be intact. Gums and tongue should be pink. Gray-white patches on the tongue and gums can indicate thrush, a fungal infection caused by Candida albicans, sometimes acquired from the mother's vaginal secretions.

Neck: Neck should be short, thick,, surrounded by skin folds, and exhibit no webbing. Neck should move freely from side to side and up and down. Absence of head control can indicate prematurity or down syndrome.

Chest: Chest should be barrel-shaped. Respirations are primarily diaphragmatic. Clavicles should be intact. Absence of retractions. Nipples should be prominent, well formed, and symmetrical. Breast nodules can be 3 to 10 mm.

Abdomen: Umbilical cord should be odorless and exhibit no intestinal structures. Abdomen should be round, dome-shaped, and nondistended. Bowel sounds should be present 1 to 2 hours following birth.

Anogenital: Anus should be present, patent, and not covered by a membrane. Meconium should be passed within 24 hours to 48 hours after birth. Genitalia of a male newborn should include rugae on the scrotum. Testes should be present in the scrotum. Male urinary meatus is located at penile tip. Genitalia of a female should include labia majora covering the labia minora and clitoris, and are usually edematous. Vaginal blood-tinged discharge can occur in female

newborns, which is caused by maternal pregnancy hormones. This is an expected finding. A hymenal tag should be present. Urine should be passed within 24 hours after birth. Uric acid crystals will produce a rust color in the urine the first couple days of life.

Extremities: Assess for full range, symmetry of motion, and spontaneous movements. Extremities should be flexed. Assess for bowed legs and flat feet, which should be present because lateral muscles are more developed than the medial muscles. No click should be heard when abducting the hips. Gluteal folds should be symmetrical. Soles should well-lined over two-thirds of the feet. Nail beds should be pink, and no extra digits are present.

Spine: Spine should be straight, flat, midline and easily flexed.

Reflexes:

Sucking & rooting reflex: Elicit by stroking the cheek or edge of mouth. Newborn turns the head toward the side that is touched and starts to suck. Usually disappears after 3 to 4 months but can persist up to one year.

Palmar grasp: Elicit by placing examiner's finger in palm of newborn's hand. The newborn's fingers curl around the examiner's fingers. Lessens by 3 to 4 months.

Plantar grasp: Elicit by placing examiner's finger at base of newborn's toes. The newborn responds by curling toes downward. Birth to 8 months.

Moro reflex: Elicit by allowing the head and trunk of the newborn a semi-sitting position to fall backward to an angle of at least 30 degrees. The newborn will symmetrically extend and then abduct the arms at the elbows and fingers spread to form a "c". Birth to 6 months.

Tonic neck reflex (fencer position): With newborn in supine, neutral position, examiner turns newborn's head quickly to one side. The newborn's arm and leg on that side extend and opposing arm an leg flex. Birth to 3 to 4 months.

Babinski reflex: Elicit by stroking outer edge of sole of the foot, moving up toward toes. Toes will fan upward and out. Birth to 1 year.

Stepping: Elicit by holding the newborn upright with feet touching a flat surface. The newborn responds with stepping movements. Birth to 4 weeks.

Senses:

Vision: The newborn should be able to focus on objects 8 to 12 inches away from face. This is approximately the distance from the mother's face when the newborn is breast feeding. The eyes are sensitive to light, so newborns [refer dim lighting. Pupils are reactive to light, and the blink reflex is easily stimulated. The newborn can track high-contrast objects and prefers bright colors and patterns. Term newborns can see objects as far away as 2.5 feet. Within 2 to 3 months, they can discriminate colors.

Hearing: Hearing is similar to that of an adult once the amniotic fluid drains from the ears. Newborns exhibit selective listening to familiar voices and rhythms of intrauterine life. The newborn turns toward the general direction of a sound.

Touch: Newborns should respond to tactile messages of pain and touch. The mouth is the area most sensitive to touch in the newborn.

Taste: Newborns can taste and prefer sweet to salty, sour, or bitter.

Smell: Newborns have a highly developed sense of smell, prefer sweet smells, and can recognize the mother's smell.

Habitation: There is a protective mechanism whereby the newborn becomes accustomed to environmental stimuli. Response to a constant or repetitive stimulus is decreased. This allows the newborn to select stimuli that promotes continued learning, avoiding overload.

Cleft lip and palate: This is an abnormal occurrence where the oral palate or the lip or both do not come together in utero and thus causing a cleft. This requires careful monitoring due to feeding issues, aspiration, and requires surgical intervention.

9. How is a newborns blood type determined?

Cord blood is collected at birth. Laboratory tests are conducted to determine ABO blood type and Rh status if the mother's blood type is "O" or she is Rh-negative. A CBC can be done by a capillary stick to evaluate for anemia, polycythemia, infection, or clotting problems. Blood glucose is done to evaluate for hypoglycemia.

10. What are the normal Expected laboratory values for a newborn?

HGB	14 to 24 g/dL
Platelets	150,000 to 300,000/mm3
HCt	44 to 64%
Glucose	40 to 60 mg/dL
RBC count	4.8 to 7.1
Bilirubin **24 hr** **48 hr** **3-5 days**	 2 to 6 mg/dL 6 to 7 mg/dL 4 to 6 mg/dL
Leukocytes	9,000 to 30,000/mm3

11. What are the 3 primary complications noted with newborns? What are the nursing interventions for each of these complications?

