The Newborn Exam and Congenital Anomalies

MANGO Study Nurse Training Course
MANGO Study – Congenital Anomalies Training

- Objectives:
  - To improve nurses' skills in conducting complete newborn physical examinations.
  - To improve nurses' knowledge of the types of external newborn congenital anomalies.
  - To improve nurses' ability to identify both major and minor external newborn congenital anomalies and reporting/documentation of occurrence of congenital anomalies.
Classification

- Classification by Gestational Age
  - Preterm < 37 wks
  - Full term 37-40 Postterm > 42 Wks

- Classification By Birth Weight
  - Low Birth Weight < 2500 g
    - Very Low birth weight < 1500 g
  - Extreme low birth weight < 1000 g

- Classification By Weight Percentiles
  - AGA 10th-90th percentile for GA
  - SGA < 10th percentile for GA
  - LGA > 90th percentile for GA
expanded APGAR SCORE

The Apgar score rates:
- Respiration, crying
- Reflexes, irritability
- Pulse, heart rate
- Skin color of body and extremities
- Muscle tone

<table>
<thead>
<tr>
<th>Sign</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>Blue or Pale</td>
<td>Acrocyanotic</td>
<td>Completely Pink</td>
</tr>
<tr>
<td>Heart rate</td>
<td>Absent</td>
<td>&lt;100 minute</td>
<td>&gt;100 minute</td>
</tr>
<tr>
<td>Reflex irritability</td>
<td>No Response</td>
<td>Grimace</td>
<td>Cry or Active Withdrawal</td>
</tr>
<tr>
<td>Muscle tone</td>
<td>Limp</td>
<td>Some Flexion</td>
<td>Active Motion</td>
</tr>
<tr>
<td>Respiration</td>
<td>Absent</td>
<td>Weak Cry; Hypoventilation</td>
<td>Good, Crying</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Gestational age___________weeks</th>
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<table>
<thead>
<tr>
<th>1 minute</th>
<th>5 minute</th>
<th>10 minute</th>
<th>15 minute</th>
<th>20 minute</th>
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<table>
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<tr>
<th>Comments:</th>
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<table>
<thead>
<tr>
<th>Resuscitation</th>
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<tbody>
<tr>
<td>Minutes</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>1</td>
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<tr>
<td>5</td>
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<tr>
<td>10</td>
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<tr>
<td>15</td>
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<tr>
<td>20</td>
</tr>
</tbody>
</table>

- Oxygen
- PPV/NCPAP
- ETT
- Chest Compressions
- Epinephrine
**complete physical exam**

- Vital signs
- Measurements
- Physical exam
- Neurological exam
- Estimation of gestational age

- 1st examination in delivery room or as soon as possible after delivery
- 2nd and more detailed examination after 24 h of life
- Discharge examination with 24 h of discharge from hospital
Normal Newborn Exam

- Put baby on flat surface and remove clothes
- Always go head to toe
- Measurements:
  - Head circumference
  - Length
  - Foot length
- If the baby cries, offer a gloved finger
- It is important to examine all babies, even if they are stillbirths
- Document every abnormality however minor
Length

- Crown to heel length should be obtained on admission and weekly
- Acceptable newborn length ranges from 48-52 cm at birth
Head circumference
WHY TAKE HC/LENGTH/WEIGHT?

IUGR/SGA

Asymmetric
❖ Weight <10 percentile, HC and length normal
❖ 55% of SGA infants

Symmetric
❖ HC, length, weight all <10 percentile
❖ 33% of SGA infants

Combined
❖ –
❖ Symmetric or asymmetric
❖ 12% of SGA infants
General

- **Pallor**: associated with low hemoglobin or shock
- **Cyanosis**: associated with hypoxemia
- **Plethora**: associated with polycythemia
- **Jaundice**: elevated bilirubin
- **Skin**

**Acrocyanosis**
Head

Skull
- Macrocephaly and microcephaly
- Caput succedaneum cephalhematoma, subgaleal hemorrhage
- Fontanelle
Eye

- Pupils: equality, reactivity to light.
- Squint
- Cornea
- Conjunctiva
- Iris
Common Anomalies

Absent orbits

Abnormal pupils
EAR
Assess for asymmetry or irregular shape

- Note presence of auricular or pre-auricular pits, fleshy appendages, lipomas, or skin tags.
- Associated with genitourinary anomalies

Low set ears
- Below lateral canthus of eye
  - Can be associated with Downs or Turners Syndromes

Malformed ears
Nose

- Patency of each nostril: exclude choanal atresia
- Abnormalities
- Flaring of nostrils
Common Anomalies

Cleft lip and palate

Isolated cleft palate

Cleft lip + palate
Common Anomalies

Cleft lip and palate surgery

Picture 4: Inner (nasal) layer of tissue is closed.

