NEWBORN ASSESSMENT

Newborn Fellowship 2025

OBJECTIVES

- Verbalize important aspects of maternal and newborn history
- Discuss key components of newborn vital signs and reflexes
- Explore normal and abnormal newborn assessment findings

NEWBORN ASSESSMENT

ASSESSMENT TIPS

- Find your flow
- Be consistent *every* time
- Assessment environment:
  - Well lit room
  - Warm
  - Free of air drafts
  - At the bedside if medically appropriate
- Promote maternal involvement

HISTORY

- Obtain history prior to examination
- Includes maternal, prenatal & intrapartum history
- Alerts for risk factors
- Allows RN to anticipate plan of care
- History may be obtained from:
  - Prenatal records
  - RN to RN report
  - Interview of mother

HISTORY – PRECONCEPTION

- Maternal age
- Preexisting medical conditions
  - Diabetes
  - Hypertension
  - Cardiac disease
  - Anemia
  - Thyroid disorder
  - Renal disease
  - Obesity
- Genetic factors/family history
- Obstetric history
  - GTPAL
  - Previous infant with congenital anomalies
  - Habitual abortion
  - Use of assisted reproductive technology
  - Interpregnancy spacing
- Blood type and Rh status

(LOWDERMILK ET AL., 2024)

HISTORY – PRENATAL

- Prenatal care
- Nutrition
  - Weight gain
  - Diet
  - Obesity
  - Eating disorders
- Health-compromising behaviors
  - Smoking
  - Alcohol
  - Substance abuse

(LOWDERMILK ET AL., 2024)

HISTORY – PRENATAL

- Medications
  - Prescriptions
  - Over the counter
  - Complimentary/alternative medicine
- History of infection
  - STD
  - TORCH (toxoplasmosis, other infections, rubella virus, cytomegalovirus/CMV, herpes simplex virus
  - GBS

(LOWDERMILK ET AL., 2024)

HISTORY – INTRAPARTUM

- Length of gestation
  - Preterm
  - Late preterm
  - Early term
  - Term
  - Postterm
- 1st stage of labor
  - Length
  - EFM (internal or external)
  - Any sign of fetal distress (decels)
  - ROM (time, presences of meconium)
  - Spontaneous vs. induction

(LOWDERMILK ET AL., 2024)

HISTORY – INTRAPARTUM

- GBS status
  - Treatment during labor
- 2nd stage of labor
  - Length
  - Mode of delivery
  - Forceps or vacuum
  - Complications
    - Shoulder dystocia
    - Bleeding (abruption, previa)
  - Cord prolapse
  - Maternal analgesia/anesthesia
  - APGAR

(LOWDERMILK ET AL., 2024)

GESTATIONAL AGE CLASSIFICATIONS

- Preterm – < 37 0/7 weeks
- Late preterm – 34 0/7 – 36 6/7 weeks
- Early term – 37 0/7 – 38 6/7 weeks
- Full term – 39 0/7 – 40 6/7 weeks
- Late term – 41 0/7 – 41 6/7 weeks
- Postterm – 42 0/7 and beyond
- Postmature - >42.6 weeks + demonstrating effects of progressive placental insufficiency

(LOWDERMILK ET AL., 2024)

COMPLICATIONS RELATED TO GESTATIONAL AGE

Early-Term Infant (37 0/7 – 38 6/7 weeks)

- Increased risk of hypoglycemia, respiratory complications (TTN, RDS), & NICU admission

Late-Preterm Infant (34 0/7 – 36 6/7 weeks)

- Great impostors
- Gestational age assessment especially important to identify
- Increased risk for respiratory distress, temperature instability, hypoglycemia, apnea, feeding difficulties, and hyperbilirubinemia

Postterm (42 0/7 and beyond) & Postmature Infant (>42.6 weeks + demonstrating effects of progressive placental insufficiency)

- Commonly have wasted physical appearance
- Little – no vernix, absence of lanugo, abundant scalp hair, long fingernails, cracked/dry/peeling skin
- Increased risk for fetal distress r/t placental insufficiency, macrosomia, and meconium aspiration syndrome

NORMAL OVERALL APPEARANCE

As you begin your assessment, before even touching the infant, what do you notice about the following characteristics?

- Color
- Posture/tone
- Activity
- Size
- Maturity
- Quality of cry

VITAL SIGNS – NORMAL

- Heart Rate: 120-160 beats per minute
- Respiratory Rate: 30-60 breaths per minute
- Axillary Temperature: 97.7-99.5 F (36.5-37.5 C)
- Blood Pressure:
  - At birth: 60-80/40-50 mmHg
  - 2 weeks: 68-88/40-60 mmHg
  - Not assessed in normal term infant with no signs of concerns
- Cry:
  - strong and lusty
  - moderate tone and pitch
  - easily consoled

(LOWDERMILK ET AL., 2024)

VITAL SIGNS – NORMAL VARIATIONS

- Heart Rate:
  - As low as 80 beats per minute if in a deep sleep
  - Up to 180 beats per minute if crying
- Respiratory Rate:
  - Periodic breathing patterns: short pauses $\leq$ 3 seconds r/t immaturity of the respiratory & CNS
  - Periods of brief apnea: usually insignificant if the duration is < 15-20 seconds and no distress

(DAVIDSON ET AL., 2020; LOWDERMILK ET AL., 2024)

VITAL SIGNS – NORMAL VARIATIONS

- Temperature:
  - 97.5-100.0
    - Environmental temperature too low or high
    - Heat loss from evaporation, conduction, convection, radiation
    - Overwrapped/dressed or skin to skin

(DAVIDSON ET AL., 2020; LOWDERMILK ET AL., 2024)

VITAL SIGNS – ABNORMAL VARIATIONS

- Heart Rate:
  - Persistent tachycardia (RDS, Pneumonia)
  - Persistent bradycardia (congenital heart block, maternal lupus)
- Respiratory Rate:
  - Apnea >20 seconds (preterm, rapid warming/cooling, CNS or blood glucose instability)
  - Bradypea <30/min (maternal narcosis)
  - Tachypnea >60/min (RDS, TTNB, congenital diaphragmatic hernia)

(LOWDERMILK ET AL., 2024)

VITAL SIGNS – ABNORMAL VARIATIONS

- Blood Pressure:
  - Hypotension (sepsis, hypovolemia)
  - Hypertension (coarctation of aorta, renal involvement, thrombus)
  - Difference between upper and lower extremities (coarctation of aorta)
- Temperature:
  - Low (Preterm, infection, dehydration, low environmental temperature, inadequate clothing)
  - High (infection, chemical dependence, diarrhea, dehydration, high environmental temperature, excessive clothing)
  - Instability persists at 8-10 hours of age

(DAVIDSON ET AL., 2020; LOWDERMILK ET AL., 2024)

