



HEALTH HOLDING

HAFER ALBATIN HEALTH
CLUSTER
MATERNITY AND
CHILDREN HOSPITAL

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| Department: | Neonatal Intensive Care Unit (NICU) | | |
| Document: | Departmental Policy and Procedure | | |
| Title: | Physical Examination of Neonates | | |
| Applies To: | All NICU Staff | | |
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1. PURPOSE:

- 1.1 Perform physical examination on all neonates in the MCH departments.
- 1.2 Detect any physical abnormalities to be able to provide earlier management.

2. DEFINITIONS:

- 2.1 A complete physical examination is an important part of newborn care. Each body system is carefully examined for signs of health and normal function.

3. POLICY:

- 3.1 Physical examination is only one part of patient assessment. It should be done with full medical and family history, assessment of nutritional, social and rehabilitation status, in addition to psychological and economic status of parents/patient guardians.
- 3.2 Newborn's are examined by physician at different periods including:
 - 3.2.1 A brief examination immediately after birth.
 - 3.2.2 A complete examination in the well-baby unit or mother's room within a maximum of 24 hours after birth and upon admission for admitted patients.
 - 3.2.3 Within 12 hours before discharge.
 - 3.2.4 As part of daily and as needed reassessment.
- 3.3 Before embarking on the physical examination, review the mother's medical and pregnancy history to help focus the examination and to ensure that no pertinent findings are over-looked.
- 3.4 Assess newborn for any potential problems related to maternal pregnancy history or familial disorders.
- 3.5 Provide appropriate plan of care for any antenatally or postnatally detected abnormalities.
- 3.6 Determine whether there is concern about the adequacy of parental care of the baby following discharge.
- 3.7 Use international standardized terms whenever applicable to describe any detected abnormalities.

4. PROCEDURE:

- 4.1 Obtain thorough history that includes:
 - 4.1.1 Maternal present and past medical history, diabetes mellitus, hypertension, hemorrhagic disease.
 - 4.1.2 History of pregnancy: Parity, any illness during pregnancy, medications taken. allergies, poly/ oligohydramnios, results of ultrasound or biophysical profile and date done during pregnancy, blood type and Rh, serology results, hepatitis B and group B Streptococci status, evidence of chorioamnionitis.
 - 4.1.3 History of delivery; its method and duration, results of Continuous Cardio-Tocography (CTG), method and duration of rupture of membranes & presence or absence of meconium in amniotic fluid, generic name and number of doses of glucocorticoids and antibiotic therapy given during labor.
 - 4.1.4 Family history of hereditary disease or previous neonatal or siblings death or exchange transfusion, child abuse, consanguinity, psychological. nutritional, rehabilitation and social and