- ➔ Airway obstruction related to mucus
  - ◆ Mouth and nose are suctioned with a bulb syringe. Gentle percussion over the chest can help loosen secretions
- ➔ Hypothermia
  - ◆ Monitor axillary temperature. Healthy newborn skin temperature is approximately 36.5 to 37 C (97.7 to 98.6 F)
  - ◆ If temperature is unstable, place the newborn in a radiant warmer, and maintain skin temperature at approximately 36.5 C (97.7F). Ideal method for promoting warmth and maintaining neonate's body temperature for a stable newborn's early skin-to-skin contact with mom. If the infant does not remain skin-to-skin with mom during the first 1 to 2 hours after birth, the nurse places the thoroughly dried infant under the radiant warmer or in a warm incubator until body temperature stabilizes.
  - ◆ Assess axillary temperature every hour until stable
  - ◆ All exams and assessments should be performed under a radiant warmer or during skin-to-skin contact with the mother.
- ➔ Inadequate oxygen supply
  - ◆ Monitor respirations and skin color for cyanosis.
  - ◆ Stabilize the body temperature or clear airway as indicated, administer oxygen, and if needed, prepare for resuscitation.

RKC Ch 18; ATI Ch 24

1. Summarize the physical assessment of a newborn

- ➔ Vital signs should be checked on admission/birth and every 30 min x 2, every 1 hour x2, and then every 8 hours (Note that protocols vary e.g. OSF does VS q 4 hours after the first 4 hours of initial recovery.)
- ➔ Weight should be checked daily at the same time, using the same scale
- ➔ Inspect the umbilical cord. Observe for any bleeding from the cord, and ensure that the cord is clamped securely to prevent hemorrhage
- ➔ In the first 6 to 8 hours of life as body systems stabilize and pass through periods of adjustment, observe for periods of reactivity:
  - ◆ First period of reactivity: The newborn is alert, exhibits exploring activity, makes sucking sounds, and has a rapid heart rate and respiratory rate. Heart rate can be as high as 160 to 180/min, but will stabilize at a baseline of 100 to 120/min during period that lasts 30 min after birth
  - ◆ Period of relative inactivity: The newborn will become quiet and begin to rest and sleep. The heart rate and respirations will decrease, and this period will last from 60 to 100 min after birth
  - ◆ Second period of reactivity: The newborn reawakens, becomes responsive again, and often gags and chokes on mucus that has accumulated in his mouth. This period usually occurs 2 to 8 hours after birth and can last 10 minutes to several hours.
- ➔ Using the facility's preferred pain assessment tool, conduct a pain assessment on the newborn every 8 to 12 hours following painful procedures

How do you calculate weight loss? Subtract the current weight from the birth weight in grams. The divide that result by the birth weight and multiply times 100 to get the percent/

2. When and how is the Neonatal screening (sometimes called metabolic screening) done? What is the importance of this test? Describe the collection sample procedure.

- ➔ Newborn genetic screening is mandated in all states. A capillary heel stick should be done 24 hours following birth. For results to be accurate, the newborn must have received formula or breast milk for at least 24 hours. If the newborn is discharged before 24 hours of age, the test should be repeated in 1 to 2 weeks
- ➔ All states require testing for phenylketonuria (PKU). PKU is a defect in protein metabolism in which the accumulation of the amino acid phenylalanine can result in mental retardation. (Treatment in the first 2 months of life can prevent mental retardation)

3. What are the signs of respiratory distress in the newborn?

- ➔ Bradypnea: respirations less than or equal to 30/min
- ➔ Tachypnea: respirations greater than or equal to 60/min
- ➔ Abnormal breath sounds: expiratory grunting, crackles, and wheezes
- ➔ **Respiratory distress**: nasal flaring, retractions, grunting, gasping, and labored breathing

4. Summarize the interventions for stabilization and resuscitation of airway.

- ➔ The newborn is able to clear most secretions in air passages by the cough reflex. Routine suctioning of the mouth, then the nasal passages with a bulb syringe, is done to remove excess mucus in the respiratory tract
- ➔ Newborns delivered by c-section are more susceptible to fluid remaining in the lungs than newborns who were delivered vaginally. This can lead to respiratory distress immediately after birth.!!!!!!!
- ➔ If bulb suctioning is unsuccessful, mechanical suction and/or back blows and chest trusts can be used, as well as the institution of emergency procedures
- ➔ The bulb syringe should be kept with the newborn, and the newborn's family should be instructed on its use. Family members should be asked to perform a demonstration to show that they understand bulb syringe techniques

- Compress bulb before insertion into one side of the mouth
- Avoid center of the mouth to prevent stimulating the gag reflex
- Aspirate mouth first, one nostril, then second nostril

5. Apply the nursing process to thermoregulation components and list appropriate nursing interventions

- The newborn keeps warm by metabolizing brown fat, which is unique to newborns, but only within a very narrow temperature range. Becoming chilled (cold stress) can increase the newborn's oxygen demands and rapidly use up brown fat reserves. Therefore, monitoring temperature regulation is important
- Monitor for hypothermia in the newborn
  - Axillary temperature of less than 36.5 C (97.7 F)
  - Cyanosis
  - Increased respiratory rate
- **Conduction**: Loss of body heat resulting from direct contact with a cooler surface. Preheat a radiant warmer, warm a stethoscope and other instruments, and pad a scale before weighing the newborn. The newborn should be placed directly on the mother's chest covered with a warm blanket
- **Convection**: Flow of heat from the body surface to cooler environmental air. Place the bassinet out of the direct line of a fan or air conditioning vent, swaddle the newborn in a blanket, and keep the head covered. Any procedure done with the newborn uncovered should be performed under a radiant heat source. Keep ambient temperature of the nursery or mother's room at 22 to 26 C (72 to 78 F).
- **Evaporation**: Loss of heat as surface liquid is converted to vapor. Gently rub the newborn dry with a warm sterile blanket (adhering to standard precautions) immediately after delivery. If thermoregulation is unstable, postpone the initial bath until the newborn's skin temperature is 36.5 C (97.7 F). When bathing, expose only one body part at a time, washing, and drying thoroughly.
- **Radiation**: Loss of heat from the body surface to a cooler solid surface that is close to, but not direct contact. Keep the newborn and examining tables away from windows and air conditioners.