VITAL SIGNS – ABNORMAL VARIATIONS

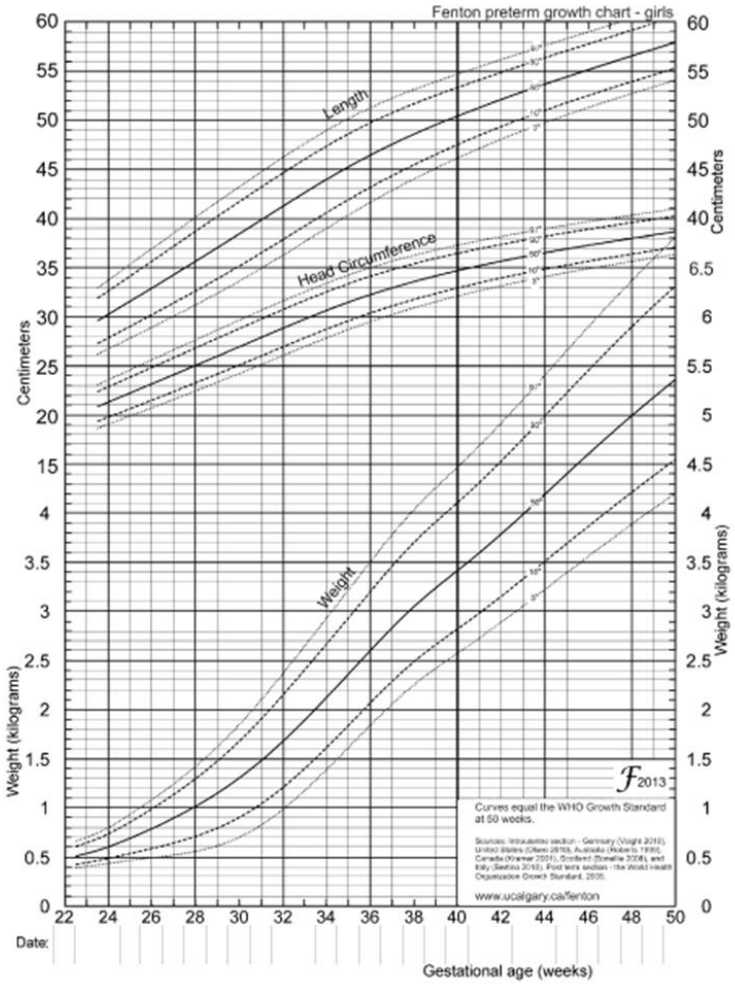
- Cry:
  - Inconsolable, shrill, or high pitched (pain, neurological disorder, hypoglycemia)

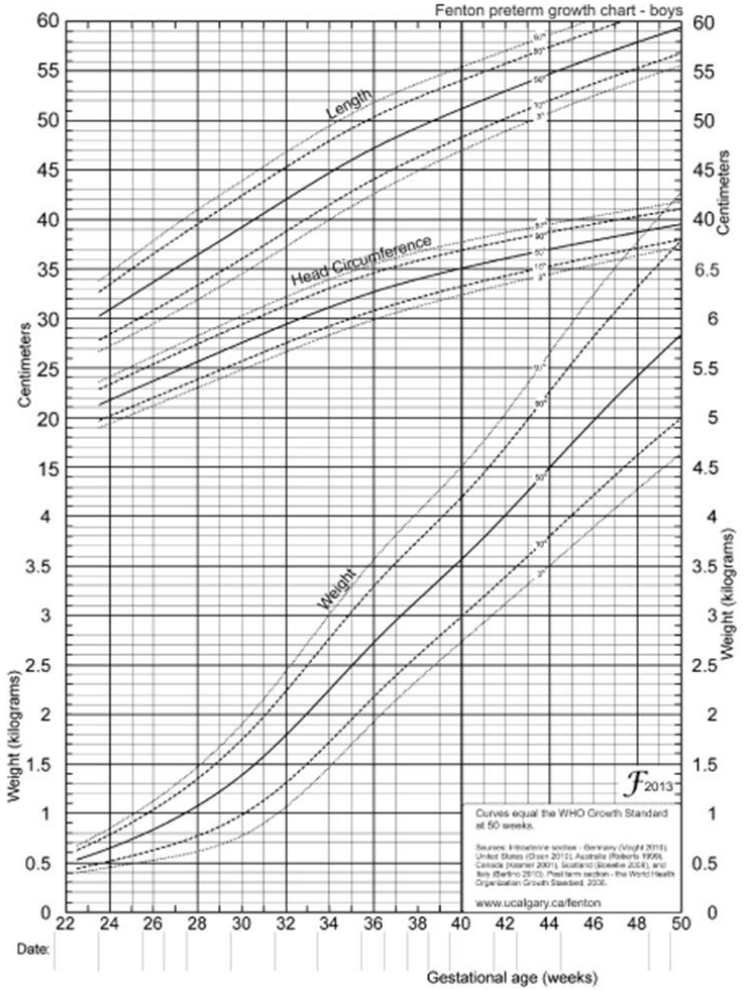
(DAVIDSON ET AL., 2020; LOWDERMILK ET AL., 2024)

WEIGHTS AND MEASUREMENTS

Type	Expected Finding	Normal Variations	Abnormal Variations
Weight	Term Female: 2700-3850g (6-8.5 lb) Term Male: 2800-4000g (6.2-8.8 lb)	Term: 2700-4000g (6-9 lbs); Acceptable weight loss ≤ 5-10% in first 3-5 days	• <2700g (preterm, SGA, rubella syndrome) • >4000g (LGA, IDM, heredity) • Weight loss > 10% (growth failure, breastfeeding difficulty, dehydration)
Length	46-56 cm (18-22 in)	46-56 cm (18-22 in)	• <46 cm (18in) or >56cm (22in) (chromosomal abnormality, hereditary, syndrome presenting with shorter than average limb length (skeletal dysplasias, achondroplasia))
Head Circumference	32-36cm (12.6-14.2in) Circumference of head and chest approx. the same for 1-2 days after birth	32-36cm (12.6-14.2in)	• Mircrocephaly, head <32cm (maternal rubella, toxoplasmosis, cytomegalovirus, fused cranial sutures – craniosynostosis) • Hydrocephaly, head > 36cm: sutures widely separated, circumference ≥ 4cm more than chest circumference (infection)
Chest Circumference	Term: 30-33cm (11.8-13in); 2-3cm (0.8-1.2in) less than head circumference	Term: 30-33cm (11.8-13in)	Prematurity: ≤ 30cm