- economic status.
- 4.2 Physical examination after birth in the delivery/operating rooms:
 - 4.2.1 Evaluate responsiveness and muscle tone as further indicator of the success of transition and well-being of the infant. Flaccidity, hypertonicity, or asymmetry of tone is abnormal.
 - 4.2.2 Survey the head, face, mouth, ears, abdomen, back, extremities, genitalia, and perineum.
 - 4.2.3 After this initial brief assessment, if the condition of the baby and mother permits, provide baby and parents some private time. The baby is usually in a state of quiet alertness, facilitating parent-infant bonding and increasing the likelihood of breast feeding success.
 - 4.2.4 During the transitional period (first 6-12 hours of life), the assigned nurse will briefly assess the general condition of the infant and vital signs once every 30 minutes for 2 hours then every 2 hours and as required for the first 12 hours.
 - 4.3 Perform complete head to toe physical examination:
 - 4.3.1 General observation (hands and stethoscope off) is combined with a head-to-toe review; preferably when the infant is calm e.g. look for skin color, integrity and perfusion, state of alertness, activity, range of spontaneous movement posture, muscle tone, cleft lip.
 - 4.3.2 Estimate gestational age by Ballard score.
 - 4.3.3 Assess appropriateness of weight, length, and head circumference for gestational age and document it on the growth chart.
 - 4.3.4 Assess vital signs. The following are acceptable ranges:
 - 4.3.4.1 Temperature normal ranges:
 - 4.3.4.1.1 Axillary (screening): 36.5°C to 37.4°C (97.8°F to 99.5°F).
 - 4.3.4.1.2 Rectal (definitive): 36.6°C to 37.9°C (97.9°F to 100.3°F).
 - 4.3.4.2 Pulse rate: 110-160 / minute. A low resting heart rate caused by sinus bradycardia (80 to 100 beats/min) during sleep is common in healthy full-term infants (verify good acceleration with stimulation and normal blood pressure).
 - 4.3.4.3 Respiratory rate: 40-60 /minute.
 - 4.3.4.4 Blood pressure: Varies with gestational age and postnatal age.
 - 4.3.5 **Skull**
 - 4.3.5.1 Circumference: The fronto-occipital head circumference (FOC) should be measured at its maximum. Pass the measuring tape just above the eyebrows and around the prominent posterior aspect of the head. Normal head circumference is 33-35cm.
 - 4.3.5.2 Shape, symmetry by looking at the infant's head from above.
 - 4.3.5.3 Sutures: overriding (molding), normal, widely open, ridges for craniosynostosis,
 - 4.3.5.4 Fontanels: Anterior fontanel is diamond shaped 2-3 - 3-4 cms. Size is calculated by the average of anteroposterior and transverse diameters. The average size is 2.1 cm. Posterior fontanel is triangular 0.5 – 1 cm.
 - 4.3.5.5 Look for caput succedaneum, cephalhematoma, subgaleal bleed.
 - 4.3.6 **Face**
 - 4.3.6.1 Gain an overall impression of the facial appearance. Sometimes, an overall gestalt can be diagnostic (e.g. Down syndrome).
 - 4.3.6.2 Divide the face into sections to examine it thoroughly: forehead, midface and oral region.
 - 4.3.6.3 It is important to view the face from the front and from the lateral view e.g. the depth or height of structures such as the nasal bridge, the position of the mandible relative to the maxilla and the development of the midface (maxilla {upper jaw} and zygoma) are best assessed by the lateral view.
 - 4.3.6.4 Face shape: Examine the overall face shape, symmetry and facial muscle movement.
 - 4.3.6.5 Forehead: assess: Forehead shape; prominent, bossing, broad, tall
 - 4.3.6.6 Milia are tiny epidermal inclusion cysts, seen on the face and scalp in small numbers, are smooth, firm, white papules with no associated erythema. May be present at birth or appear later or resolve within few months.
 - 4.3.7 **Eyes: (holding the infant upright and rocking backward and forward often prompts the baby to open his/her eyes)**

- 4.3.7.1 Note the spacing and size of eyes: space between the inner and outer canthus of one eye approximates the width between the two inner canthi.
- 4.3.7.2 Observe for eyelashes and eyebrows.
- 4.3.7.3 Inspect the conjunctiva: exudates, jaundice, hemorrhage, color.
- 4.3.7.4 Red reflex: look into the pupil while using the ophthalmoscope to see a clear red color. No reflection back may be indicative of a retinal hemorrhage; whitish color may indicate retinoblastoma.
- 4.3.7.5 Cornea: observe for any cloudiness.
- 4.3.7.6 Iris: Color of both eyes: normal color of neonates is typically blue or bluish-gray in light-skinned babies and can be darker gray or brown in infants with darker skin.
- 4.3.7.7 Pupils: shape, color, equal and reactive pupillary reflex; Pupil reaction to light begins to appear by 30 weeks of gestation, but reaction may not be consistently seen for another 2 to 5 weeks.
- 4.3.7.8 Sclera: Normally white and clear, Color blue in certain syndrome.
- 4.3.7.9 Proptosis: assess from lateral view: protuberant vs deep set globes.
- 4.3.7.10 Nystagmus is a repetitive, involuntary, rhythmic movement of the eye in a particular direction.
- 4.3.7.11 Strabismus: In most premature and some full-term infants, the eyes are slightly disconjugate at rest, with one or the other 1 to 2 mm out.
- 4.3.8 **Mid-facial Region: Assess the development of the maxilla and zygoma (cheekbone), nose and ears**
- 4.3.9 **Nose:**
 - 4.3.9.1 Observe shape and size; may have positional deformities or abnormal shape associated with congenital syndromes.
 - 4.3.9.2 Check patency of nares if choanal atresia is suggested.
 - 4.3.9.3 Observe for flaring of the alae nasi: indicated increased work of breathing.
- 4.3.10 **Ears:**
 - 4.3.10.1 Size: Macrocia, microtia, anotia.
 - 4.3.10.2 Shape and structure: Variations of the individual anatomical parts.
 - 4.3.10.3 Position: Variation in position (low set ears and posterior angulation of the ear). Low set ears - Upper insertion of the ear to the scalp below an imaginary horizontal passing through the inner canthi and extend that line posteriorly to the ear.
- 4.3.11 **Mouth:**
 - 4.3.11.1 Observe the size and shape of the mouth.
 - 4.3.11.2 Microstomia: trisomy 18 and 21.
 - 4.3.11.3 Macrostomia: mucopolysacchaidoses.
 - 4.3.11.4 Fish mouth: fetal alcohol syndrome.
 - 4.3.11.5 Epstein pearls: small white cysts that contain keratin, found on either side of the median raphe of the palate.
 - 4.3.11.6 Ranulas: small bluish white swellings of variable size on the floor of the mouth that are benign mucous gland retention cysts.
 - 4.3.11.7 Tongue: look for macroglossia.
 - 4.3.11.8 Natal teeth: risk of aspiration if loosely attached. Consult with pediatric dentistry as the teeth may be permanent teeth.
- 4.3.12 **Jaw position**
 - 4.3.12.1 Micrognathia: Apparently reduced length and width of the mandible when viewed from the front but not from the side.
 - 4.3.12.2 Retrognathia: Posteriorly positioned lower jaw, which is set back from the plane of the face when viewed from the side but not from the front.
 - 4.3.12.3 Microretrognathia: in which micrognathia is accompanied with retrognathia.
- 4.3.13 **Neck:**
 - 4.3.13.1 Palpate sternocleidomastoid muscle for masses such as cystic hygromas.
 - 4.3.13.2 Evaluate the range of motion of the head and neck. Visualize the skin surface of the neck and palpate, while turning the head and retracting the skin to open the neck

