

Newborn Assessment

Gestational Age:

Preterm: Born before 37 0/7 weeks gestation

Term: Born between 37 0/7 and 41 6/7 weeks gestation

Postterm: Born at 42 0/7 weeks and beyond

Head-to-Toe Assessment:

- Complete within 12 hours after birth
- Good hand hygiene
 - o Wash with soap and water first, can use hand sanitizer after that
- Look at general appearance
- Normal vital signs
 - o RR, HR, Temp: Q4 hours
 - o BP not regularly measured unless cardiac issue suspected
- A. Weight and Measurements
 - a. Weight: 5lb 8oz to 8lb 13oz or 2500-4000grams
 - b. Length: 19 to 21 inches or 48-54cms
 - c. Head circumference: 12.5 to 15 inches or 32-38cm... no more than 2 inches bigger than the chest
 - d. Chest circumference: within 2 cm of the head
- B. Skin
 - a. Pink, intact, warm
 - b. Turgor should be elastic
 - c. At birth= bluish/pale pink/pink/red
 - d. Beefy red at about 6-12 hours of life and will resolve to normal gradually
 - e. Ecchymosis
 - f. Petechiae
 - g. Acrocyanosis: blue hands and feet, pink body
 - h. Vernix Caseosa: protective substance secreted from sebaceous glands. Antimicrobial properties. Decreases as fetus nears gestation
 - i. Lanugo: fine downy hair found heaviest on back, shoulders, forehead. Abundance of lanugo may be sign of prematurity
 - j. Cracking/desquamation: peeling of skin seen with postmaturity and within a couple of days after birth
 - k. Milia: white papules on face
 - l. Erythema Toxicum: rash with white or yellowish papules surrounded by reddened skin
 - m. Harlequin Sign: one side pale and other side deep red. Caused by mild changes in temperature, position, or mood causing vasomotor instability
 - n. Jaundice: yellowing of skin. First seen on face, blanch test on nose or sternum.
 - o. Circumoral cyanosis: bluing around mouth
 - p. Slate Grey Nevi: flat bluish discolored area on lower back/buttock.
 - q. Nevus Simplex: small, dilated blood vessels near surface of skin or mucous membranes
 - r. Café au lait spots: flat pigmented spots. Benign if less than 6 on body.

- s. Nevus Flammeus: discoloration of skin caused by asymmetric postcapillary venule malformation
- t. Infantile Hemangioma: tangled group of blood vessels growing under dermal layer of skin

C. Head

- a. Symmetric in shape and appear normal in size
- b. Fontanel: normal soft areas on head
 - i. Anterior- diamond shaped. Closes by 18 months
 - ii. Posterior- small, triangle shaped. Closes by 2-4 months
 - iii. Allow for fetal head to mold and elongate as head adapts to birth canal
- c. Molding: overlapping of suture lines to allow baby to fit through birth canal
- d. Caput Succedaneum: edema of scalp tissue that crosses suture line. From pressure of pelvis or cervix on head with vertex presentation
- e. Cephalohematoma: hematoma of scalp with unilateral swelling as a result of ruptured blood vessels during labor and delivery. Does not cross suture line. Bleeding between bone and periosteum (dense layer of vascular connective tissue that surrounds bone)
- f. Subgaleal Hemorrhage: bleeding into subgaleal space. Usually from difficult operative delivery (vacuum extraction). Early signs of hemorrhage- boggy scalp, pallor, tachycardia, increasing head circumference. Rare but life threatening.

D. Eyes

- a. Sclera should be white or bluish color
- b. Outer canthus of eye should be even with superior position of where ear attaches to head
- c. No tear production until 6 months of age
- d. If purulent discharge suspect infection
- e. Strabismus and nystagmus normal due to immature muscular control
- f. Abnormal findings:

E. Nose

- a. Observe for nasal flaring and nasal stuffiness

F. Mouth

- a. Lips and palate intact?
- b. Frenulum: tight or moves freely?