Picture 5: Outer (oral) layer is closed (Step 6). ‘Z’ shaped closure of repaired cleft palate (Step 7)
Mouth

- Cleft lip and palate
- Tongue tie
- Natal teeth
- Tongue size
Neck

- **Cysts:** Thyroglossal cyst Cystic hygroma
- **Masses:** Sternomastoid tumor Thyroid
- **Webbing**
CHEST

Inspection
❖ Supernumerary breast or nipple is common (10%)
❖ Breast enlargement secondary to maternal hormones
❖ Unilateral absence or hypoplasia of pectoralis major
   ❖ Poland's Syndrome (Poland's Sequence)
❖ Widely spaced nipples - Turner's Syndrome, Noonan Syndrome

Chest Deformity
❖ Pectus Carinatum
   – Much less common than Pectus Excavatum
   – More common in males by ratio of 4:1
   – Narrow thorax with increased anteroposterior diameter
❖ Pectus Excavatum
   – Gender predominance: Boys (3:1 ratio) – Mild: Oval pit near infrasternal notch
   – Severe: Sinking of entire lower sternum
Chest

Observe
- Respiratory pattern
  - Brief periods apnea are normal in transition, called “periodic breathing”
- Chest movement • Symmetry
- Retractions and Tracheal tugging

Auscultation
- Audible stridor, grunting – Wheeze, rales.
- Tachypnea, tachycardia
- Increased pericordial activity
- Auscultation of heart sounds, murmurs or Irregular heart rhythm
- Perfusion: Capillary refill time
- Palpate femoral pulsation: absent in coarctation of the aorta
- Bounding pulses often indicated PDA
Abdomen

- Organomegaly: liver may be palpable 1-2 cm below the costal margin. Spleen is at the costal margin.
- Masses
- Distension, scaphoid abdomen
- Umbilical stump: bleeding, meconium straining, granuloma, discharge, inflammation
- Omphalocele and Gastrochisis
GENITALIA

Male genitalia
❖ In full term,
  ❖ scrotum is well developed, with deep rugae.
  ❖ Both testes are in the scrotum
❖ In preterm,
  ❖ scrotum is small with few rugae. Testes are absent or high in the scrotum
❖ Abnormalities: undescended testis, hydrocele, inguinal hernia, hypospadius

Female genitalia
❖ In full term, labia majora completely cover labia minora

DSD - Disorder of sex differentiation
HYPOSPADIAS

Subtypes:

Q54 Hypospadias (avoid using this general code if more specific information is available)

Q54.0 Hypospadias, balanic coronal, glanular
Q54.1 Hypospadias, penile (subcoronal hypospadias)
Q54.2 Hypospadias, penoscrotal
Q54.3 Hypospadias, perineal
Q54.8 Other hypospadias, excludes: female hypospadias (Q52.81)
Q54.9 Hypospadias, unspecified
Anal opening

- The anus is inspected for its location and patency.
- An imperforate anus is not always immediately apparent.
- Thus, patency often is checked by careful insertion of a rectal thermometer to measure the baby's first temperature.
Neural Tube

Photographs sourced courtesy of CDC Beijing Medical University collaborative project.
Musculoskeletal

- Fractures
- Dislocations
- Polydactyly
- Syndactyly
- Deformities
Common Anomalies

Musculoskeletal system
NEUROLOGIC EXAM

- TONE
- REFLEXES
- POSITION
## PRETERM - Ballard score

### Neuromuscular Maturity

<table>
<thead>
<tr>
<th>Score</th>
<th>Posture</th>
<th>Square window (wrist)</th>
<th>Arms recoil</th>
<th>Popliteal angle</th>
<th>Scarf sign</th>
<th>Heel to ear</th>
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<tbody>
<tr>
<td>-1</td>
<td><img src="image1" alt="Image" /></td>
<td><img src="image2" alt="Image" /></td>
<td><img src="image3" alt="Image" /></td>
<td><img src="image4" alt="Image" /></td>
<td><img src="image5" alt="Image" /></td>
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<td><img src="image8" alt="Image" /></td>
<td><img src="image9" alt="Image" /></td>
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<td><img src="image11" alt="Image" /></td>
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<td><img src="image20" alt="Image" /></td>
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<td><img src="image22" alt="Image" /></td>
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<td>3</td>
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<td><img src="image27" alt="Image" /></td>
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<tr>
<td>4</td>
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<td><img src="image33" alt="Image" /></td>
<td><img src="image34" alt="Image" /></td>
<td><img src="image35" alt="Image" /></td>
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<tr>
<td>5</td>
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<td><img src="image41" alt="Image" /></td>
<td><img src="image42" alt="Image" /></td>
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### Physical Maturity