6. What would you teach parents regarding:

Bathing: Bathing can begin once the newborn's temp has stabilized to at least 36.5 C (97.7 F). According to the textbook, a complete sponge bath should be given within the first 1 to 2 hours after birth under a radiant heat source to prevent heat loss. Newer studies indicate that it is better to wait to do the first bath to allow the infant to stabilize and to not increase the risk of cold stress. If necessary, the first bath will be postponed until thermoregulation stabilizes. Gloves should be worn until the newborn's first bath to avoid exposure to body secretions!!!!

Diaper changes: Before diapering, make sure all supplies are within reach, including clean diaper, cleaning agent or wipes and ointment. Lay the newborn on a changing table and remove the dirty diaper. Use water and mild soap or wipes to gently wipe the genital area clean; wipe from front to back for girls to avoid UTIs. Wash your hands thoroughly before and after changing diapers and wear gloves.

Feeding: Breastfeeding is initiated ASAP after birth as part of baby-friendly initiatives. Formula feeding usually is started at about 2 to 4 hours of age. A few sips of sterile water can be given to assess sucking and swallowing reflexes and ensure that there are no anomalies, such as a tracheoesophageal fistula, prior to initiating formula. The newborn is fed on demand, which is

normally every 3o to 4 hours for bottle fed newborns and more frequently for breastfed newborns. Monitor and document feedings per facility protocol.

Newborn Sleep: Sleep-wake states are variations of consciousness in the newborn consisting of six states along a continuum comprised of deep sleep, light sleep, drowsy, quiet alert, active alert, and crying. Newborns sleep approximately 16 to 19 hours/day with periods of wakefulness gradually increasing. Newborns are positioned supine, "safe sleep," to decrease incidence of sudden infant death syndrome (SIDS). No bumper pads, loose linens, or toys should be placed int the bassinet. Mothers should sleep in close proximity but not in a shared space. Higher incidence rates are noted for SIDS and suffocation with bed sharing/co-sleeping. Educate parents about the need for immunizations as a measure to prevent SIDS.

Elimination: Newborns should void once within 24 hours of birth. They should void 6 to 8 times per 24 hours after day 4. Meconium should be passed within the first 24 hours to 48 hours after birth. The newborn will then continue to pass stool 3 to 4 times a day depending on whether he is being breast- or bottle-fed. The stools of newborns who are breastfed can appear yellow and seedy. They should have at least 3 stools per day for the first month. These stools are lighter in color and looser than the stools of newborns who are formula-fed. Keep perineal area clean and dry. The ammonia in urine is irritating to the skin and can cause diaper rash. After each diaper change, cleanse the perineal area with clear water or water with mild soap. Diaper wipes with alcohol should be avoided. Pat dry, and apply petroleum jelly with vitamins A & D ointment or zinc oxide, depending on facility protocol.

Infection control: Provide individual bassinets equipped with a thermometer, diapers, T-shirts, and bathing supplies. According to your textbook, all personnel who care for a newborn should scrub with antimicrobial soap from elbows to fingertips before entering the nursery. This is still true in some facilities but not all. In between care of the newborn, the nurse should follow facility hygiene protocols. Cover gowns or special uniforms are used to avoid direct contact with clothes in some facilities.

Umbilical cord care: Cord clamp stays in place 24 to 48 hours. Assess stump and base of cord for erythema, edema, and drainage with each diaper change. The newborn's diaper should be folded down and away from the umbilical stump. Bathing infant by submerging in water should not occur until the cord has fallen off. Most cords fall off within the 10 to 14 days.

7. Medications to know:

Medication	**Indications (why is this needed for THIS patient?)**	**Nursing Implications (what are you watching for?)**	**Dose**
Erythromycin	Prophylactic eye care is the mandatory installation of antibiotic ointment into the eyes to prevent ophthalmia neonatorum.	A possible side effect is chemical conjunctivitis, causing redness, swelling, drainage, and temporarily blurred vision for 24 to 48 hours. Reassure parents that this will resolve on its own.	Apply a 1 to 2 cm ribbon of ointment to the lower conjunctival sac of each eye, starting from the inner canthus and moving outward.

Vitamin K (Aquamephyton)	Administered to prevent hemorrhagic disorders. Vitamin K is not produced in the GI tract of the newborn until around day 7. Vitamin K is produced in the colon by bacteria that forms once formula or breast milk is introduced into the gut of the newborn.	Give as an IM injection at a 90-degree angle into the outer middle third of the vastus lateralis muscle. Assess for bleeding at the injection site.	Administer 0.5 to 1 mg IM into the vastus lateralis within 1 hour following birth.
Hepatitis B vaccine	Provides protection against hepatitis B.	Informed consent must be obtained. For newborns born to healthy women, recommended dosage schedule is at birth, 1 month, and 6 months. For mothers infected with hepatitis B, hepatitis B immunoglobulin and the hepatitis B vaccine is to give within 12 hours of birth. The hepatitis B vaccine is give alone at 1 month, 2 months, and 12 months.	For newborns born to healthy women, recommended dosage schedule is at birth, 1 month, and 6 months.

8. Why is it important to monitor newborns for cold stress? What signs and symptoms are noted with this? What treatment is used?

➔ Ineffective thermoregulation can lead to hypoxia, acidosis, and hypoglycemia. Newborns who have respiratory distress are at a higher risk for hypothermia

- Monitor for manifestations of cold stress (cyanotic trunk, depressed respirations)
- The newborn should be warmed slowly over a period of 2 to 4 hours. Correct hypoxia by administering oxygen. Correct acidosis and hypoglycemia.

