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
  - Wash with soap and water first, can use hand sanitizer after that
- Look at general appearance
- Normal vital signs
  - RR, HR, Temp: Q4 hours
  - BP not regularly measured unless cardiac issue suspected

A. Weights and Measures
   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
   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. Fontanels: 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 for maturation and identify gestational age.

2 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. Rhickest 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 black 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. Crohns and UC
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