G. Chest

- a. Barrel shaped and symmetric
- b. May see clear/milky fluid from nipples
- c. Lungs clear and equal bilaterally
 - i. Crackles may be heard early on
- d. Normal RR 30-60
- e. Diaphragmatic breathing
- f. Auscultate for HR and murmurs
 - i. HR 110-160
 - ii. If crying, HR may be >160
 - iii. If sleeping, HR may be <110
- g. Capillary refill <3 seconds

- h. Abnormal: Dextrocardia, bowel sounds heard clearly in chest
- H. Abdomen
 - a. Bowel sounds: auscultate all 4 quadrants. Hypoactive at first, then become present
 - b. Large amounts of mucous are normal in first few hours of life
 - c. Should pass meconium in first 24-48 hours of life
 - d. Abdomen should be soft and nondistended
 - e. Umbilical cord: check cord, clamp, base of stump for redness
- I. Musculoskeletal
 - a. Normal range of motion
 - b. General attitude of flexion
 - c. Count digits
 - d. Arms equal and symmetrical
 - e. Legs equal and symmetrical
 - f. Closed spinal column
 - g. Gluteal folds equal
- J. Neurologic
 - a. Reflexes (see handout):
 - i. Rooting
 - ii. Sucking
 - iii. Tonic neck
 - iv. Moro
 - v. Grasp (palmar and plantar)
 - vi. Babinski
 - b. Abnormal findings:
 - i. Lethargy
 - ii. Convulsions
 - iii. Jittery
 - iv. Quivering
 - v. Paralysis
 - vi. Floppy body
- K. Genitourinary
 - a. Increased pigmentation due to pregnancy hormones
 - b. Female: clitoris and labia majora usually edematous. Can have pseudomenstruation caused by pregnancy hormones
 - c. Male: increased size due to pregnancy hormones. If uncircumcised- foreskin will cover glans penis. If circumcised- can visualize urinary meatus at tip of glans. Testes palpable on both sides
 - d. Void within 24 hours

Gestational Age Assessment

Done within first 48 hours of birth

Fetus develops in an orderly fashion; we can assess maturation and identify gestational age.

Two parts to the assessment: neuromuscular and physical maturity

Neuromuscular

- A. Develops at a constant rate which allows for objective means of assessing gestational age.
- B. Neuromuscular scale evaluates the angle at which resistance is met with different position changes
- C. Posture
 - a. Infant quiet in a supine position on flat surface, observe the degree of flexion in arms and legs
 - b. Muscle tone and degree of flexion increase with maturity
 - c. Full flexion of arms and legs = score of 4
- D. Square Window
 - a. With thumb supporting back of the arm below the wrist, apply gentle pressure with index and third fingers on dorsum of hand without rotating infant's wrist
 - b. Measure angle between base of thumb and forearm
 - c. Full flexion (hand lies flat on ventral surface of forearm) = score of 4
- E. Arm Recoil
 - a. With infant supine, fully flex both forearms on upper arms and hold for 5 seconds, pull down on hands to fully extend, and rapidly release the arms
 - b. Observe for rapidity and intensity of recoil to a state of flexion
 - c. A brisk return to full flexion = score of 4
- F. Popliteal Angle
 - a. With infant supine and pelvis flat on firm surface, flex lower leg on thigh and then flex thigh on abdomen
 - b. While holding knee with thumb and index finger, extend the lower leg with index finger of other hand.
 - c. Measure degree of angle behind knee (popliteal angle)
 - d. An angle of less than 90 degrees = score of 5
- G. Scarf Sign
 - a. With infant supine, support head in midline with one hand; use the other hand to pull the infants arm across the shoulder so that infant's hand touches shoulder
 - b. Determine location of elbow in relation to midline
 - c. Elbow does not reach midline= score of 4
- H. Heel to Ear
 - a. With infant supine and pelvis flat on a firm surface, pull foot as far as possible (without using force) up toward ear on same side
 - b. Measure distance of foot from ear and degree of knee flexion (same as popliteal angle)
 - c. Knees flexed with a popliteal angle of less than 10 degrees= score of 4

Physical

- A. Looks at newborn's appearance
- B. Newborn will look more "normal" closer to term
- C. Skin
 - a. Evaluate transparency, texture, thickness, peeling, and/or cracking
 - b. As newborn approaches term, there is increased subcutaneous tissue
 - c. Preterm newborns have thinner skin with prominent and multiple veins

