



## Chapter 12

# The Term Newborn



## Adjustment to Life Outside the Uterus

- Adjustment is dependent upon
  - Genetic background
  - Health of the recent uterine environment
  - A safe delivery
  - Care during the first month of life
  - Gestational age of newborn will depend on variety of things as well as mother's conditions prior to pregnancy and during pregnancy. Mother's health influences fetus gestational age.

# Adjustment to Life Outside the Uterus

- Respirations stimulated due to chilling and chemical changes in the blood. The lungs take on the function of breathing oxygen and removing carbon dioxide resulting in decrease in oxygen and increase in carbon dioxide with lowering pH because of asphyxia that takes place in delivery
  - Sensory and physical stimuli
  - First breath opens alveoli
  - Independent air exchange begins
- Initiates cardiopulmonary interdependence





## Adjustment to Life Outside the Uterus


- Ability to metabolize food hampered by immaturity of digestive system (deficient in enzymes from pancreas and liver)
- Kidney's ability to concentrate urine and maintain fluid balance is limited due to decreased rate of glomerular flow and limited renal tubular reabsorption
- Neurological functions are primitive



## Phase 3: Care of the Newborn

- When observing the newborn, the nurse identifies expected normal findings as well as variations and deviations from normal, which must be reported to the health care provider.





## Nervous System: Reflexes

- Moves arms and legs vigorously but cannot control them
- Full-term infants are born with the following reflexes (which help keep them alive)
  - Blinking
  - Sneezing
  - Gagging
  - Sucking
  - Grasping
- They can also cry, swallow, and lift their head (slightly) when lying on their abdomen

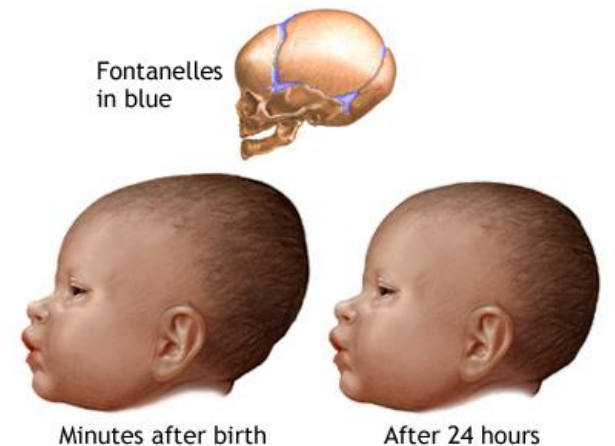
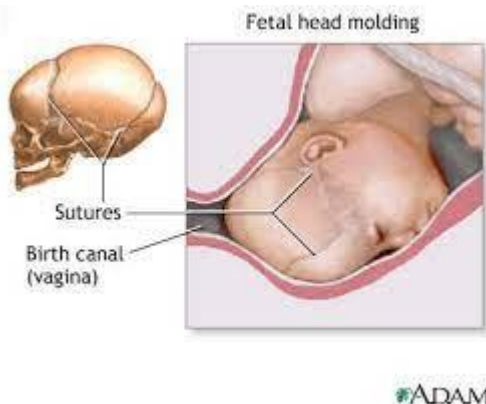
# Reflexes

- Be aware of the different Reflexes listed here and in Table 12-1
- Moro
- Rooting
- Tonic neck
- Dancing
- Babinski



# Head

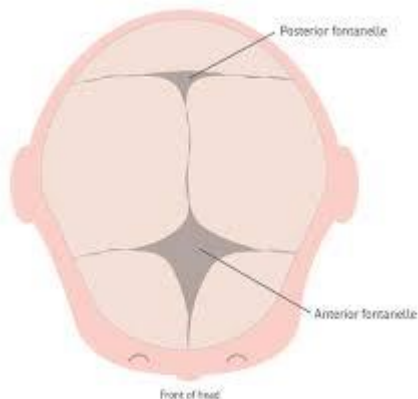
- Molding from delivery process
  - May have swelling of the soft tissues of the scalp, called *caput succedaneum*
  - May see a cephalohematoma—a collection of blood beneath the periosteum of the cranial bone
    - Does not cross the suture line



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# Head

- Fontanelles (soft spots) protect the head during delivery and allow further brain growth
  - Anterior-closes between 12-18 months-measures 3.6 to 6 cm; bulging or depressed
  - Posterior-usually closes by end of 2<sup>nd</sup> month