9. Why is it important to monitor newborns for hypoglycemia? What are the signs and symptoms? What is the treatment?

➔ Frequently occurs in the first few hours of life secondary to the use of energy to establish respirations and maintain body heat

- Newborns of mothers who have DM, are small or large for gestational age, are less than 37 weeks of gestation, or are greater than 42 weeks of gestation, are at risk for hypoglycemia and should have blood glucose monitored within the first 2 hours of life
- Monitor for jitteriness: twitching, a weak, high-pitched cry, irregular respiratory effort, cyanosis, lethargy, eye rolling, seizures, and a blood glucose level less than 40 mg/dL by heel stick
- Have the mother breastfeed immediately or give donor breast milk or formula to elevate blood glucose levels. Brain damage can result if brain cells are depleted of glucose.

ATI Ch 25 ;Breatfeeding powerpoint

1. Describe the key nutritional needs of the newborn.

- Normal newborn weight loss immediately after birth and subsequent weight gain should be as follows:
  - Loss of 5% to 10% after birth (regain 10 to 14 days after birth)
  - Gain of 110 to 200 g/week for first 3 months
- Healthy newborns need a fluid intake of 100 to 140 mL/kg/24 hours. Newborns do not need to be given water because they receive sufficient water from breast milk or formula
- Adequate caloric intake is essential to provide energy for growth, digestion, metabolic needs, and activity. For the first 3 months, the newborn requires 110 kcal/kg/day. From 3 to 6 months, the requirement decreases to 100 kcal/kg/day. Both breast milk and formula provide 20 kcal/oz.
- Carbohydrates should make up 40% to 50% of the newborn's total caloric intake. The most abundant carbohydrate in breast milk or formula is lactose.
- At least 15% of calories must come from fat. The fat in breast milk is easier to digest than fat in cow's milk
- For adequate growth and development, a newborn must receive 2.25 to 4 g/kg/day of protein
- Some texts and some Pediatricians recommend that all infants who are breastfed or partially breastfed should receive 400 IU of vitamin D daily beginning in the first few days of life. This is not universally accepted except for those infants born prematurely. Infant formula has vitamins added, but vitamin D supplements also are recommended. Mothers who are breastfeeding and are vegetarians who are exclude meat, fish, and dairy products should provide vitamin b12 supplementation to their newborns

2. According to the American Academy of Pediatrics, how often should newborns breastfeed? What infant specific benefits have been found with breastfeeding?

- Breastfeeding is recommended exclusively for the first 6 months of age by the AA of P. Newborns should be breastfed every 2 to 3 hours during the day and at least every 3 hours during the day and at least every 4 hours during the night until the newborn is feeding well and gaining weight adequately. Breastfeeding should occur 8 to 12 times within a 24 hour period. Then, a feed-on-demand schedule can be followed.

3. List 4 interventions to promote successful breastfeeding.

- encourage appropriate latch-on from the beginning
- expose nipples to air between feedings
- Lanolin is not recommended as it once was. Coconut oil is safe to use.
- use aloe vera or vitamin E to help heal sore nipples
- apply warm compresses or encourage the mother to take a warm shower prior to having the baby latch on

➔ feed on cue, not on a schedule!!!

4.Breastmilk can be stored in each of the following for how long?
ATI states 8 hr at room temperature under very clean conditions
ATI states 8 days refrigerated in steriled bottles.
6 months in frozen sterile containers in the freezer compartment of a refrigerator
12 months in a deep freezer because it is kept frozen more solidly.

5. How often should bottle-fed babies be feeding?
➔ newborns may only take a half-ounce to one ounce per feeding initially
➔ work up to 2-3 ounces in the first few days
➔ need to feed about 6-10 times per day
➔ by 6 months they will feed 4-5 times per day and take 6-8 ounces per feeding

6. What should be assessed when determining proper nutrition for the newborn?
➔ healthy eating habits should be developed during infancy
➔ infants and children learn about eating through watching others
➔ do not let infants eat whatever they want
➔ do not coerce infant into eating all that is provided; sets child up for overeating in the future

7. What cues are exhibited by a newborn to show feeding readiness?
➔ feed on cue (when the baby displays signs of hunger)
- ◆ sucking motions (rooting)
- ◆ sucking on hands
- ◆ putting fist to the chin
- ◆ crying is a late sign

8. What techniques can you teach parents in order to wake a sleepy baby to feed? What about a fussy baby who needs comforted?
sleepy baby: stroke the feet, undress, and rub the infant's head
fussy baby: check that all infant's basic needs are met, reduce stimulation, carry the infant, motion with infant swings or car ride, vibration, white noise, or swaddling, pacifiers

9. What is failure to thrive? -- p. 1244
Failure To Thrive: term used to describe inadequate growth in infants and children. The child fails to demonstrate appropriate weight gain over a prolonged period of time.
➔ RN Interventions:
- ◆ observe parent-child interactions, especially during feedings
- ◆ develop an appropriate feeding schedule
- ◆ provide feedings as prescribed for proper weight gain
- ◆ weigh child daily and maintain strict records of intake and output
- ◆ educate parents about proper feeding techniques and volumes
- ◆ provide extensive support to alleviate parental anxiety relate to child's inability to gain weight

ATI Ch 26
Since the majority of OB is about education/teaching, you are responsible for all information in this chapter, as you will use it clinically and during theory/exam.