creases and folds. Congenital muscular torticollis at birth is commonly accompanied by a palpable fibrous tumor in the shortened sternocleidomastoid muscle.

- 4.3.13.3 Look for short neck or low hairline.
- 4.3.13.4 Redundant skin may be seen in Trisomy 21 and webbed neck in Turner syndrome.
- 4.3.13.5 Palpate clavicles for possible fractures.
- 4.3.13.6 If the larynx or trachea are displaced from the midline.
- 4.3.13.7 Enlargement of the thyroid gland.
- 4.3.14 **Chest wall:**
 - 4.3.14.1 Evaluate the skin, soft tissue, and bony structures of the thorax.
 - 4.3.14.2 A small bell-shaped chest in an infant with respiratory distress may reflect lung hypoplasia or a disorder of skeletal growth.
 - 4.3.14.3 An increase in the anterior-posterior diameter of the chest (barrel chest) may reflect an increase in the intrathoracic volume caused by air trapping from meconium aspiration or Pneumothorax.
 - 4.3.14.4 Note the position of the nipples, presence of any accessory nipples.
 - 4.3.14.6 A prominent or bifid xiphoid is benign.
 - 4.3.14.7 A mildly depressed sternum (pectus excavatum) or protuberant one (pectus carinatum) is usually of no clinical consequence.
- 4.3.15 **Lungs and respiration:**
 - 4.3.15.1 Observe respiratory rate. Normal is 40-60 breaths / minute. Accurate rate requires counting for a full minute.
 - 4.3.15.2 Assess the quality and vigor of vocalization during crying; cyanosis that resolves during crying may be due to choanal atresia or stenosis, apnea, or hypoventilation.
 - 4.3.15.3 Observe chest movements for symmetry and increased work of breathing.
 - 4.3.15.4 Auscultate breath sounds and note pattern of air entry.
 - 4.3.15.5 Note presence of stridor, grunting, wheezing, fine/ coarse rales.
 - 4.3.15.6 Stridor during crying in an infant with no respiratory distress when quiet is often due to tracheolaryngomalacia.
 - 4.3.15.7 Stridor that is present during quiet breathing or present during both inspiration and expiration suggests the presence of a more significant airway obstruction that requires further evaluation.
- 4.3.16 **Cardiovascular:**
 - 4.3.16.1 Obtain heart rate and note rhythm. Normal is 110-160 beats/ minute.
 - 4.3.16.2 Examine the precordial area and heart (by inspection, palpation, and auscultation), pulses, temperature, color and perfusion of all regions of the body and oxygen saturation.
 - 4.3.16.3 Determine if heart is on the left or right side; point of maximal impulse and auscultation.
 - 4.3.16.4 Observe breathing; central cyanosis accompanied by a comfortable respiratory effort is suggestive of a structural heart defect with diminished pulmonary blood flow.
 - 4.3.16.5 Auscultate heart sounds for presence of murmurs, clicks and rubs.
 - 4.3.16.6 Check capillary refill centrally and peripherally.
 - 4.3.16.7 Innocent murmurs noted during first few days of life of otherwise well newborn are soft, systolic, at the left sternal edge or pulmonary area are transient and related to ongoing circulatory adaptation.
 - 4.3.16.8 Palpate both femoral pulses. The femoral pulses are diminished in coarctation of the aorta, but may initially be palpable if blood flow is maintained by right to left shunting across the ductus arteriosus.
 - 4.3.16.9 If femoral are decreased or a delay of the femoral relative to the brachial pulses is detected, measure the blood pressure in all four extremities.
 - 4.3.16.10 A systolic BP that is more than 10 mmHg higher in the upper compared to the lower limbs is abnormal and suggests aortic arch abnormality.