## Head

- Head circumference should be equal to but not more than 2 cm more than the chest circumference until child turns 2 years of age
- Go over skill on how to measure head and chest circumferences





# Eyes

- Eyes-
  - Can see and fixate on objects by contrast
  - Preference to human faces and moving objects
  - Visual stimulation-important they are attracted by sound and colors that contrast
  - Appear cross eyed
  - Color is blue or gray, permanent eye color between 6-12 months



## Ears

- Ears well-developed, but small
- Low set ears may indicate congenital abnormality-outer canthus of eye should be even with upper tip of pinna
- Hearing ability present at birth (sick or premature newborn may not respond to sounds)
- Normal drainage and sneezing occurs after birth to rid ear canals of amniotic fluid
- May react to sudden sounds by increased pulse or respiratory rate or startle reflex
- Responds to voices by decreasing motor activity, sucking activity, and turning head toward the sound-may respond to voices in 3 days especially mother's and other people consistently around child
- Hearing screening performed before discharge



## Visual Stimuli and Sensory Overload

- Can see and fixate on points of contrast
  - Toys with contrasting colors or those that make noise attract the newborn's attention
- Tears are absent until 1 to 3 months of age
- Sensory overload can occur if there is too much detrimental stimulation
- Important for the nurse to keep surrounding environment as calm and quiet as possible, no bright lighting or loud alarms



# Sleep

- 15 to 20 hours per day
- Phases of sleep-wake cycle
  - First reactive-first 30 min of life; best time to start the bonding process
  - Sleep
  - Second reactive
  - Stability-after 24 hrs sleep wake pattern more stable
- Specific pattern of reactivity that can influence the response to stimuli and bonding
  - Quiet sleep-does not move
  - Rapid eye movement (REM) sleep
  - Active alert-diffuse motor activity
  - Quiet alert-relaxed and quiet
  - Crying-vigorous movement
  - Transitional

- Produces catecholamines and cortisol
  - Heart and respiratory rates change
  - Blood pressure increases as does blood glucose levels
- Untreated pain can have long-term effects
  - Pain pathways and structures required for long-term memory are well developed by 24 weeks gestation
- Unrelieved pain can cause exhaustion, irritability, and delay the healing process



## Pain Assessment Tools

- COMFORT-7 pt scale-scored from 1-5/area; higher score indicates increased distress
- CRIES-10 pt scale; each area scored 0-2
- FLACC-each area scored 0-2
- PIPP-each area scored 0-3 and 21 being worst level
- NIPS-each area scored 0-2; score of 7 worst level of pain
- NPASS-scores in each category range from -2 to +2 with 0 indicating normal response



## Conditioned Responses

- A response of reflex that is learned over time
- Example is a hungry infant stops crying when it hears its mother's voice, even though food is not available
- Emotions particularly subject to this type of conditioning





# Neonatal Behavioral Assessment Scale

- Measures inherent neurological capacities and response to selected stimuli
- Areas tested include
  - Alertness
  - Response to visual and auditory stimuli
  - Motor coordination
  - Level of excitement
  - Organizational process in response to stress



## Respiratory System

- Once umbilical cord is clamped and cut
  - First breath helps to expand the collapsed lungs
  - Full expansion does not occur for several days
- Most critical period is the first hour of life
- Newborn should be positioned on the back or side to help maintain a patent airway
- If having some oropharyngeal mucus nurse might position infant to facilitate gravity or postural drainage



# Bulb Suctioning

- Nurse ensures patent airway is maintained through correct positioning of neonate (on its back or side) and removing any mucus from the mouth and nose with a bulb syringe
- Depress bulb first and then suction should be first mouth, throat and then nose





# Apgar Score

- Standardized method of evaluating newborn's condition immediately after delivery
- Five objective signs measured
  - Heart rate
  - Respiration
  - Muscle tone
  - Reflexes
  - Color





## Apgar Score

- Score is obtained at 1 and 5 minutes after birth
- Nurse monitors for respiratory distress as evidenced by
  - Rate and character of respirations
  - Color (cyanosis)
  - General behavior
- Sternal retractions must be reported immediately to the health care provider