- d. Term newborns have opaque and thicker skin, may have some degree of peeling/cracking
 - e. Postterm newborns have no visible veins, thick skin, and is peeling and cracking
- D. Lanugo
 - a. Initially no lanugo
 - b. Begins to develop around 12 weeks gestation
 - c. Thickest around 24 weeks
 - d. Becomes scant by term
 - e. Usually thickest on back and shoulders
- E. Plantar Surface
 - a. Superficial creases on the bottom of the foot
 - b. Creases begin developing at the top of the foot (by toes) and proceed to the heel with increased gestational age
- F. Breast
 - a. Inspect areola and gently palpate breast bud tissue and measure tissue between fingers
 - b. Areola and breast tissue will increase in size/amount closer to term
- G. Ear
 - a. Cartilage increases with gestation
 - b. Initially shapeless and flat, becomes firmer, stands away from head. Closer to term if folded, the pinna will spring back quickly
- H. Genitals- Male
 - a. Evaluate scrotal size, descent of testes, and presence of rugae on testes
 - b. Preterm will have undescended testes, scrotum will be small, close to groin area and smooth
 - c. Term will have descended testes; scrotum will be pendulous and covered with rugae
- I. Genitals- Female
 - a. Evaluate clitoris and labia size
 - b. As baby develops, labia majora increase in size and cover the clitoris then the labia minora

Newborn Care

- A. ATI Supplemental Information: Engage Pediatrics RN: Caring for Pediatric Clients Across the Lifespan: Newborns 2 to 28 days
- B. Newborn Bath
 - a. Purposes: cleanse the skin, observe infant's condition, promote comfort, parental education, parent-child-family interaction
 - b. Use gentle cleanser without preservatives or scents
 - c. Can be sponge bathing, immersion, or swaddled bathing
 - i. Typically sponge baths until cord falls off
 - ii. Bathe one body part at a time, dry as you go so that baby does not lose heat
 - iii. Immersion bathing has been found to allow less heat loss and provoke less crying
 - iv. Swaddled bathing- baby is swaddled in towel or blanket and immersed in warm water, one body part is unwrapped and washed at a time

- d. Baths- delayed at least 2 hours after birth until neonate has reached thermal and cardiorespiratory stability
 - e. Delayed bathing- waiting at least 24 hours to bathe after birth.
 - f. After bath- dry, diaper, and wrap in warm blankets, cap placed on head. 10 minutes later, newborn is dressed, wrapped in warm blankets, and cap is changed (old one may be damp)
- C. Cord Clamp and Care
- a. Cleaning cord with water during initial bath
 - b. Plastic cord clamp may be removed after stump has dried
 - c. Stump and base assessed for edema, erythema, and purulent drainage with each diaper change
 - d. Keep area clean, dry, open to air or loosely covered with clothing
 - e. Fold diaper under cord
 - f. Begins to dry, shrivel and blacken by second or third day of life
 - g. Deteriorates through process of dry gangrene- odor alone is not a positive indicator of omphalitis (infection of the umbilical stump)
 - h. Cord will fall off in 10-14 days on own- do not pull off
 - i. Teach parents all of this!!!
 - j. Clean water and pat dry if area soiled. Air dry. Make sure diaper doesn't irritate the area.
 - k. ATI → Student View → My ATI → Skills Modules 2.0 → Maternal Newborn → Lesson → Step by step viewing → Umbilical Cord Care
- D. Swaddling
- a. Provide comfort and soothing to baby
 - b. Provides warmth
 - c. Do not wrap/swaddle too tight
- E. Diapering and Stools
- a. Change frequently and fold diaper down to allow cord to dry
 - b. Meconium- thick, tarry, black stool. Lasts a couple of days
 - c. Transitional stool begins around third day
- F. Feeding
- a. Breastfeeding is recommended for infants
 - b. Exclusively for first six months
 - i. Begin food introductions, but continue breastfeeding
 - c. Breastmilk is the perfect milk as mother's body will adapt to newborn's needs
 - d. Breastfeed 8-12 times in a 24-hour period
 - e. No cow milk under the age of 1!
 - i. Not easily absorbed
 - ii. Lacks nutrients
 - iii. Difficult for the kidneys to filter
 - iv. Protein levels too high
 - f. Benefits for baby:
 - i. Reduced Risk for:
 - 1. GI infections