- 4.3.16.11 A gradient of 10% or more in oxygen saturation between simultaneous preductal (right upper extremity) and post-ductal (lower extremity) suggests ductus arteriosus right to left shunt and PPHN.
- 4.3.17 **Abdomen:**
- 4.3.17.1 Note the shape of the abdomen in relation to the thorax. Flat indicates decreased tone or abnormalities in the abdominal musculature. Scaphoid indicates abdominal contents in chest.
- 4.3.17.2 Note the presence/ absence of bowel sounds in all quadrants and the presence of abdominal distension.
- 4.3.17.3 Observe for diastasis recti.
- 4.3.17.4 Observe for any malformations: omphalocele, gastrochisis
- 4.3.17.5 Examine the umbilical cord for amount of Wharton's jelly and count the blood vessels.
- 4.3.17.6 Palpate the liver. Normal position is 1-2 cm below the right costal margin.
- 4.3.17.7 Palpate for spleen. Normally it is not palpable. If detected, investigate for congenital infection or extramedullary hematopoiesis.
- 4.3.17.8 Palpate the abdomen for the presence of masses or tenderness.
- 4.3.17.9 Examine for umbilicus and inguinal hernias.
- 4.3.17.10 Inspect anal area for patency and presence of fistulas.
- 4.3.18 **Genitalia: Males:**
- 4.3.18.1 Assess the penile size, position of the meatus, appearance of the scrotum, and position of the testes.
- 4.3.18.2 A penis of the term infant stretched along its length until resistance is met should be at least 2.5 cm long.
- 4.3.18.3 Hypospadias is relatively common. It is a congenital anomaly of the male urethra that results in abnormal ventral placement of the urethral opening. The location of the meatus may range anywhere within the glans, the shaft of penis, the scrotum, or perineum. Advise parents that circumcision is not recommended, because the preputial skin may be necessary for hypospadias repair. Consult pediatric urology.
- 4.3.18.4 Far less common is an epispadias, in which the meatus is present on the dorsal surface of the penis, more often being associated with exstrophy of the bladder.
- 4.3.18.5 The testes should be palpable in the scrotum of the term infant.
- 4.3.18.6 Distinguish a hydrocele from a hernia by a combination of palpation and transillumination.
- 4.3.18.7 Testicular torsion that occurred prenatally presents with a firm, non-tender testicle with discoloration of the scrotum. Size of the testicle will vary, depending on the extent of atrophy that has occurred prior to birth.
- 4.3.18.8 Postnatal torsion presents with acute tenderness and swelling in a testicle that was previously noted to be normal on examination.
- 4.3.19 **Genitalia Females:**
- 4.3.19.1 The premature infant has a prominent clitoris and labia minora whereas in the term infant, the labia majora completely cover these structures.
- 4.3.19.2 In the term female, out pouching of the vaginal mucosa (vaginal skin tags) is often seen at the posterior fourchette, these are inconsequential and regress within a few weeks.
- 4.3.19.3 A mucous vaginal discharge, which is at times bloody, is often seen.
- 4.3.19.4 A completely imperforate hymen may result in the development of hydrometrocolpos, the bulging hymen is particularly prominent with crying.
- 4.3.19.5 A mass in the labia or groin may be a hernia but consider the possibility of an ectopic gonad, which may be either an ovary or a testis.
- 4.3.20 **Ambiguous genitalia:**
- 4.3.20.1 Physical findings of ambiguous genitalia in a phenotypic female e.g. enlarged clitoris, fused labial folds, or palpable gonads; and in a phenotypic male, bifid scrotum, severe hypospadias, micropenis, or cryptorchidism.