# Circulatory System

- Has approximately 300 mL of circulating blood volume
- Neonatal circulation differs from fetal circulation-fetus most blood bypasses the lungs
- Dependent upon ducts within the heart to close at certain points in time, such as
  - Foramen ovale
  - Ductus arteriosus
- If the ducts fail to close when they are supposed to, the neonate may become cyanotic because the blood bypasses the lungs and does not pick up any oxygen
- Murmurs are functional or organic-majority not serious but will need to be checked



## Providing Warmth

- Unstable heat-regulating system
- Acrocyanosis is evident because of sluggish peripheral circulation
- Cannot adapt to change in temperatures easily
- Sweat glands do not function during neonatal period, so infant is at risk for developing elevated temperature if overdressed or placed in overheated environment



## Obtaining Temperature, Pulse Rate, and Respirations

- Temperature: can be taken rectally or in the axilla
- Pulse and respiratory rates: count before taking temperature as infant may cry when disturbed
- Assess temperature if signs of mottled trunk or any other assessments indicate body temperature is low
- The nurse should report
  - Temperature elevations  $>99.8^{\circ}\text{F}$  or  $<97.1^{\circ}\text{F}$  (97.8 to 98.9)
  - Pulse rates  $>160$  or  $<110$  beats/min (normal 110 to 160)
  - B/P avg is 80/46 mm Hg; depending on size cuff used could vary
  - Respirations  $>60$  or  $<30$  breaths/min
  - Noisy respirations
  - Nasal flaring or chest retraction

# Maintaining Body Temperature of the Newborn



Keep head covered. Head has large surface area as source of heat loss.

Prevent drafts to avoid heat loss by *convection*.

Do not place infant on cold surface to prevent heat loss by *conduction*.

Do not place bed near window to prevent heat loss by *radiation*.



Keep infant covered at all times. Expose small areas for diapering, etc.

Neonate has small amount of subcutaneous fat to conserve body heat.

Keep infant dry to prevent heat loss by *evaporation*.



# Musculoskeletal System

- Skeleton is flexible
- Position changed often due to easily molded
- Movements are random and uncoordinated
- Development of muscle control proceeds from head to foot and from the center of the body to the periphery
- Head and neck muscles are the first ones under control
- Checking scarf sign-infant's resistance when one elbow farther than the midline
- Bath time excellent time to assess condition and movements; also excellent stimulation for newborn



## Length and Weight

- Average length
    - 19 to 21.5 inches (46 to 56 cm)
  - Average weight
    - 6 to 9 pounds (2722 to 4082 g)
  - In the first 3 to 4 days after birth, the infant loses about 5% to 10% of its birth weight-preterm infants could lose up to 15%
    - May be a result of withdrawal from maternal hormones, fluid shifts, and the loss of feces and urine
    - Should normalize about 3-4 days; regain weight back by 10<sup>th</sup> day; gains about 4 to 7 ounces a week during first 6 months
- \*\*weighed at same time each day in same manner on same scale; weight recorded in kg in medical record



# Genitourinary System

- Kidneys not fully developed at birth
  - Glomeruli are small
  - Renal blood flow is about a third of an adult
  - Ability to handle a water load is reduced
  - Renal tubules are short and have limited capacity for reabsorbing important substances
  - Decreased ability to concentrate urine and cope with fluid imbalances
- Important for nurse to note first void- if first voiding does not occur in first 24 hrs; HCP is notified-accurate record of frequency
- Newborn has about 6 wet diapers per day
- Anuria, changes in color, any unusual findings such as not voiding after 8 hours which might indicate possible dehydration-HCP notified



## Male Genitalia

- Testes descend into scrotum before birth
- Cryptorchidism-when testes have not descended
- Location of the urethral opening should be on the tip of the penis
- A white cheesy substance (smegma) is found under the foreskin
- School age child taught to retract skin and clean; replace skin
- Some parents may choose to have their child circumcised while others may not
  - Whatever their decision, proper care of the male genitalia must be taught to the parents



# Circumcision

- Surgical removal of foreskin on the penis
- If hypospadias is present should not circumcise; skin maybe needed for surgery
  - Benefits
    - Decrease risk of penile cancer
    - Fewer UTIs
    - Fewer STIs
  - Disadvantages
    - Infection
    - Hemorrhage
- Infant must be physiologically stable prior to performing circumcision