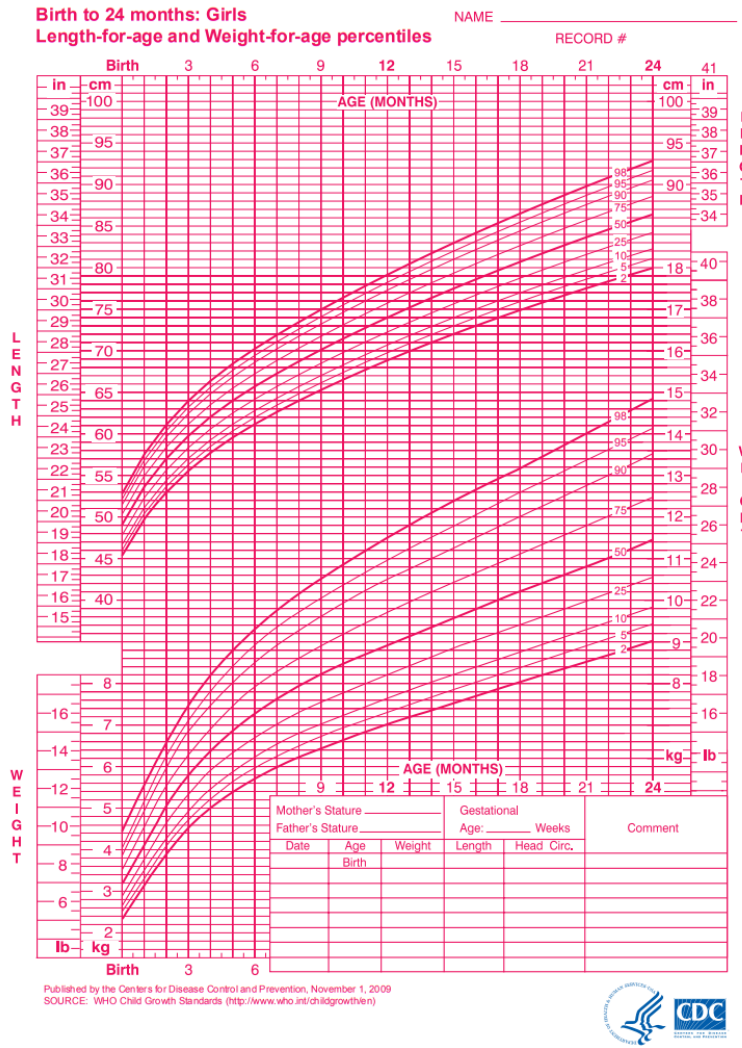
FENTON GROWTH CHART

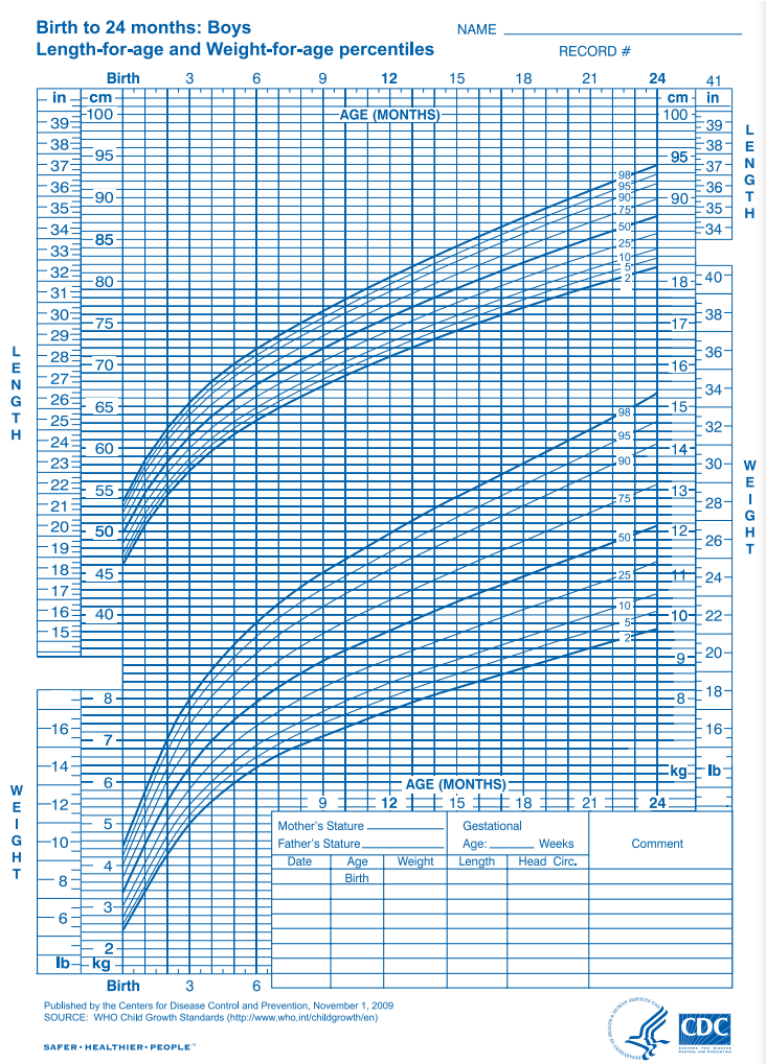




(HTTPS://WWW.MERCKMANUALS.COM/PROFESSIONAL/PEDIATRICS/PERINATAL-PROBLEMS/GROWTH-PARAMETERS-IN-NEONATES)

WHO GROWTH CHART





HTTPS://WWW.CDC.GOV/GROWTHCHARTS/INDEX.HTM

CLASSIFICATIONS OF NEWBORNS BY GESTATIONAL AGE AND BIRTHWEIGHT

Small for Gestational Age (SGA) – <10%

Average for Gestational Age (AGA) – 10-90%

Large for Gestational Age (LGA) – >90%

(LOWDERMILK ET AL., 2024)

CARDIOVASCULAR

Normal:

- Apical pulse is heard the loudest at the third or fourth intercostal space on the left midclavicular line (PMI)

Abnormal Variations:

- Murmur: a slur or slushing sound heard on auscultation
- Dysrhythmias
- Sound – distant, right side of chest or extra

RESPIRATORY – NORMAL

- Lungs clear and be free of adventitious sounds
- Fine crackles may be heard in the first hour after birth and should self-resolve, but warrants close observation.
- Diaphragmatic breathing: movement of the chest and abdomen should be synchronized during respirations – “Belly Breathers”

RESPIRATORY – VARIATIONS

Normal Variations:

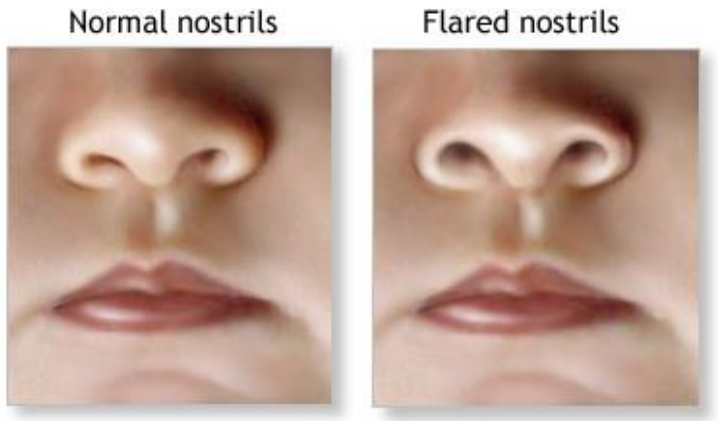
- Breaths tend to be shallow and irregular in rate, rhythm, and depth with infant is awake
- Fine crackles w/out signs of respiratory distress

Abnormal Variations:

- Adventitious breath sounds
  - Crackles
  - Rhonchi
  - Wheezing
  - Stridor
  - Grunting
- Moaning - "singing, cooing, or sighing"
- S/S respiratory distress:
  - Nasal flaring
  - Retracting
  - Labored breathing
  - See-saw breathing
  - Cyanosis

(LOWDERMILK ET AL., 2024)

RESPIRATORY DISTRESS



Circumoral Cyanosis

(STANFORD MEDICINE, 2017)

NEUROLOGICAL – NORMAL

- Attitude of flexion
  - Healthy, full term newborn should be symmetrically flexed with the legs commonly abducted to the abdomen (posture in utero)
- Movements purposeless and symmetrical
- Resist attempts to extend extremities during assessment

(DAVIDSON ET AL., 2020; LOWDERMILK ET AL., 2024)

NEWBORN REFLEXES

Reflex	Eliciting the Reflex	Newborn Response	Comments
Rooting/Sucking	Touch infant's lip, cheek, corner of mouth	Turns head toward stimulus, opens mouth, begins to suck when stimulus inserted in mouth	Difficult to elicit after feeding; weak/absent (preterm birth, maternal drug ingestion, or neuro defect)
Grasp - Palmer	Place finger in palm or hand	Fingers curl around nurse's finger	Decreases around 3-4 months of age
Grasp – Plantar	Place finger at base of toes	Toes curl around nurse's finger	Decreases around 8 months of age
Tonic Neck - "Fencing"	With infant in neutral supine position, turn head quickly to one side	Arm, leg on side infant is facing extend, while opposite side flex	Decrease around 3-4 months of age; Persistance after 6 weeks (possible cerebral palsy)

(LOWDERMILK ET AL., 2024)

NEWBORN REFLEXES

Reflex	Eliciting the Reflex	Newborn Response	Comments
Moro	Hold in semisitting position, allow head/trunk to fall backward to angle of ≥ 30 degrees	Symmetric abduction/extension of arms, fingers fan out and thumb/forefinger form a C, slight tremor may be noted, cray may accompany or follow	Response absent by 6 months of age; incomplete response may occur if in deep sleep state; asymmetric response (injury to brachial plexus, clavicle, or humerus); persistent after 6 months of age (possible neuro abnormality
Babinski (plantar)	On sole of foot, stoke upward from the heel along lateral aspect of sole; move finger across ball of foot	All toes hyperextend, with dorsiflexion of big toe; recorded as a positive sign	Absence requires neuro eval; should disappear after 1 year of age