2. NEC
3. Crohn's and Ulcerative Colitis
4. Lower Respiratory Tract infections
5. Acute Otitis Media
6. Obesity
7. DM2
8. Acute Lymphoblastic Leukemia
9. SIDS
- ii. Enhanced neurodevelopmental outcomes
- iii. Higher intelligence
- g. Benefits for mom:
 - i. Decreased postpartum bleeding
 - ii. Reduced Risk for:
 1. Ovarian and breast ca
 2. Type 2 DM
 3. HTN
 4. CV disease
 - iii. Delayed return of menses
 - iv. Unique bonding experience
- h. Benefits for Family
 - i. Convenient; ready to feed
 - ii. Cost effective
 - iii. Reduced annual healthcare costs
 - iv. Less parental absence from work due to sick infant
 - v. Reduced environmental burden (less waste)
- i. Uniqueness of Human Milk
 - i. Composition changes to meet the needs of the infant
 - ii. Highly complex with anti-infective and nutritional components combined with growth factors, enzymes that aid in digestion and absorption of nutrients, and fatty acids that help with brain development
 - iii. More easily digested than commercial formula
 - iv. Contains immunologic properties to help protect against some infections
 - v. Promotes colonization and maturation of the infant's intestinal microbiome
- j. Contraindications to Breastfeeding and feeding EBM
 - i.
 - ii.
 - iii.
 - iv.
 - v.
- k. Establishing an appropriate latch
 - i. Calm environment
 - ii. Hold baby skin to skin (belly to belly)
 - iii. Let baby lead
 - iv. Support baby but don't force latch

- v. Allow breast to hang naturally
- l. Signs of a good latch
 - i. Latch feels comfortable
 - ii. Baby's chest rests against mom's body
 - iii. Can see little to no areola (depending on size of areola and baby's mouth)
 - iv. Baby's tongue is cupped under breast
 - v. Can see or hear baby swallow
 - vi. Lips are turned outward like a fish
 - vii. Baby's chin touches breast
 - viii. Baby's nose grazes breast
 - ix. Nipple looks the same coming out as going in
- m. How to know baby is getting enough
 - i. Number of feeding sessions
 - ii. Amount of soiled diapers
 - iii. Weight of baby
- n. Review the Skills Module about Breastfeeding on ATI: Skills Modules 3.0 > Learning Modules > Maternal Newborn > Topics > Assessment and Care of the Newborn > Step-by-Step > Breastfeeding Guidelines (3:24 minute video).
- o. Formula Feeding
 - i. Provide education on breast feeding, let mom make an informed decision
 - ii. Advantages: decreased frequency, others may help
 - iii. Disadvantages: prep time, cost, allergies, childhood obesity, lacking passive immunity from mom to baby
 - iv. Contains 20kcal/oz
 - v. Powder and concentrate require mixing with water. Read instructions
 - vi. Ready made is pour and feed
 - vii. Milk and soy-based formulas.
- p. Nipples
 - i. Different flow rates for different babies
 - ii. Fast flow vs slow flow
 - iii. Different shape nipples for different needs
- q. Bottles
 - i. BPA free bottles
 - ii. Always teach parents to boil supplies before first use
 - iii. 5 minutes boiling
 - iv. Airdry supplies
 - v. Wash thoroughly after feeding with hot soapy water and bottle brush
- r. Positioning and Feeding Rules
 - i. Never prop a bottle
 - 1. Risk for aspiration
 - 2. Increased risk for middle ear infections
 - 3. Eating is a social event- babies need human contact with feedings
 - ii. Burp frequently
 - iii. If giving a breastfed baby a bottle, pace the feeding

- iv. Never warm in microwave
- v. Feed on demand at least every 3-4 hours for bottles