## Circumcision

- Surgical removal of foreskin on the penis
- Gomco clamp and Plastibell clamp devices commonly used
  - If Gomco clamp used petroleum jelly or impregnated gauze with petroleum jelly is used to protect from moisture
  - If Plastibell clamp is used foreskin tied over ring and excess prepuce is removed; usually falls off in 5-8 days; do not remove prematurely; dark brown or black ring encircling ring is natural



## Circumcision

Jewish custom is to do circumcision on 8<sup>th</sup> day after birth; receives Hebrew name

Muslim also favor circumcision

Considered passage of rite in African tribes

Nurse's role-assess parental knowledge; consent signed; not fed 1-2 hours before; bulb syringe is kept close; heat lamp to prevent cold stress; local anesthetic; voidings recorded; assess bleeding; irritation; infection

Diaper is applied loosely



## Female Genitalia

- May be slightly swollen
- Thin, white or blood-tinged mucus may be discharged from the vagina (pseudomenstruation) caused by hormonal withdrawal from the mother
- Cleanse the vulva from the urethra to the anus to prevent fecal matter from entering the urinary meatus, leading to UTI



# Integumentary System

- Assess turgor and overall skin condition
  - Usually covered with fine hair called *lanugo* (disappears within a week of birth)
  - Covered in vernix caseosa—made of cells and glandular secretions; thought to protect skin from irritation and effects of a watery environment
  - Milia white pinpoint “pimples”—caused by obstruction of sebaceous glands on nose and chin and disappear
  - In order to get correct assessment of creases in the skin such as in the soles of the feet, the areas need to be assessed within 2 hours of birth
  - Physiological jaundice (icterus neonatorum) seen as a yellow tinge to the skin; caused by the rapid destruction of excess red blood cells



# Integumentary System

- Assess turgor and overall skin condition
  - Stork bites (telangiectatic nevi) flat red areas on nape of neck and eyelids
  - Mongolian spots bluish discoloration of skin in African Americans, Native Americans, Mediterranean descent will disappear early years of life
  - Peeling skin is normal in first few days
  - Acrocyanosis blueness of hands and feet normal-pallor not normal and should be reported
  - Wet diapers should be changed often preventing chafing
  - Physiological jaundice (icterus neonatorum) seen as a yellow tinge to the skin; caused by the rapid destruction of excess red blood cells happens on 2<sup>nd</sup> to 4<sup>th</sup> day and then jaundice appears and lasts about a week



## Safety Alert

- Jaundice that appears in the first day of life is not normal and should be recorded and reported
- If infant receiving phototherapy need to ensure assess for possible dehydration
- Two types of assess jaundice are
  - Icterometer-plastic strip different levels of yellow placed on skin at nose until skin blanches; match the undertone to corresponding yellow
  - Transcutaneous bilirubin measurement-noninvasive; screening device

Go over Table 12-3 Common Skin Manifestations of the Newborn



- **Table 12-2 Changing Laboratory Values**

	Newborn	7 Days	3 Months
Hemoglobin (Hgb) (g/dL)	18.5	17	11.3
Hematocrit (Hct)	56	44	35
White blood cell count (WBC)/mm <sup>3</sup>	18,000	12,000	10,800
Bilirubin (mg/dL)	6	12	1



## Interactive Bath

### Bathing:

Gloves used for first bath

Alkaline soaps, oils, and lotions not advised; powders avoided

Sponge baths until cord falls off and heals; tub baths are acceptable; needs bath 2-3 times a week with plain water

Observe behavior, muscle activity, and well being

Water temperature-37.8° C (100° F) in a warm room environment at 24° to 27° C (75° to 80° F).