(LOWDERMILK ET AL., 2024)

NEUROLOGICAL – VARIATIONS

Normal Variations:

- Legs straighter/stiff (frank breech)
- Brief, occasional jerky movements or twitching due to an immature neurological system

Abnormal Variations:

- Asymmetrical flexion or movements (birth trauma, neurological dysfunction)
- Persistent jitteriness or tremors (hypoglycemia, hypocalcemia, substance withdrawal, seizures)
- Hypotonia when awake (preterm, hypoxia in utero, maternal meds, neuromuscular disorder)
- Hypertonia (chemical dependence, CNS disorder)
- Limitation of motion

(DAVIDSON ET AL., 2020; LOWDERMILK ET AL., 2024; STANFORD MEDICINE, 2017)

SKIN – NORMAL

- Pink, warm, dry
- Intact, soft, smooth, and elastic
- Color consistent with ethnic background:
  - European descent – pink or ruddy appearance to face, trunk, extremities
  - African American, Native American – pink with yellow or red tinge
  - Hispanic or Asian – pink or rosy red to yellow tinge
  - Jaundice should be assessed, regardless of ethnicity, during your initial assessment and intermittently throughout your shift

(DAVIDSON ET AL., 2020; LOWDERMILK ET AL., 2024)

SKIN – NORMAL

- Acrocyanosis
- Dry and peeling hands and feet which is a normal finding
- Lanugo may be present over shoulders, ears, and forehead
  - Absent – postterm
  - Long/thick - preterm
- Vernix may be present especially in skin creases and folds - should be white and odorless

(DAVIDSON ET AL., 2020; LOWDERMILK ET AL., 2024)

SKIN – NORMAL

Acrocyanosis

Dry & Peeling Skin

(STANFORD MEDICINE, 2017)

SKIN – NORMAL

Lanugo

Vernix

(STANFORD MEDICINE, 2017)

SKIN – NORMAL VARIATIONS

- Ruddy skin color
- Mongolian spot
- Mottling
- Harlequin sign
- Telangiectases – "stork bites"
- Salmon patch (nevus simplex) – "angel kisses"
- Erythema toxicum/neonatorum – "newborn rash"
- Milia
- Petechiae – presenting part
- Ecchymosis – forceps/vacuum, buttocks/genitalia/legs in breech births
- No visible blood vessels or a few visible on abdomen
- Superficial cracking, peeling (postterm)
- Fingernail scratches
- Physiologic jaundice >24hrs of age

(LOWDERMILK ET AL., 2024)

SKIN – NORMAL VARIATIONS

Mongolian Spot

Harlequin Sign

(STANFORD MEDICINE, 2017; UNIVERSITY OF CHICAGO, 2013)

SKIN – NORMAL VARIATIONS

Mottling

(STANFORD MEDICINE, 2017)

SKIN – NORMAL VARIATIONS

Newborn Rash

Milia

(STANFORD MEDICINE, 2017)

SKIN – NORMAL VARIATIONS

Stork Bite

Salmon patch

(STANFORD MEDICINE, 2017)

SKIN – NORMAL VARIATIONS

Facial Bruising

Scalp Electrode Site

(STANFORD MEDICINE, 2017)

SKIN – NORMAL VARIATIONS

Forceps Marking

Vacuum Marking

(STANFORD MEDICINE, 2017)

SKIN – ABNORMAL VARIATIONS

- Abnormal skin turgor
- Deep cracking, fissures
- Green vernix (meconium stained fluid) or an odor (exposure to an intrauterine infection)
- Dark red (preterm, polycythemia, hypoglycemia)
- Pallor (hypothermia, hypotension, anemia, infection)
- Cyanosis (hypothermia, infection, hypoglycemia, cardiopulmonary disease, respiratory malformations, CNS damage/trauma)

(DAVIDSON ET AL., 2020; LOWDERMILK ET AL., 2024)

SKIN – ABNORMAL VARIATIONS

- Generalized petechiae (clotting factor deficiency, infection)
- Generalize ecchymosis (hemorrhagic disease)
- Hemangiomas
- Port-wine stain (nevus flammeus)
- Strawberry mark (nevus vasculosus)
- Numerous vessels visible over abdomen
- Skin tags, webbing
- Papules, pustules, vesicles, ulcers, maceration (impetigo, candidiasis, herpes)
- Pathologic jaundice <24hrs of age

(LOWDERMILK ET AL., 2024)

SKIN – ABNORMAL VARIATIONS

Meconium Staining

Icthyosis

(STANFORD MEDICINE, 2017)

SKIN – ABNORMAL VARIATIONS

Nevus Vasculosus "Strawberry Mark"

Nevus Flammeus "Port Wine Stain"

(STANFORD MEDICINE, 2017)

SKIN – ABNORMAL VARIATIONS

Petechiae

Bruising

(STANFORD MEDICINE, 2017)

SKIN – ABNORMAL VARIATIONS

Café Au Lait

Early Hemangioma

(STANFORD MEDICINE, 2017)

SKIN – ABNORMAL VARIATIONS

Jaundice

Jaundice after phototherapy

(STANFORD MEDICINE, 2017)

HEAD – NORMAL

- Approximately one fourth of her body size
- Round, symmetric, moves easily
- Molding (prolonged labor, vaginal delivery)
- Palpable and separated sutures
- Palpable fontanels
  - Assess when calm
  - Crying & stooling may alter assessment findings
- Note presence of bruising or edema

(DAVIDSON ET AL., 2020; STANFORD MEDICINE, 2023)

HEAD – VARIATIONS

Normal Variations:

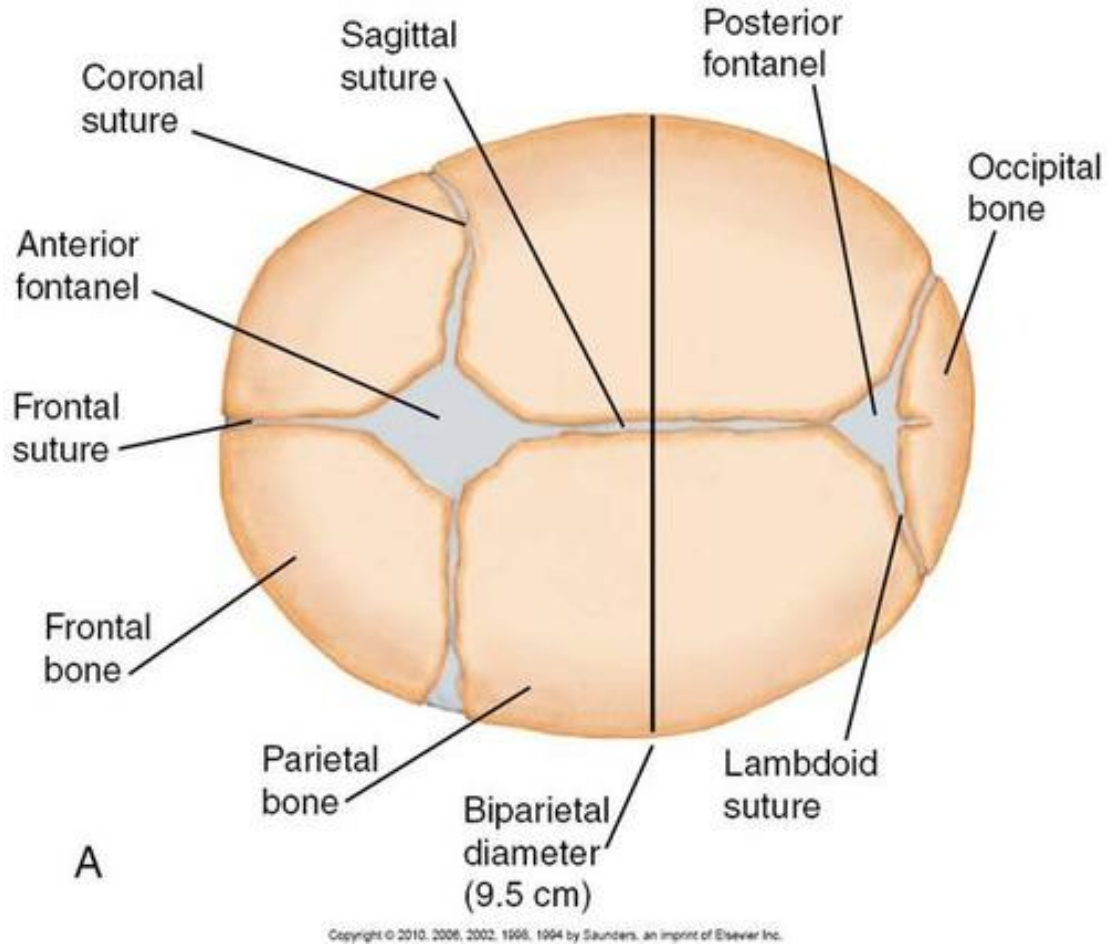
- Slight asymmetry (prolonged labor, vag delivery)
- Caput succedaneum
- Lack of molding (preterm, breech, C/S)
- Overlapping of sutures

