

# NEW BORN EXAMINATION

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# Objectives

- Classification of new born
- Understand Apgar score
- Assess growth measurements
- Assess vital signs
- Estimate the gestational age
- Assess the different body systems
- Recognize normal findings in newborn examination
- Recognize common newborn problems
- Remember to Wash your hand prior to examination

## **Classification of newborn**

### Classification by Gestational Age

- Pre term <37 wks
- Full term 37-40 wks
- Post term >42 wks

### Classification By Birth Weight

- LBW < 2500 g
- VLBW < 1500 g
- ELBW < 1000 g

### Classification By Weight Percentiles of GA

- AGA 10th-90th
- SGA < 10th
- LGA >90th

# Classification of newborn

## ➤ Classification by Gestational Age

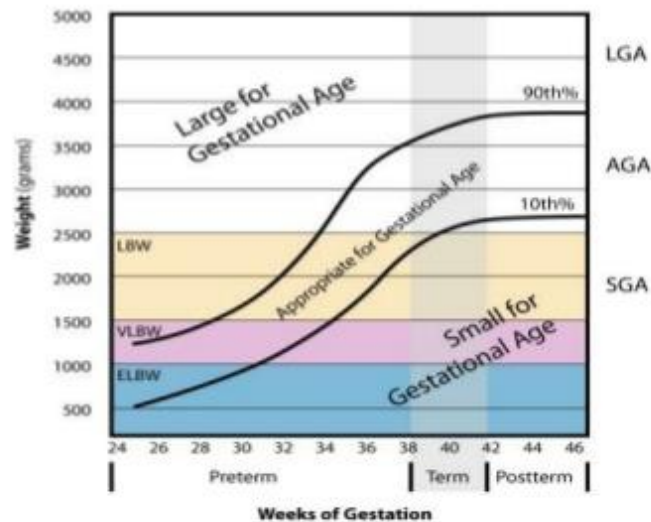
Preterm <37 wks  
Full term 37-40 wks  
Post term >42 Wks

## ➤ Classification By Birth Weight

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## ➤ Classification By Weight Percentiles of GA

AGA 10<sup>th</sup>-90<sup>th</sup>  
SGA < 10<sup>th</sup>  
LGA >90<sup>th</sup>



- Examination of newborn should be done within
  1. first few mts of birth.
  2. within first 48 hrs
  3. before discharge

Complete physical exam includes:

- 1. Vital signs
- 2. Physical examination
- 3. Neurological examination
- 4. Estimation of gestational age

## Vital signs

- Temperature
- Heart rate
- Respiratory rate
- Blood pressure
- Capillary refill time
- Oxygen saturation

## Measurements to be taken in new born:

- Weight
- Length
- Head circumference
- Chest circumference

## Measurements

- Weight
- Length
- Head circumference





## General examination

- Well or in Distress?
- Skin colour – Pink is Normal.
- Pallor associated with low haemoglobin or shock
- Plethora associated with polycythaemia
- Blue bruised part or cyanosis
- Jaundice
- Common skin rashes
  - Erythema toxicum, Mongolian spot, Benign Pustular Melanosis, Milia, sebaceous hyperplasia, dryness, cracking & peeling, Naevus simplex or salmon patch, Dermal melanocytosis

- Purpura
- Ecchymosis
- Mottling
- Vernix caseosa
- Edema
- Collodion infant
- lanugo hair
- Impetigo
- Diaper rash
- Haemangioma

## Cyanosis

– Cyanosis



- Acro cyanosis is normal



## Jaundice



Figure 4. Jaundice pressing the red color from the skin allows better recognition of the yellow of jaundice. A: Infant with no appreciable jaundice at chest level. B: Infant with bilirubin level of 13 mg/dl (222  $\mu$ mol/L).