- 4.3.20.2 Ambiguous genitalia may signal an intersex disorder or congenital adrenal hyperplasia (CAH).
- 4.3.21 **Anus:**
 - 4.3.21.1 Examine the anus carefully for patency and location.
 - 4.3.21.2 If absent or imperforate, consider possibility of (VATER) or VACTERL association: Vertebral defects, Anal defects, Cardiac defects, Tracheoesophageal atresia, Renal defects, and Limbs defects).
 - 4.3.21.3 Look for anal fistula: Stools may pass through a fistula which can be anterior or posterior.
- 4.4 **Hips:**
 - 4.4.1 Examination of the hips must be done for all neonates to detect developmental dysplasia of the hip (DDH).
- 4.5 **The Extremities; look for:**
 - 4.5.1 Limb shortening.
 - 4.5.2 Joint range of movement, contractures, asymmetries, or dislocations.
 - 4.5.3 True equinovarus deformities e.g. talipes equinovarus. Differentiate variations caused by intrauterine positioning of the foot by the presence of a normal range of motion and ability to establish a normal position and appearance of the foot with gentle pressure.
 - 4.5.4 Erb's palsy.
 - 4.5.5 Fractured bones.
 - 4.5.6 Shape and size of hands and feet.
 - 4.5.7 Abnormalities of the digits (shortening, tapering, syndactyly, polydactyl, clinodactyly), single palmar creases, nail hypoplasia.
- 4.6 **The Back: visualize and palpate the spines for:**
 - 4.6.1 Length, kyphosis, scoliosis, soft tissue masses along the spine that are covered with normal skin may be lipomas or myelomeningocele.
 - 4.6.2 Evidence of an abnormality overlying the spine e.g. hair tuft, hemangioma, aplasia cutis, skin tag raise the possibility of an underlying occult spinal dysraphic state.
 - 4.6.3 Separate the gluteal folds to determine whether a sacral cleft or dimple is present.
- 4.7 **Skin, nails and hair:**
 - 4.7.1 Look for skin color, perfusion, hydration, bruise/ecchymosis, lacerations, petechiae, rashes, skin tags, pits, congenital nevi, areas of abnormal pigmentation, hemangiomas, unusual scaling, blistering, abnormal laxity, or dysplasia.
 - 4.7.2 Erythema toxicum neonatorum is a benign rash, seen in term infants, can be present at birth, but in most cases, it is first seen at the age of 1 to 2 days. It is 1 - 2 mm white papules (that may become vesicular) on an erythematous base of varying diameter (1-3 cm). The lesions can appear anywhere on the body, but are never found on the palms or soles. They contain numerous eosinophils.
 - 4.7.3 Miliaria is a result of superficial obstruction of sweat ducts, manifests as small, crystal-clear vesicles that resemble water droplets over the forehead and on the scalp and skinfolds.
 - 4.7.4 Transient neonatal pustular melanosis; is a self-limited process with lesions.
 - 4.7.5 Look for nail hypoplasia, dysplasia, aplasia, or hypertrophy.
- 4.8 Examine siblings and or parents if needed to determine whether dysmorphic features noted are familial or syndromic.

5. MATERIAL AND EQUIPMENT:

- 5.1 Weighing scale
- 5.2 None stretchable measuring tape
- 5.3 Stethoscope
- 5.4 Light source
- 5.5 Ophthalmoscope
- 5.6 Thermometer and temperature probe
- 5.7 Cardiac monitor

5.8 Saturation probe

6. RESPONSIBILITIES:

- 6.1 Physician / residents
- 6.2 Neonatology staff nurse








7. APPENDICES:

N/A

8. REFERENCES:

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- 8.4 Lissauer T et al. Size and Physical Examination of the Newborn Infant. Klaus and Fanaroff's Care of the high-risk neonate. 6th edition. 2013

9. APPROVALS:

| | Name | Title | Signature | Date |
|--------------|---------------------------------|-----------------------------|---|------------------|
| Prepared by: | Ms. Afrah Saud Al Shammari | NICU Head Nurse |  | January 05, 2025 |
| Prepared by: | Dr. Falah Nabhan Al Shammari | NICU Quality Coordinator |  | January 05, 2025 |
| Reviewed by: | Mr. Sabah Turayhib Al - Harbi | Director of Nursing |  | January 07, 2025 |
| Reviewed by: | Dr. Sarhan Hamdan Al Shammari | NICU Head of the Department |  | January 08, 2025 |
| Reviewed by: | Mr. Abdullellah Ayed Al Mutairi | QM&PS Director |  | January 09, 2025 |
| Reviewed by: | Dr. Tamer Mohamed Naguib | Medical Director |  | January 12, 2025 |
| Approved by: | Mr. Fahad Hazam Al - Shammari | Hospital Director |  | January 19, 2025 |