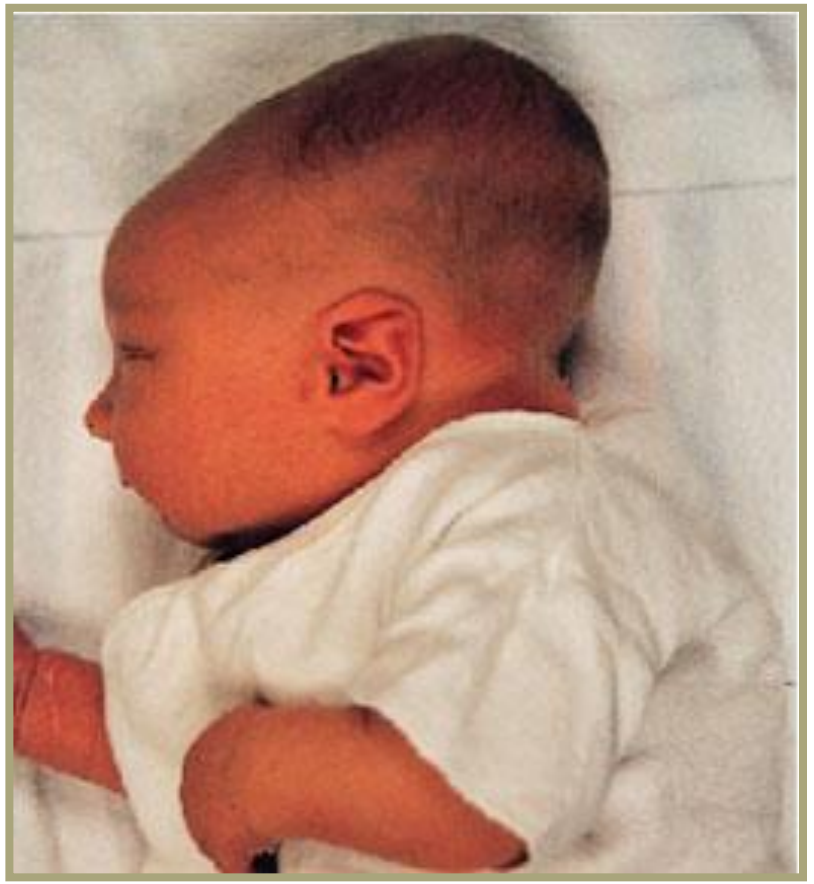
Abnormal Variations:

- Cephalhematoma
- Subgaleal hemorrhage
- Full, bulging fontanel (increased intracranial pressure, hemorrhage, infection)
- Large, flat, soft (malnutrition, hydrocephaly, delayed bone age, hypothyroidism)
- Depressed or sunken fontanel (dehydration)
- Widely spaced sutures (hydrocephaly)
- Premature fusing of sutures (Craniosynostosis)

(DAVIDSON ET AL., 2020; LOWDEMILK ET AL., 2020)

HEAD





HEAD – CAPUT VS. CEPHALOHEMATOMA

Caput Succedaneum:

- Edema on presenting part of scalp
- Result of prolonged labor or birth trauma
- Crosses suture lines
- Present at birth
- Does not increase in size
- Typically resolves within 12 hours to a few days after birth

Cephalohematoma:

- Gradual collection of blood between cranial bone and periosteal membrane
- Unilateral or bilateral
- Does not cross suture lines
- Appears after birth
- Increases in size for 2-3 days
- Resolves within 2 weeks to 3 months

(DAVIDSON ET AL., 2020; LOWDERMILK ET AL., 2024)

SUBGALEAL HEMATOMA

- Collection of blood in the subgaleal space
- Associated with birth trauma
- Crosses suture lines
- Increases in size
- May lead to hypovolemic shock
- Diagnosis – Measurements, MRI
- Treatment – volume resuscitation, blood replacement, treat clotting abnormalities

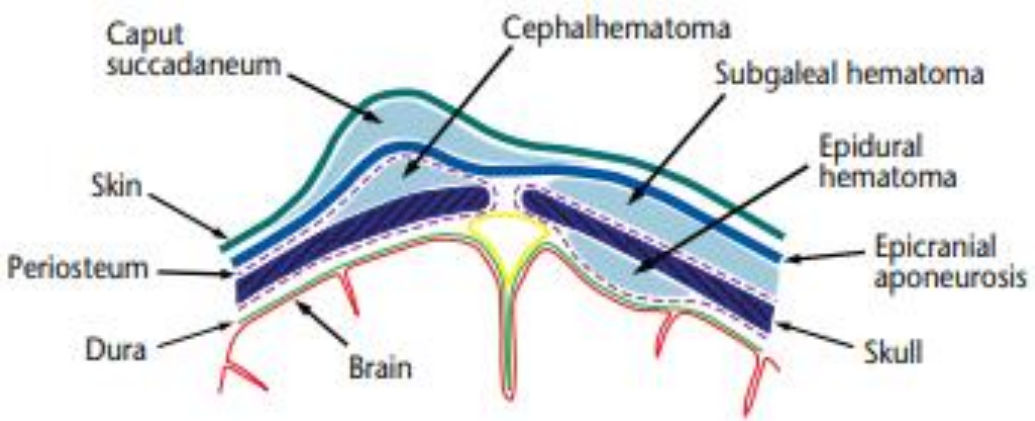
Early S/S:

- Expanding boggy scalp
- Pallor
- Prolonged capillary refill
- Tachycardia
- Decreased responsiveness and spontaneous activity
- Decreasing hct

- Late S/S:
  - Seizure activity

HEAD

Bilateral Cephalhematoma



(Nicholson, 2007, Neonatal Network, Birth Injuries Series #3)

Caput

(STANDFORD MEDICINE, 2017)

FACE

Normal

- Appear round and symmetric
- Symmetrical movements
  - Assess when the infant is crying

Variations

- Positional deformities
- Asymmetrical movements
- Facial nerve palsy (7th cranial nerve)
  - May be related to forceps assisted delivery
- Drooping mouth appearance

(DAVIDSON ET AL., 2020; LOWDERMILK ET AL., 2024)

EYES – NORMAL

- Symmetrical in size and shape
- Even placement - parallel plane
- Bright & clear
- React to light
- Edematous 1-2 days
- No discharge or tears

(DAVIDSON ET AL., 2020; LOWDERMILK ET AL., 2016; STANFORD MEDICINE, 2017)

EYES – VARIATIONS

Normal Variations:

- Subconjunctival hemorrhage
- Occasional presence of tears
- Transient strabismus (Cross eyed)
- Transient nystagmus (random, jerky, eye movements)
- Epicanthal folds – Asian descent

Abnormal Variations:

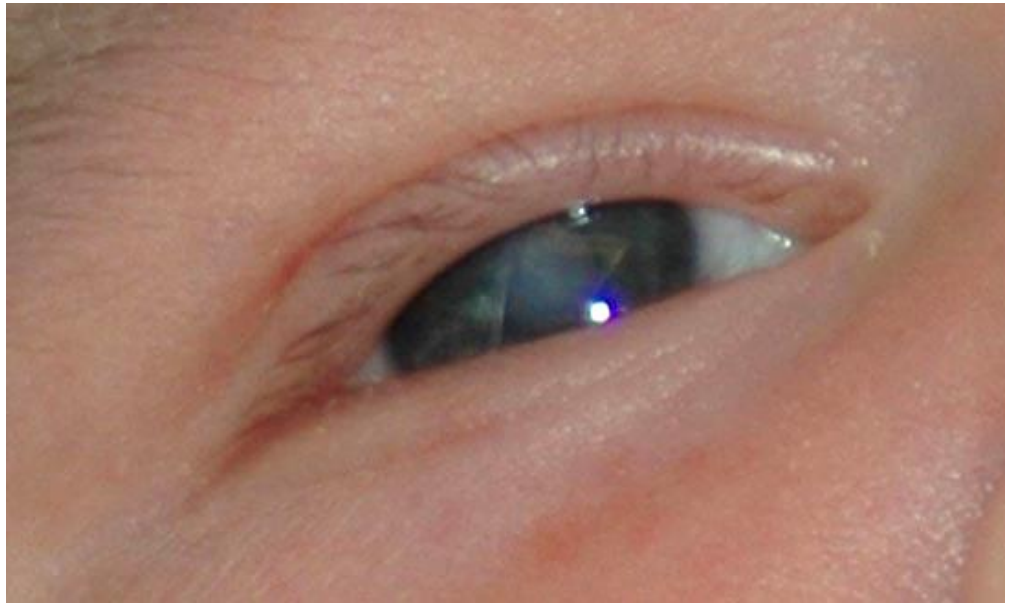
- Drainage/purulent discharge (infection)
- Lense opacity or absence of red reflex
- Jaundiced sclera
- Absent blink reflex (CNS injury)
- Pupils: unequal, constricted, dilated, fixed (intracranial pressure)
- Gross nystagmus (damage to cranial nerves 3, 4, 6)
- Persistent strabismus
- Epicanthal folds – non Asian descent (trisomy 21)

(DAVIDSON ET AL., 2020; LOWDERMILK ET AL., 2024)

EYES – VARIATIONS

Subconjunctival Hemorrhage

Lense Opacity (Peter's Anomaly)



(STANDFORD MEDICINE, 2017)

EARS – NORMAL

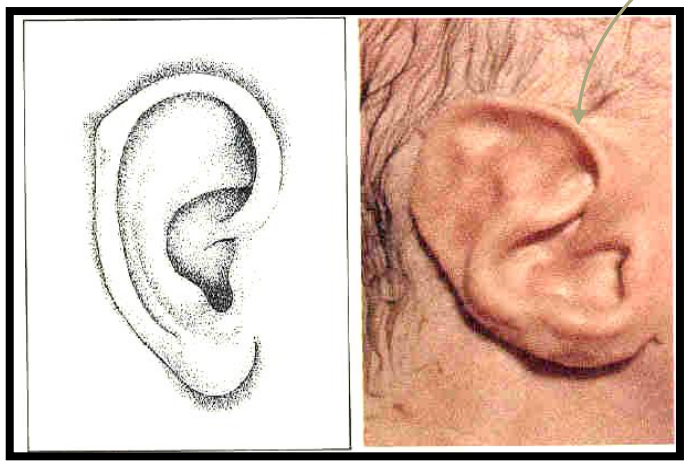
- Top of ears parallel to inner and outer canthus of eyes
- Well formed, firm cartilage with good recoil
- Responds to voice and sounds
- Hearing screen passed bilaterally

(DAVIDSON ET AL., 2020; LOWDERMILK ET AL., 2024; STANFORD MEDICINE, 2017)

EARS – VARIATIONS

Normal Variations:

- Small, large and/or floppy
- Darwin tubercle (nodule on posterior helix)
- Temporary asymmetry (intrauterine position)



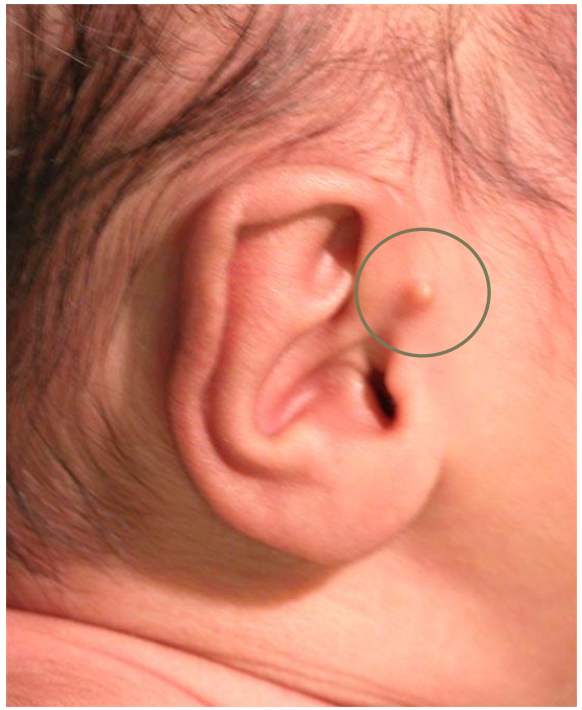
Abnormal Variations:

- Size overly prominent or protruding
- Lack of cartilage (preterm)
- Low placement (chromosomal disorder – trisomy 13, 18, 21, kidney disorder)
- Preauricular tag or sinus/pit (Brachio-Oto-Renal Syndrome)
- No response to sound stimuli
- Referred hearing screen

(DAVIDSON ET AL., 2020; LOWDERMILK ET AL., 2024)

EARS – VARIATIONS

Ear Tag



Ear Pit

Low Set

(LOWDERMILK ET AL., 2024; STANFORD MEDICINE, 2017)

NOSE – NORMAL

- Symmetrical in size and shape
- Evenly placed between eyes and mouth
- Midline
- Patent nares
- Nose breathers
- Responds to odors
- Sneezing to clear nasal passages

(DAVIDSON ET AL., 2020)

NOSE– VARIATIONS

Normal Variations:

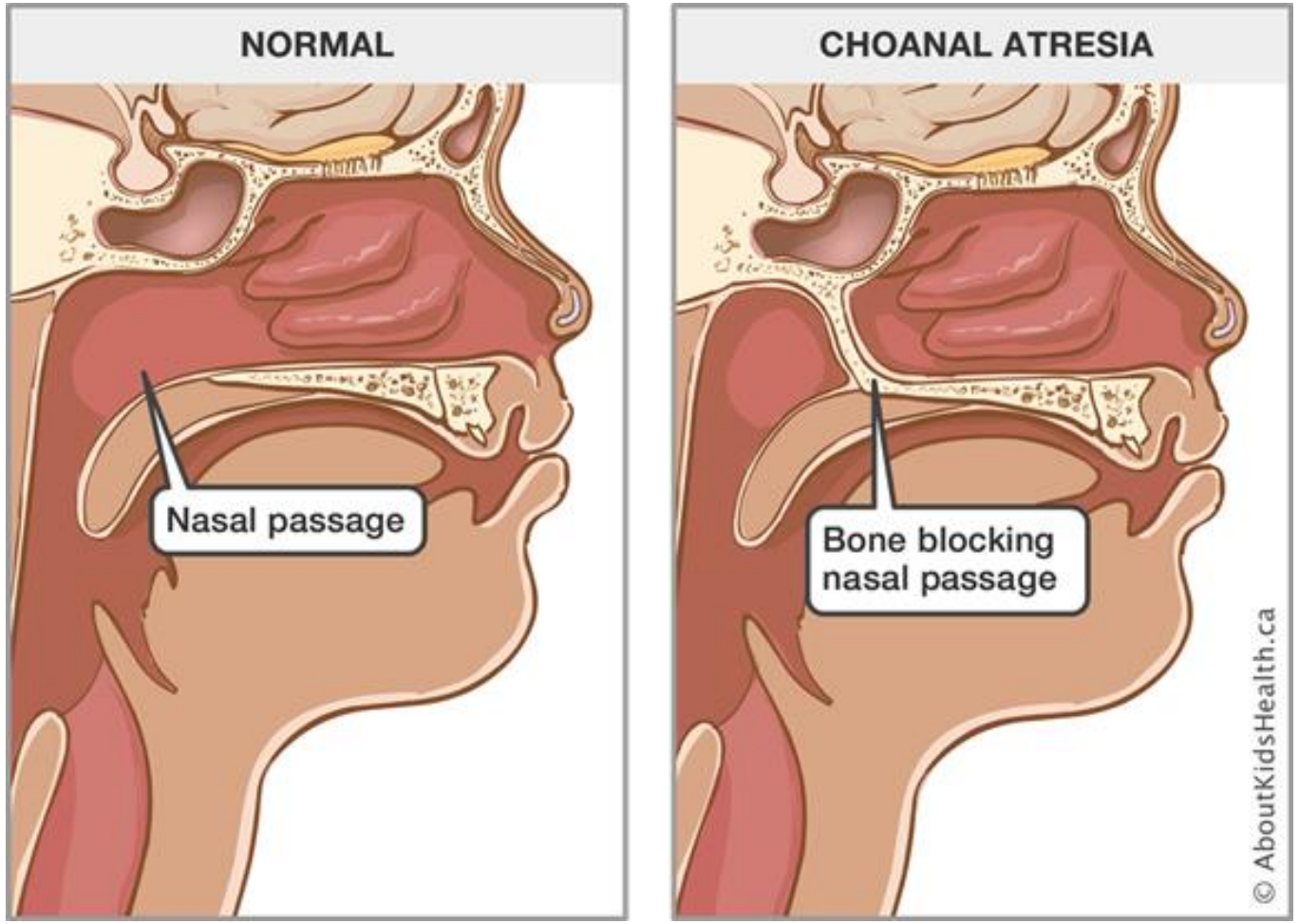
- Slight deformity – flattened, misshapen or deviated to one side

Abnormal Variations:

- Copious drainage
- Blockage of nares, choanal atresia
- Malformed (congenital syphilis, chromosomal disorder)
- Flat nasal bridge
- Deviated nasal septum
- Absent response to stimulating odor
- Persistent sneezing (NAS)

(DAVIDSON ET AL., 2020)

NOSE - CHOANAL ATRESIA



NOSE – VARIATIONS

Positional Deformity

Deviated Nasal Septum

(STANFORD MEDICINE, 2017)

MOUTH – NORMAL

- Lips are pink, equal on both sides of midline
- Symmetrical movement
- Mucous membranes pink, moist, and intact
- Tongue:
  - Pink, intact, symmetric in shape, and moves freely
  - Proportional to mouth
- Soft and hard palates intact
- Distinct chin
- Suck, root, gag reflexes present

(DAVIDSON ET AL., 2020; STANFORD MEDICINE, 2017)

MOUTH– NORMAL VARIATIONS

- Sucking blisters
- Epstein pearls
- Bohn's nodules
- Ankyloglossia (tongue tie/short frenulum)
- Reflex response dependent on alert state and hunger

(DAVIDSON ET AL., 2020; LOWDERMILK ET AL., 2024)

MOUTH– ABNORMAL VARIATIONS

- Gross anomalies in placement, size, shape
- Dry or cyanotic mucous membranes
- Asymmetry in movement of lips (7th cranial nerve paralysis)
- Weak, uncoordinated suck/swallow (prematurity, neurological disorder, maternal analgesia)
- Teeth (hereditary)
- Macroglossia (chromosomal disorder)
- Coated tongue (Candida albicans, ankyloglossia)
- Recessed/undersized chin (Micrognathia)
- Excessive salivation w/choking or turning cyanotic (esophageal atresia, tracheoesophageal fistula)
- Absent reflexes

(DAVIDSON ET AL., 2020; LOWDERMILK ET AL., 2024)

MOUTH – VARIATIONS

Epstein Pearls

Bohn's Nodule

(STANFORD MEDICINE, 2017)

MOUTH – VARIATIONS

Ankyloglossia

Micrognathia

(STANFORD MEDICINE, 2017)

MOUTH – VARIATIONS

Cleft Lip

Cleft Palate

(STANFORD MEDICINE, 2017)

NECK – NORMAL

- Short, straight, and creased with skin folds
- Head held midline
- Neck moves freely
- Full range of motion
- Moro reflex intact bilaterally
- Clavicles are smooth, straight, and intact
- Symmetric shoulders

(DAVIDSON ET AL., 2020; LOWDERMILK ET AL., 2024)

NECK– VARIATIONS

- Abnormally short neck (Turner syndrome)
- Webbing (Turner syndrome, trisomy 21, trisomy 18)
- Restricted movement, inability to flex neck (congenital anomaly)
- Head held at angle/asymmetrical (torticollis)
- Absence of head control (preterm, trisomy 21, hypotonia)
- Knot, lump, crepitus over clavicular area (fracture)
- Unilateral moro reflex (fracture, brachial palsy, Erb-Duchenne paralysis)

(DAVIDSON ET AL., 2020)

NECK – VARIATIONS

Torticollis

Webbing

Clavicle Fracture

(STANFORD MEDICINE, 2017; HTTP://WWW.KASSISMITHDPT.COM/NEW-BLOG/2016/8/22/TORTICOLLIS-AND-PLAGIOCEPHALY-WHATS-THE-LATEST)

CHEST – NORMAL

- Round or barrel shaped
- Moves in a symmetrical motion with each breath
- Absence of retractions
- Xiphoid process may protrude for several weeks after birth
- Nipples prominent, well formed, and symmetrically placed

(DAVIDSON ET AL., 2020)

CHEST – VARIATIONS

Normal Variations:

- Occasional retractions when crying (absence of respiratory distress)
- Hypertrophy of breast tissue (breast buds) r/t maternal hormones
- Lack of breast tissue (preterm)
- Supernumerary nipple
- Skin tag

Abnormal Variations:

- Bulging of chest (Diaphragmatic hernia)
- Unequal movement (pneumothorax, pneumonia, respiratory distress)
- Retractions, seesaw respirations
- Decreased breath sounds (atelectasis, pneumothorax)
- Malpositioned or widely spaced nipples

(DAVIDSON ET AL., 2020; LOWDERMILK ET AL., 2024)

CHEST – VARIATIONS

Bulging/Asymmetry

Prominent Xiphoid Process

(STANFORD MEDICINE, 2017)

CHEST – VARIATIONS

Supernumerary Nipple

Skin Tag

(STANFORD MEDICINE, 2017)

ABDOMEN

Normal:

- Rounded, dome shaped, symmetric
- Soft
- Bowel sounds present in all 4 quadrants

Normal Variations:

- Reducible umbilical hernia
- Diastasis recti
- Linea nigra
- Abdomen may appear distended in premature infants r/t lack of muscle tone

(DAVIDSON ET AL., 2020; LOWDERMILK ET AL., 2024)