RKC Ch 23 & 24; ATI Ch 27

1. Describe what the neonate going through substance withdraw would look like. -- Ch 24

W - Wakefulness: sleep duration less than 3 hr after feeding
I - Irritability
T - Temperature variation, Tachycardia, Tremors
H - Hyperactivity, High-pitched persistent cry, Hyperreflexia, & Hypertonus
D - Diarrhea, Diaphoresis, Disorganized suck
R - Respiratory distress, Rub marks, Rhinorrhea
A - Apneic attacks, Autonomic dysfunction
W - Weight loss or failure to gain weight
A - Alkalosis (respiratory)
L - Lacrimation

2. How can infants be tested for maternal drug use and what nursing care should be implemented for infants who are withdrawing? -- Ch 24

Toxicology screening of newborn's blood, urine, & meconium identifies substances the newborn has been exposed to
Urine drug screening identifies only recent substance exposure

Goals:

- ➔ provide comfort while relieving symptoms
  - ◆ swaddling
  - ◆ low lighting
  - ◆ gentle handling
  - ◆ quiet environment with minimal stimulation
  - ◆ pacifiers for "self-soothing"
  - ◆ frequent small feedings
  - ◆ vertical rocking during infant disorganization periods
- ➔ improve feeding and weight gain
  - ◆ supplemented with high-calorie formula
  - ◆ use small amounts & position newborn upright
  - ◆ monitor weight daily
  - ◆ mom cannot breastfeed if still using drugs (needs a negative toxicology)
  - ◆ assess fluid & electrolyte & acid-base status
  - ◆ assess frequency & characteristics of bowel movements
- ➔ prevent seizures
- ➔ promote mother-newborn interactions
- ➔ reduce the incidence of newborn mortality & abnormal development

3. What medications are often used to help with withdrawal symptoms? -- Ch 24

Medication Therapy is warranted if the newborn has seizures, diarrhea, and vomiting resulting in excessive weight loss and dehydration, poor feeding, inability to sleep, & fever unrelated to infection

Examples: opioid (morphine or methadone) and phenobarbital if the opiate does not adequately control symptoms

4. Hypoglycemia in the newborn is defined as: -- Ch 24
Blood Glucose level below 40 mg/dL

5. What does a hypoglycemic infant look like? How would they be treated? -- Ch 24
Characteristics of Infants with Diabetic Mothers:
➔ LGA or SGA
full rosy cheeks with a ruddy skin color

➔ short neck (some describe "no neck" appearance)
➔ buffalo hump over nape of neck
➔ massive shoulders with a full intrascapular area
➔ distended upper abdomen due to organ overgrowth
➔ excessive subcutaneous fat tissue, producing fat extremities

Signs & Symptoms of Infants with Hypoglycemia:
➔ blood glucose below 40 mg/dL
➔ listlessness
➔ hypotonia
➔ apathy
➔ poor feeding
➔ high-pitches or weak cry
➔ apneic episodes with a drop in O2 saturation

6. Respiratory Distress Syndrome (RDS) is a result of surfactant deficiency in the lungs causing poor gas exchange and ventilatory failure.

What is surfactant? Phospholipid: assists in alveoli expansion

What complications arise from RDS? Pneumothorax, pneumomediastinum, retinopathy, bronchopulmonary dysplasia, infection, intraventricular hemorrhage.

7. What risk factors are included in the assessment for RDS?

Preterm, perinatal asphyxia, maternal DM, premature rupture of membranes, maternal barbituates/narcotic use, maternal hypotension, cesarean birth, hydrops fetalis, 3rd trimester bleeding, hypovolemia, white male

8. What does an RDS infant look like?

Tachypnea, nasal flaring, expiratory grunting, retractions, labored breathing with prolonged expirations, fine crackles, cyanosis, unresponsiveness, flaccidity, apnea, decreased breath sounds

9. Describe the presentation and care of the newborn.

Suction mouth, trachea & nose PRN; maintain temp; provide mouth/skin care; correct respiratory acidosis or metabolic acidosis; maintain O2 (prevent lactic acidosis); monitor pulse ox; provide IV nutrition as prescribed; monitor labs, I & O, weight; decrease stimuli

10. SGA vs LGA, compare and contrast.

	SGA	LGA

Risk factors:	HTN, gestational HTN, multifetal preg; frequent pregnancies in a short time, lack of prenatal care, adolescent pregnancy, maternal substance use, maternal smoking, Abnormalities of the uterus Cervical incompetence Placenta previa Preterm labor Premature rupture of membranes	Maternal DM, obesity, Multiparous Post maturity Fetal cardiovascular disorder of transposition of the great vessels Genetic factors
Findings	Ballard scale <37 Periodic breathing with 5-10 sec pause, 10-15 sec rapid Increased resp effort/distress: nasal flaring, retractions, grunting, tachypnea Apnea ≥ 20 sec Decreased birth weight Decrease subcutaneous fat tissue Large head for body, small fontanels Wrinkled features, lots of lanugo, few to no creases on soles of feet Skull & rib cage feel soft Closed eyes if 22-24 wks gestation Weak grasp reflex Uncoordinated/weak swallow, weak to no gag, such, cough reflex Hypotonic muscles, decreased , week cry >72 hours Lethargy, tachypnea, poor wt gain	Large head Plump full face (increase subq fat) Hypoxia-tachypnea, retractions, cyanosis, nasal flaring, & grunting Birth trauma Sluggishness, hypotonia muscles & hypoactivity Birth trauma Tremors from hypercalcemia Hypoglycemia Resp distress from immature lungs or meconium aspiration ICP findings: dilated pupils, vomiting, bulging fontanels, high pitched cry
Care considerations	Rapid initial assessment Assess VS, I & O, daily weight, skin color & temp. Assess ability to feed, gag reflex, parenteral/enteral nutrition Minimal stimulation Protect against infection,	Before birth: prepare for an assisted/cesarean delivery Possible use of McRoberts maneuvers-pressure to suprapubic to aid in anterior shoulder delivery Assess for birth trauma

	dehydration, over hydration	After birth- early/freq Glucose testing (heel sticks), initiate feedings/IV therapy, thermoregulation, identify/treat birth injuries.