G. Universal Newborn Screening

- a. Hereditary Metabolic Disease Panel (HMD)
 - i. Screens for 34 core disorders and 26 secondary disorders
 - ii. Done by heel stick
 - iii. Performed after 24 hours of protein feedings
- b. Hearing Screen
 - i. Screens for hearing loss
 - ii. Otoacoustic Emissions (OAE): soft rubber earpiece inserted, it clicks, measures sound bouncing off or echoing off the ear and back to the earpiece
 - iii. Auditory Brainstem Response (ABR): electrodes placed on baby's forehead, nape of neck, and back. Sounds are sent into ear; sensors pick up electrical current produced by the acoustic nerve in response to sounds
 - iv. Perform after first bath completed
 - v. Neither are definitive diagnostic but a screening tool to determine if further testing needs to be done
- c. Transcutaneous bilirubin test
 - i. Screens for jaundice
 - ii. Bilirubin can build up in blood stream due to immature liver
 - iii. Plotted based on age and level to determine treatment
- d. Critical Congenital Heart Disease
 - i. Noninvasive screening test performed with pulse oximetry to measure oxygen saturation to detect hypoxemia
 - ii. Performed at 24-48 hours of age after transition from fetal to newborn circulation has occurred
 - iii. Preductal and postductal levels need to be >95% and within 3% of each other

H. Circumcision

- a. Elective cosmetic procedure to remove foreskin that surrounds glans of penis
- b. Benefits: decreased incidence of UTIs, STIs, and penile ca
- c. Lidocaine nerve block and pacifier with sucrose for analgesia
- d. MD uses clamp device: gomco, mogen, plastibell
- e. Foreskin removed
- f. Vaseline to glans with every diaper change
- g. Observe for urine output
- h. If bleeding- apply pressure for 5 minutes with clean dry gauze. If continues, call MD

I. Safe Sleep

- a. SUID
 - i.
 - ii.
 - iii.
- b. SIDS
 - i. Sudden Infant Death Syndrome
 - ii. Death of infant less than 1 year

- iii. Leading cause of death in infants
- iv. Peaks between 2 to 4 months
- v. Silent illness, no symptoms, just death
- vi. Not caused by suffocation, vomiting, choking, or vaccines
- vii. Decline of SIDS since Back to Sleep campaign in 1994

c. SIDS Risk Factors

i. Non-Modifiable:

- 1. Premature
- 2. Race/ethnic groups
- 3. Genetic, metabolic, brainstem abnormalities
- 4. Mother <18y/o
- 5. Late or no prenatal care
- 6. Male gender
- 7. Age: 2 to 4 months

ii. Modifiable

- 1. Drug exposure
- 2. Tobacco exposure
- 3. Sleep position
- 4. Loos or soft bedding
- 5. Bed sharing
- 6. Overheating

d. AAP Recommendations

- i. On back
- ii. Firm sleeping surface- crib or bassinet with fitted sheet
- iii. One piece sleeper or swaddle
- iv. Share a room with parents- but not the same sleeping surface
- v. Avoid bumpers, blankets, pillows, toys
- vi. Avoid exposure to smoke, alcohol, and illicit drugs
- vii. Skin to Skin care
- viii. Breastfeeding- place baby back in safe environment after feeding
- ix. Offer pacifier at nap/bedtime after feeding has been established
- x. Do not use home monitors or commercial devices
- xi. Supervised awake tummy time daily to facilitate development

e. ABC's of Sleep

- i. A
- ii. B
- iii. C

J. Periods of Reactivity

- a. 0-30 minutes of life: bursting with movement, eager to feed
- b. 30-60 minutes of life: sleepy, not interested in sucking, start to stabilize with less movement, difficult to awaken
- c. Few hours after birth: becomes active again, ready to feed again

K. Going home

- a. Education:

- i. Shaken baby
 - ii. Safe sleep
 - iii. Car seat safety
 - iv. Bathing
 - v. Cord care
 - vi. Diapering
- b. Follow up appointments
- c. Cord clamp off
- d. One mom-baby band off
- e. Security band disabled and cut off
- f. Referrals- WIC, home nurse visits, lactation consultant, ENT