<table>
<thead>
<tr>
<th>Score</th>
<th>Skin</th>
<th>Lanugo</th>
<th>Plantar surface</th>
<th>Breast</th>
<th>Eye/Ear</th>
<th>Genitals (male)</th>
<th>Genitals (female)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1</td>
<td>Sticky, friable, translucent</td>
<td>None</td>
<td>Heel-toe: 40-50 mm: -1</td>
<td>Imperceptible</td>
<td>Lids fused loosely: -1 tightly: -2</td>
<td>Scrotum flat, smooth</td>
<td>Clitoris prominent, labia flat</td>
</tr>
<tr>
<td>0</td>
<td>Geleious, red, translucent</td>
<td>Sparse</td>
<td>&lt;40 mm: -2</td>
<td>Barely perceptible</td>
<td>Lids open; pinna flat; stays folded</td>
<td>Scrotum empty, faint rugae</td>
<td>Clitoris prominent, small labia minora</td>
</tr>
<tr>
<td>1</td>
<td>Smooth, pink; visible veins</td>
<td>Abundant</td>
<td>&gt;50 mm, no crease</td>
<td>Flat areola, no bud</td>
<td>Slightly curved pinna; soft; slow recoil</td>
<td>Testes in upper canal, rare rugae</td>
<td>Clitoris prominent, enlarging minora</td>
</tr>
<tr>
<td>2</td>
<td>Superficial peeling and/or rash; few veins</td>
<td>Thinning</td>
<td>Anterior transverse crease only</td>
<td>Stippled areola, 1–2 mm bud</td>
<td>Well curved pinna; soft but ready recoil</td>
<td>Testes descending, few rugae</td>
<td>Clitoris prominent, equally prominent</td>
</tr>
<tr>
<td>3</td>
<td>Cracking, pale areas; rare veins</td>
<td>Bald areas</td>
<td>Creases anterior 1/3</td>
<td>Raised areola, 3–4 mm bud</td>
<td>Formed and firm, instant recoil</td>
<td>Testes down, good rugae</td>
<td>Majora and minora equal prominent</td>
</tr>
<tr>
<td>4</td>
<td>Parchment, deep cracking; no vessels</td>
<td>Mostly bald</td>
<td>Creases over entire sole</td>
<td>Full areola, 5–10 mm bud</td>
<td>Thick cartilage, ear still</td>
<td>Testes pendulous, deep rugae</td>
<td>Majora large, minora small</td>
</tr>
<tr>
<td>5</td>
<td>Leathery, cracked, wrinkled</td>
<td>Mostly bald</td>
<td>Maturity Rating</td>
<td>0–28</td>
<td>25–34</td>
<td>30–38</td>
<td>40–42</td>
</tr>
</tbody>
</table>

### Score | Weeks
---|---
-10 | 20
-5  | 22
0   | 24
5   | 26
10  | 28
15  | 30
20  | 32
25  | 34
30  | 36
35  | 38
40  | 40
45  | 42
50  | 44
Discussing Anomalies with Parents

Diagnoses should be discussed only by healthcare providers

Tell parents about diagnosis as soon as possible, even if not confirmed

Someone with sufficient knowledge of the diagnosis and prognosis should tell parents in private

Use non-medical terms that are easy to understand

Consider writing down information about the diagnosis to help parents remember
Discussing Anomalies with Parents

Use sensitive words and avoid using negative phrases like “I’m sorry” or “Unfortunately”

Check to see if parents understood information, especially of etiology since parents often feel guilt about congenital anomalies

Provide resources for next steps
MTRH documentation

**NEWBORN SURFACE EXAMINATION AND DOCUMENTATION FORM**

<table>
<thead>
<tr>
<th>Mothers Name</th>
<th>HIV Status</th>
<th>Hospital Number</th>
<th>CCC Number</th>
</tr>
</thead>
</table>

**Neonatal Data**

<table>
<thead>
<tr>
<th>Time Of Delivery</th>
<th>Gender</th>
<th>Normal Ranges (For Term baby = &gt;37 weeks Gestation)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Birth Weight: ≥ 2.5 &lt; 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Head circumference: 35 ± 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Birth Length</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Foot Length</td>
</tr>
</tbody>
</table>

**Infant Physical Examination**

<table>
<thead>
<tr>
<th>Normal</th>
<th>Anomaly Present</th>
<th>Describe any anomaly identified</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eyes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ears</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nose and Mouth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neck and Clavicles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chest and Lungs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abdomen and Cord</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Genitalia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Back and Spine</td>
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</tr>
<tr>
<td>Limbs and Hip</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neonatal Reflexes</td>
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</tbody>
</table>

### Remarks

- Give baby to mother
- Admit to NBU
- Discharge through Clinic (Name of clinic)

Name ____________________________ Signature ____________________________
Questions?