11. Discuss the variations between physiologic and pathologic jaundice.

Physiologic—benign occurs after 24 hours

- Pathologic—underlying disease --note if it occurs before 24 hours ABO incompatibility. Lab test: Direct combs—
  A direct Coombs test (direct antiglobulin test [DAT]) may also be used to help diagnose hemolytic disease of the newborn (HDN) due to an incompatibility between the blood types of a mother and baby.

How are they treated? phototherapy –See text for safety measures when infant under phototherapy

a. Must provide for warmth since the infant is dressed only in a diaper with no blankets. This will decrease fluid loss and hypoglycemia with phototherapy.
b. Eyes must be covered to protect from ultraviolet light
c. Infant may be taken out to feed at regular intervalsas fluid intake needs to increase. (if premature and needs to remain in isolette, then feeding is done via NG tube or bottle of formula or expressed breast milk with infant in isolette in order to maintain warmth.)
d. Assess skin frequently since the ultraviolet lights are warm.

12. Congenital anomalies: focus on patent ductus arteriosus, Tetralogy of Fallot, and Down Syndrome.

Patent ductus arteriosus-non cyanotic heart defect where duct between pulmonary artery and aorta fails to close—not uncommon and often closes on own within a few days.

Tetrology of Fallot-Cyanotic heart defect . Ventricular septal defect with aorta positioned over, stenosis of the pulmonary valve, hypertrophy of the right ventricle. Severe congenital heart defect.

Down Syndrome—Trisomy 21

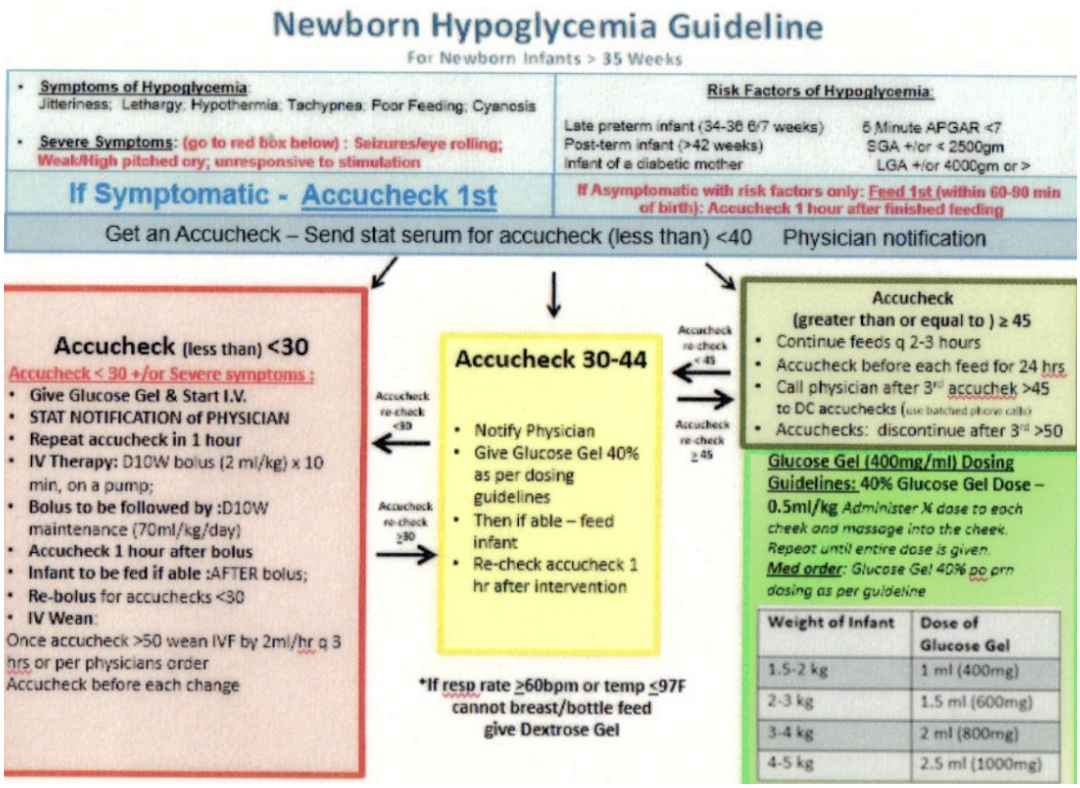
➔ Simian crease (across palm of the hand)
➔ short neck (some describe “no neck” appearance)
➔ buffalo hump over nape of neck
➔ massive shoulders with a full intrascapular area

➔ distended upper abdomen due to organ overgrowth
➔ excessive subcutaneous fat tissue, producing fat extremities

Signs & Symptoms of Infants with Hypoglycemia:
➔ blood glucose below 40 mg/dL
➔ listlessness
➔ hypotonia
➔ apathy
➔ poor feeding
➔ high-pitches or weak cry

➔ apneic episodes with a drop in O2 saturation
➔ cyanosis
➔ temperature instability
➔ pallor & sweating
➔ tremors
➔ irritability
➔ seizures

Treatment:
➔ early oral feedings
➔ IV glucose infusions



6. RDS is a result of surfactant deficiency in the lungs causing poor gas exchange and ventilatory failure. What is surfactant? What complications arise from RDS? -- Ch 24

RDS: a breathing disorder resulting from **lung immaturity** and **lack of alveolar surfactant,** which keeps the air sacs in the lungs from collapsing and allows them to inflate easily.