Prevent chilling; face first then down the body; shampooing is done last





## Gastrointestinal System

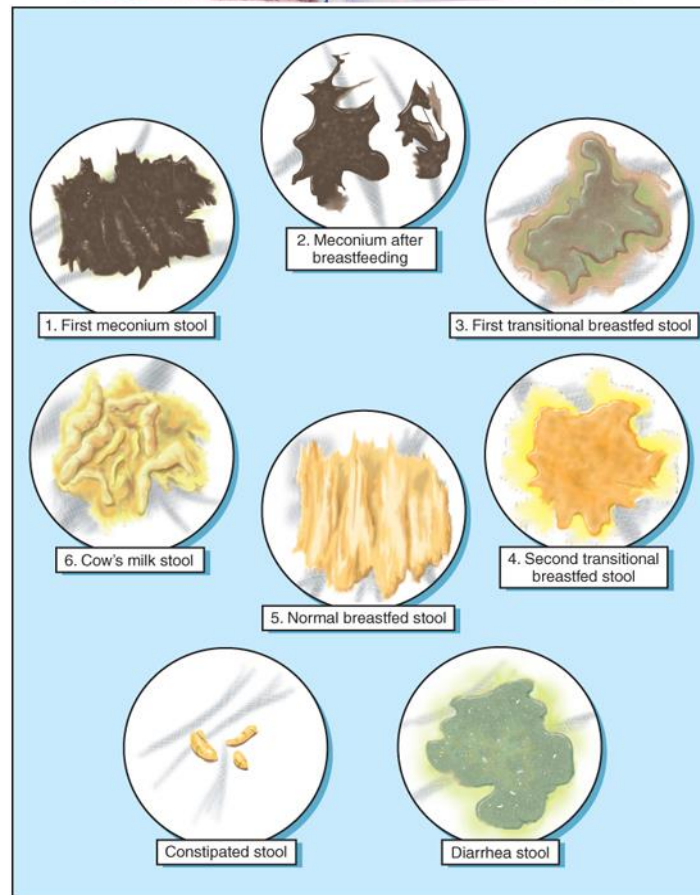
- Normal functions begin shortly after birth
- Meconium, the first stool, is a mixture of amniotic fluid and intestinal gland secretions; sticky, greenish-black, thick, and passed 8 to 24 hours after birth
- Stool color and consistency change over time
- Color, amount, and consistency are somewhat dependent upon what the infant is fed (breast milk versus formula)



## Gastrointestinal System

- Breastfed-bright yellow, soft, and pasty; 3-6/day
- Bottlefed-more solid, vary in color from yellow to brown; 1-4/day decreasing to 1-2/day
- Iron supplements will make stools darker in color
- Phototherapy will cause infant to have green stools
- Small putty-like stools or diarrhea and bloody stools abnormal

# Normal Infant Stool Cycle





## Gastrointestinal System Upsets

- Constipation-5 to 6 days without stool is not abnormal; increase water intake; if eating solids increase fruit and vegetables and whole grain cereal; straining in the newborn period results from undeveloped abdominal musculature
- Hiccoughs-normal; burping and warm water might help
- Digestion-capacity of stomach about 90 mL and empties in 2-3 hours; feeding often will stimulate gastrocolic reflex and result in stool being passed
- Vitamins-need extra C and D; mother's milk has C and D can be added to commercial milk; vitamin preparations may be prescribed-given by dropper directly in mouth; done at same time each day



# Preventing Infections

- Newborn's response to inflammation and infection is slow because of the immaturity of the immune system
- Breastfeeding provides some immunity to some disease processes but infant will still have some infections due to immunity system not fully developed
- Umbilical cord stump primary site of infection if not kept clean
- Hand hygiene is the primary means of preventing infection and/or its spread





## Immunoglobulin G (IgG)

- Crosses the placenta and provides newborn with *passive* immunity
- Rarely lasts longer than 3 months



## Immunoglobulin M (IgM)

- Produced by the newborn
- Elevated level suggests serious infection



## Immunoglobulin A (IgA)

- Produced after neonatal period (about 1 month) ends
- Contained in breast milk
- Provides some resistance to respiratory and gastrointestinal infection
  - Before age 1 month, infants are at risk for such infections



## Discharge Planning and Parent Teaching

- Begins upon admission of the laboring mother
- Areas may include
  - Basic infant care
  - Safety measures
  - Immunizations
  - Support groups
  - Return appointments
  - Proper use of a car seat
  - Signs and symptoms of problems and who to contact

- Feeding-Review Chapter 9
- Furnishings-crib with firm mattress; fitted sheets; lightweight cotton blankets; no pillow; flat top area for changing diapers and clothes; separate linen hamper for clothes and closed receptacle for diapers
- Clothing-wash new before using; mild soap and rinse thoroughly
- Skin care-if rash present on buttocks leave open to air when possible; change diaper as soon as possible