## Skin

- Purpura,echymosis
- Mottling
- Vernix caseosa



## Skin

- Edema
- Mongolian spots
- Collodion infant



## Skin rashes

- Milia
- Erythema toxicum
- Impetigo



## Skin rashes

- Diaper rash
- Hemangiomas

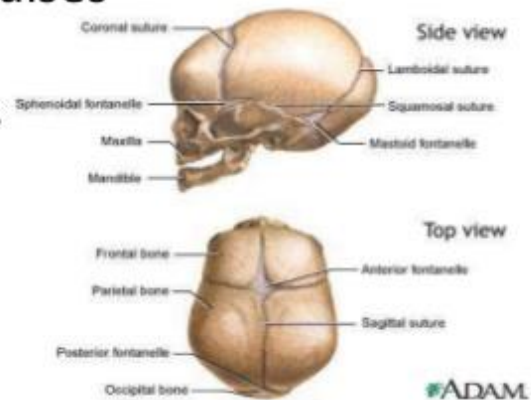


# Head

1. General Cuts, Bruises
2. Anterior and posterior fontanelles ,Large anterior fontanelle, Small anterior fontanelle,Bulging fontanelle ,Moulding
3. Caput succedaneum
4. Cephalohematoma
5. Increased intracranial pressure
6. Craniosynostosis
7. Craniotabes

# HEAD : General, Cuts, Bruises

- Anterior and posterior fontanelles
  - Large anterior fontanelle
  - Small anterior fontanelle
  - Bulging fontanelle
- Molding
- Caput succedaneum
- Cephalohematoma
- Increased intracranial pressure
- Craniosynostosis
- Craniotabes



- Macrocephaly-  $>+2$  SD
- Hydrocephalus
- Microcephaly  $<-3$ SD
- Subgaleal haemorrhage



## Head and Neck

- Macrocephaly / Hydrocephalus
- Microcephaly
- Subgaleal hemorrhage



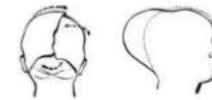
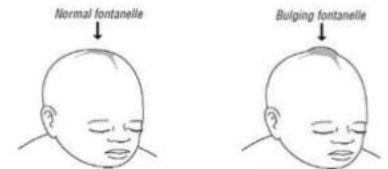
## Head and Neck

- Macrocephaly / Hydrocephalus
- Microcephaly
- Subgaleal hemorrhage



## Head and Neck

- Fontanelle
- Moulding
- Caput succedaneum



## NECK :

1. Shape, Range of motion, Webbing
2. Palpate for masses
3. Brachial palsy – Erb's palsy
4. Fractured clavicle
5. Palpable Masses: Sternomastoid tumor  
Thyroid Cyst, Thyroglossal cyst, Cystic hygroma.

# Neck

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



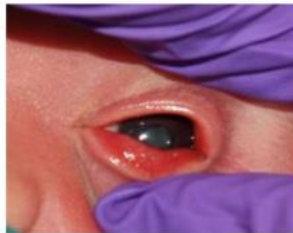
# EYE

## Hypertelorism

- Pupils: equality, reactivity to light.
- Squint
- Cornea , Conjunctiva • Iris
- Ophthalmia neonatorum • Congenital cataract
- Corneal opacity
  - Glaucoma • Squint • Subconjunctival bleed
- Orbital Placement
- Hypertelorism is defined by an increased interpupillary distance.

## Eyes

- Ophthalmia neonatorum
- Congenital cataract
- Corneal opacity



## Eyes

- Glaucoma
- Squint
- Subconjunctival bleed



## Ear Examination

- Assess for asymmetry or irregular shape – Auricular or pre-auricular pits, fleshy appendages, lipomas, or skin tags.
- Low set ears-below the horizontal line connecting both inner canthi of eye
- Associated with genitourinary anomalies.
- Malformed ears can be associated with Down or Turner Syndrome.

## Ear Examination

Assess for asymmetry or irregular shape

- Auricular or pre-auricular pits, fleshy appendages, lipomas, or skin tags.
- Low set ears
  - Below lateral canthus of eye
  - Associated with genitourinary anomalies.
- Malformed ears
  - Can be associated with Downs or Turners Syndromes



Normally developed outer ear (pinna)



Abnormal size, shape, rotation and/or location of pinna

#ADAM

## Ear Examination

- Ear Tag





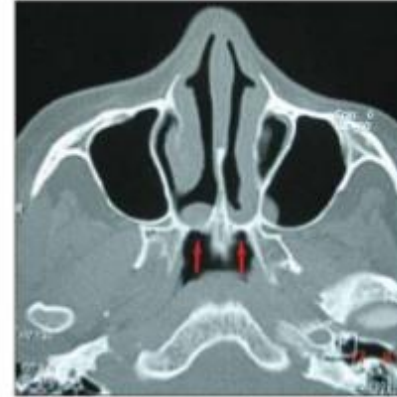
## Nose

- Patency of each nostril, exclude choanal atresia
- Flaring of nostrils
- Nasal septum
- upturned nose