Surfactant: complex mixture of phospholipids and proteins that adheres to the alveolar surface of the lungs

Complications: stiff lungs and alveoli that tend to collapse which leads to atelectasis, work of breathing is increased, hypoxemia & acidemia may result which leads to vasoconstriction of the pulmonary vasculature, right-to-left shunting occurs & alveolar capillary circulation is limited; With disease progression - fluid & fibrin leak from pulmonary capillaries causing hyaline membranes to form in bronchioles & alveolar ducts & alveoli (this produces a glassy appearance in the lung membranes which can be seen on x-rays) this decreases total surface area for gas exchange, end result is hypoxemia, acidemia, and worsening respiratory distress

7. What risk factors are included in the assessment for RDS? -- Ch 24

- ➔ Premature birth -- most common risk factor
- ➔ Cesarean birth in absence of preceding labor (related to lack of thoracic squeezing
- ➔ Male gender
- ➔ Previous birth of infant with RDS
- ➔ Perinatal Asphyxia
- ➔ Cold stress
- ➔ Maternal diabetes (produces high levels of insulin which inhibit surfactant production)

8. What does a respiratory distress syndrome (RDS) infant look like? -- Ch 24

- ➔ signs are demonstrated at birth or within a few hours of birth
- ➔ expiratory grunting
- ➔ shallow breathing
- ➔ nasal flaring
- ➔ chest wall retractions
- ➔ seesaw respirations
- ➔ generalized cyanosis
- ➔ tachycardia
- ➔ fine inspiratory crackles
- ➔ tachypnea

Diagnostics:

- ➔ lung ultrasound
- ➔ x-ray findings (hypoaeration, underexpansion, & **“ground glass” pattern**)
- ➔ ABGs (hypoxemia & acidosis)

9. Describe the order of interventions during the immediate period after the infant is born. Presentation & Care of the newborn. -- Ch. 18

- ➔ Maintaining airway patency -- immediately after birth the newborn is suctioned to remove fluids & mucous from the mouth and nose
- ➔ Initial newborn assessment -- RAPP assessment (Respiratory Activity, Perfusion, Position)
- ➔ APGAR score; done 1 min & 5 min after birth (10 min done if 5 min score is < 7)
- ➔ Vital Signs -- usually assessed at the same time as the APGAR

- ➔ Length & Weight
- ➔ Eye Ointment/ Drops used as prophylaxis should be instilled within the first 1-2 hours after birth
- ➔ Gestational Age Assessment (Ballard Scale) -- done during first 2 hours after birth
- ➔ Second assessment performed within the first 2-4 hours
- ➔ Third assessment completed before discharge

10. SGA vs LGA, compare and contrast. -- Chapter 23

	SGA	**LGA** **weight > 4,000 g (> 9lb)**
Risk factors:	maternal causes: chronic htn, diabetes, smoking, preeclampsia, substance abuse Placental factors: decreased placental weight, placenta previa, placental insufficiency Fetal factors: trisomy 13, 18 & 21, turner syndrome, congenital anomalies, multiple fetal gestation	maternal causes: diabetes, glucose intolerance, multiparity, prior history of macrosomic infant, postterm gestation, maernal obesity, paternal height, gestational wt gain, male fetus, & genetics
Findings:	Head disproportionately large compared with rest of body Wasted appearance of extremities Reduced subcutaneous fat stores Jittery 2ndary to hypoglycemia Decreased amount of breast tissue Scaphoid abdomen (sunken appearance) Temperature instability Wide skull sutures Poor muscle tone over buttocks and cheeks Loose & dry skin that appears oversized Thin umbilical cord	large body and appears plump and full-faced increase in body size is proportional head circumference & body length are in the upper limits of intrauterine growth poor motor skills and difficulty in regulating behavioral states more difficult to arouse to a quiet alert state clinical signs: lethargy, apathy, drowsiness, irritability, tachypnea, weak cry, temperature instability, jitteriness, seizures, apnea, bradycardia, cyanosis, poor feeding, hypotonia, & coma.
Care considerations:	Provide anticipatory guidance to parents about any treatments and procedures that are being done Emphasize the need for close follow-up & careful monitoring of the infant's growth in length, weight, and head circumference and feeding patterns throughout the first yr of life	monitor for hypoglycemia (blood glucose below 40 mg/dL) observe for hyperbilirubinemia and polycythemia

	Frequent serial blood glucose measurements and vital signs Monitor for changes in respiratory status Maintain a thermal environment to prevent cold stress & acidosis Monitor feeding tolerance, sucking, & swallowing	

11. Discuss the variations between physiologic and pathologic jaundice. How are they treated? -- Chapter 24

Physiologic Jaundice: unconjugated hyperbilirubinemia that occurs after the first postnatal day and can last up to 1 week. May result from an increased bilirubin load because of relative polycythemia, a shortened RBC lifespan, immature hepatic uptake and conjugation process, and increased enterohepatic circulation.
Newborns with delayed passage of meconium are more likely to develop physiologic jaundice because meconium contains high levels of bilirubin.
Physiologic jaundice differs between breast-fed and bottle-fed newborns in relation to the onset of symptoms.
Breast-fed: peak bilirubin levels on the 4th day of life.
Bottle-fed: peak bilirubin levels on the 3rd day of life.