ABDOMEN– ABNORMAL VARIATIONS

- Distention, shiny with engorged vessels (GI abnormalities, infections, congenital megacolon)
- Distention (obstruction, anorectal malformation, anal stenosis)
- Absent bowel sounds
- Bowel sounds in chest (diaphragmatic hernia)
- Increased/decreased peristalsis (duodenal stenosis, obstruction)
- Scaphoid/sunken abdomen (diaphragmatic hernia)
- Decreased/absent abdominal movement with breathing (phrenic nerve palsy, congenital diaphragmatic hernia)
- Localized flank bulging (enlarged kidneys, ascites, absent abdominal muscles)
- Omphalocele
- Gastrochisis

(DAVIDSON ET AL., 2020)

ABDOMEN– UMBILICAL CORD

Normal:

- 2 arteries and 1 vein
- White and gelatinous after birth, clamped and drying
- Definite differentiation between cord and skin (no intestinal structures within cord)
- Pink and dry around base
- Odorless

Abnormal Variations:

- 1 artery (congenital/renal anomaly)
- Bleeding or oozing around cord (hemorrhagic disease)
- Redness or exudate around cord (omphalitis/infection)
- Yellow discoloration (hemolytic disease, meconium staining)
- Umbilical hernia

(DAVIDSON ET AL., 2020; LOWDERMILK ET AL., 2024)

ABDOMEN – NORMAL

3 Vessel Cord

Round, Symmetric

(STANFORD MEDICINE, 2017)

ABDOMEN – VARIATIONS

Umbilical hernia

Umbilical hematoma

(STANFORD MEDICINE, 2017)

ABDOMEN – VARIATIONS

Omphalitis

Skin irritation (from dry cord)

(STANFORD MEDICINE, 2017)

ABDOMEN – VARIATIONS

Diastasis Recti

Linea Nigra

(STANFORD MEDICINE, 2017)

GENITOURINARY

Urination - Normal

- Straw to amber colored urine
- Void within first 24 hours of life
- First 2 days of life – 2-6 voids/24 hours
- By day 5, ≥ 6 or more voids/24 hours

Normal Variations:

- Rust colored urine (uric acid crystals)

Abnormal Variations:

- No void in first 24 hours of life
  - Renal agenesis
  - Potter syndrome

(LOWDERMILK ET AL., 2024)

FEMALE GENITOURINARY – NORMAL

- Size of labia majora, labia minora, and clitoris appropriate for gestation age
- Labia majora covers minora in term infants
- Large clitoris
- White, mucous discharge
- Hymenal or vaginal tag

(DAVIDSON ET AL., 2020; LOWDERMILK ET AL, 2024)

FEMALE GENITOURINARY– VARIATIONS

Normal Variations:

- Increased pigmentation
- Pseudomenstration
- Edema/ecchymosis
- Vernix between labia

Abnormal Variations:

- Ambiguous genitalia/hypertrophy of clitoris
- Prominent labia minora (preterm)
- Absence of vaginal orifice (congenital anomaly)
- Fecal discharge (fistula)

(DAVIDSON ET AL., 2020)

FEMALE GENITOURINARY – VARIATIONS

Ambiguous genitalia

Vaginal mass with hymenal tag

(STANFORD MEDICINE, 2017)

MALE GENITOURINARY – NORMAL

- Foreskin covering glans (if uncircumcised)
- Urinary meatus at the tip of penis
- Scrotum is large, edematous, pendulous, and covered in rugae (wrinkles) in term infants
- Both testes descended, may be palpable

Normal Variations:

- Increased size and pigmentation
- Scrotal edema and ecchymosis
- Bulge palpable in inguinal canal
- Scrotum smooth, testes undescended (preterm)

(DAVIDSON ET AL., 2020; LOWDERMILK ET AL., 2024)

MALE GENITOURINARY – ABNORMAL VARIATIONS

- Ambiguous genitalia
- Micropenis (congenital anomaly)
- Urinary meatus not on tip
  - Hypospadias (ventral)
  - Epispadias (dorsal)
- Cordee
- Penile torsion
- Hydrocele
- Testicular torsion (discolored/dusky scrotum, hard upon palpation)

(DAVIDSON ET AL., 2020; LOWDERMILK ET AL., 2024)

MALE GENITOURINARY– VARIATIONS

Hypospadias

Epispadias

(STANFORD MEDICINE, 2017)

MALE GENITOURINARY– VARIATIONS

Chordee

Penile Torsion

(STANFORD MEDICINE, 2017)

MALE GENITOURINARY– VARIATIONS

Hydrocele

Testicular Torsion

(STANFORD MEDICINE, 2017)

PERIANAL

Normal:

- One anus
- Patent
- Anal "wink" present
- Passage of meconium w/in 24-48 hours
- No fissures, tears, or skin tags

Abnormal Variations:

- Imperforate anus (congenital GI defect)
- Rectal atresia and stenosis
- No stool (bowel obstruction)
- Frequent watery stools (infection, phototherapy)

(DAVIDSON ET AL., 2020; LOWDERMILK ET AL., 2024)

EXTREMITIES

Normal:

- Attitude of flexion
- Full ROM and spontaneous movements
- Equal in length and bilateral in movement

Abnormal Variations:

- Movement asymmetrical, unilateral or absent (spinal cord, fracture, nerve trauma)
- Limp (CNS problems, hypoglycemia)
- Spastic muscle movements (cerebral palsy)
- Hypotonia (preterm, CNS abnormality, trisomy 21)
- Shortened leg (dislocated hip)

(DAVIDSON ET AL., 2020; LOWDERMILK ET AL., 2024)

HANDS/FEET

Normal:

- Normal number fingers/toes
- Palmar creases
- Foot in straight line
- Fat pads/creases on soles of feet
- Feet appear to be turned inward but are easily rotated externally

Abnormal Variations:

- Polydactyly
- Syndactyly
- Simian crease (Trisomy 21)
- Cyanosis/clubbing of finger nails (cardiac anomaly)
- Clubfoot
- Incomplete sole creases (preterm)

(DAVIDSON ET AL., 2020)

EXTREMITIES – VARIATIONS

Normal Crease

Simian Crease

(STANFORD MEDICINE, 2017)

EXTREMITIES – VARIATIONS

Polydactyly

Syndactyly

(STANFORD MEDICINE, 2017)

EXTREMITIES – VARIATIONS

Positional deformity

Club foot

(STANFORD MEDICINE, 2017)

BACK – NORMAL

- Able to support head at 45 degree angle with back straight while in ventral suspension position
- C shaped spine
- Spine easily flexed when touched
- Symmetrical alignment of shoulders, scapulae, iliac crests, gluteal folds
- Base of spine intact

(DAVIDSON ET AL., 2020; LOWDERMILK ET AL., 2024)

BACK– ABNORMAL VARIATIONS

- Limitation of movement
- Meningocele, myelomeningocele (Spina bifida)
- Pigmented nevus or tuft of hair (spina bifida)
- Pilonidal/sacral dimple
- Sinus
- Head lag, limp, floppy trunk (neurologic)
- Abnormal hip movement, jerk, or snap (dislocated hips)
- Asymmetry (dislocated hips)

(DAVIDSON ET AL., 2020; LOWDERMILK ET AL., 2024)

EXTREMITIES – VARIATIONS

Sacral dimple

Tuft of hair along spine

(STANFORD MEDICINE, 2017)

HTTPS://WWW.RESEARCHGATE.NET/PUBLICATION/6227938_SPINAL_SONOGRAPHY_IN_INFANTS_WITH_CUTANEOUS_BIRTH_MARKERS_IN_THE_LUMBO-SACRAL_REGION_-_AN_IMPORTANT_SIGN_OF_OCCULT_SPINAL_DYSRHAPHISM_AND_TETHERED_CORD

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