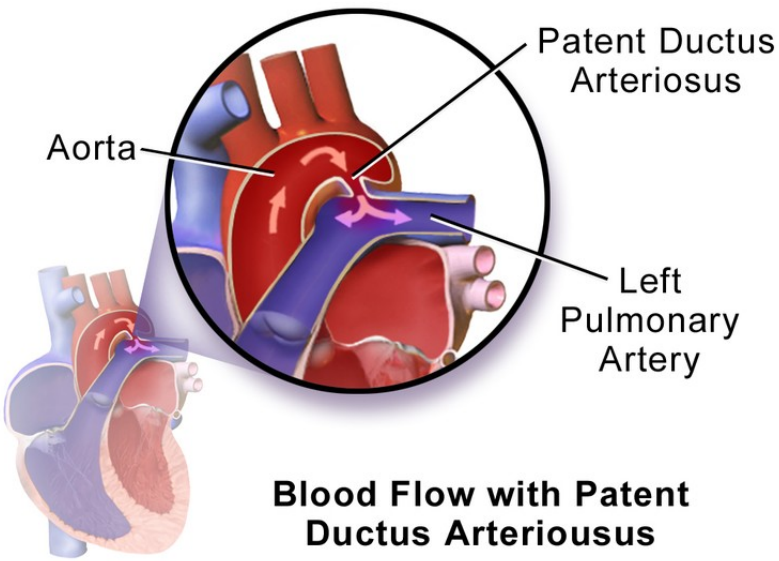
Pathologic Jaundice: manifested with the first 24 hours of life when total bilirubin levels increase by more than 5 mg/dL/day and the total serum bilirubin level is higher than 17 mg/dL in a full-term infant. This condition requires intervention. It's caused by conditions that alter the production, transport, uptake, metabolism, excretion, or reabsorption of bilirubin can cause pathologic jaundice in the newborn. These altered conditions can lead to high levels of unconjugated bilirubin, possibly reaching toxic levels and resulting in a severe condition called **kernicterus** or bilirubin encephalopathy.
Hyperbilirubinemia is a great concern because of the potential for brain injury.

Treatment:
Phototherapy: used, regardless of etiology, to convert unconjugated bilirubin to less toxic water-soluble form that can be excreted.
➔ monitor I&O and daily weights and check skin turgor

12. Congenital anomalies: Describe patent ductus arteriosus, Tetralogy of Fallot, and Down Syndrome. -- Chapter 24

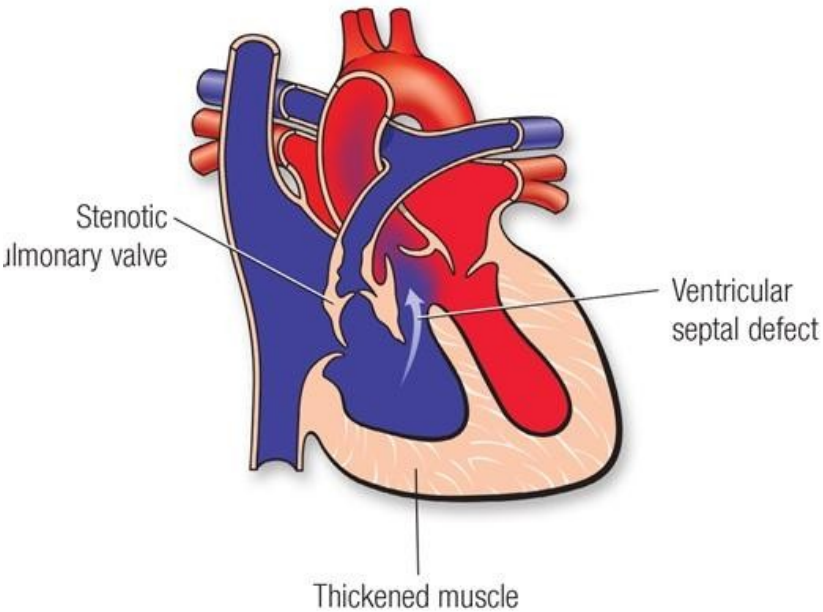
Disorder	Patho	Signs & Symptoms	Treatment	Complications	RN Interventions
Patent Ductus Arteriosus (PDA)	Failure of the ductus arteriosus to close within	• continuous machine-like hum due to	• Surgery - thoracoscopic repair	• increased resistance and stress to the	• Health Hx • Note frequent respiratory

	the first few weeks of life - which leads to continued blood flow from the lungs and left atria and ventricle to the aorta back to the pulmonary artery	turbulent blood flow • Fatigue • Feeding issues • lung congestion (Crackles) • Tachycardia • Tachypnea • Bounding peripheral pulses • Widened pulse pressure • Low diastolic BP (b/c blood flow is in wrong places)	• Nonsurgical - administration of indomethacin, or insertion of coils to occlude PDA during cardiac catheterizatio n • Meds: Indomethacin (prostaglandin inhibitor)	heart leads to HF over time • endocarditis • failure to thrive • lung infection	infections, fatigue, and poor growth • Auscultate lungs and heart, note rales with HF and machine-like murmur
Tetralogy of Fallot -Occurs in the womb; cyanotic heart defect -Can include 4 structural defects: ➔ Pulmonary Stenosis ➔ Septal Defect ➔ Right Ventricular Hypertrophy ➔ Aorta Displacement	-Pulmonic Valve Stenosis causes decreased pulmonary blood flow and extra resistance which causes hypertrophy -Aorta is displaced because it enlarges -Blood from the Right Ventricle moves to the Left Ventricle to the Aorta	◆ activity intolerance ◆ feeding difficulties ◆ slowed growth ◆ “Tet Spell” caused by increased activity • causes increased respiratory rate ◆ Hypoxia symptoms (i.e. fingernail clubbing)	IV Fluids (decreases R to L shunt) decrease systemic vascular resistance ◆ surgery ◆ prostaglandin E		◆ With the “Tet Spell” the patient needs to have Knee-to-Chest positioning (or a squatting position)



Blood Flow with Patent Ductus Arteriousus

Tetralogy of Fallot



Atrioventricular canal defect (atrioventricular septal defect [AVSD], AV canal, or endocardial cushion defect) - 45% of children with Down Syndrome have this defect

Maternal age can have an effect on increased risk of AV canal occurrence which may be related to increased risk of woman giving birth to child with Down Syndrome.
Down syndrome: occurs when an individual has a full or partial extra copy of chromosome 21. This additional genetic material alters the course of development and causes the characteristics associated with Down syndrome.
Common physical traits: are low muscle tone, small stature, an upward slant to the eyes, and a single deep crease across the center of the palm

- Each person with Down syndrome is a unique individual and may possess these characteristics to different degrees, or not at all.