▬

## Nose

- Patency of each nostril;  
exclude choanal atresia
- Flaring of nostrils
- Nasal septum



## Mouth

- Cleft lip and palate
- Tongue tie
- Epstein pearls
- Natal teeth
- Tongue size
- Oral Thrush
- Ranula

## Mouth

- Cleft lip and palate
- Tongue tie



## Mouth

- Epstein pearls
- Natal teeth
- Tongue size



# Mouth

- Oral Thrush
- Ranula



## Extremities –

- Syndactyly
- Polydactyly
- Oligodactyly
- Congenital Talipes Equinovarus (CTEV)
- Metatarsus Varus
- Spine - Inspect back for meningocele, meningomyelocele. tufts of hair
- Hips - Congenital hip dislocation – Asymmetry of the skin folds on thigh.

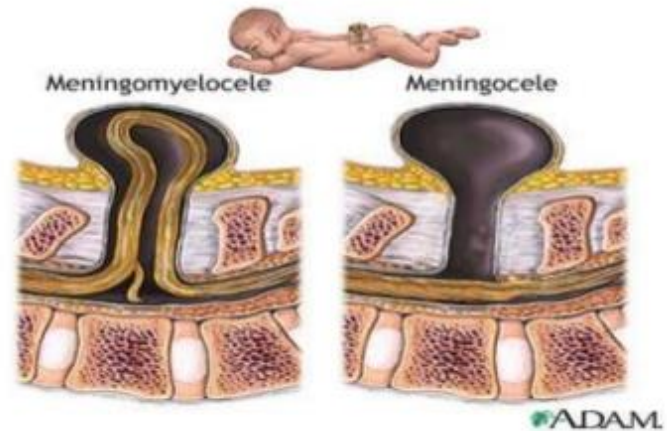
# Extremities

- Syndactyly
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# Spine

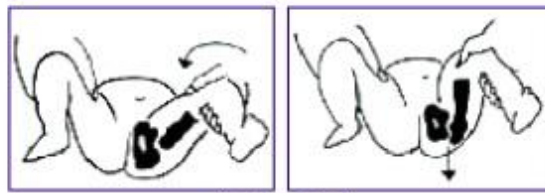
- Inspect back for meningocele



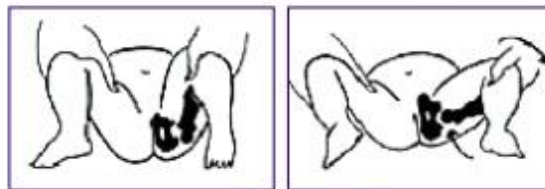


# Hips

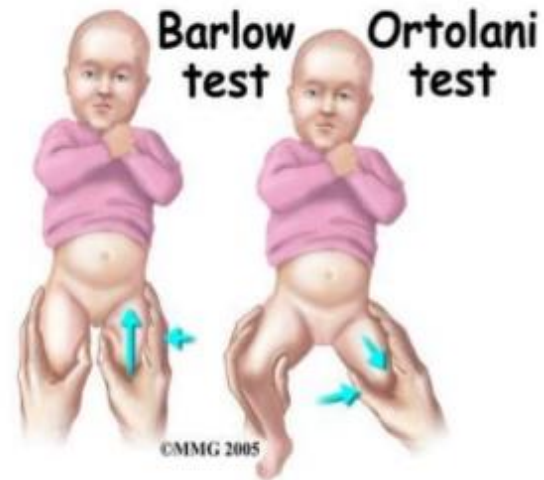
- Congenital hip dislocation
  - Assymetry of the skin folds on the dorsal surface
  - Shortening of the affected leg



Barlow Test



Ortolani Test



## Chest/Lung Examination

- Inspection – Supernumerary breast or nipple, Unilateral or absence of pectoralis major
- Poland Syndrome (Poland Sequence) – Widely spaced nipples
- Turner Syndrome and Noonan Syndrome- Chest Deformity
- Pectus Carinatum
- Pectus Excavatum

## Observe –

Respiratory pattern ,periodic breathing

Chest movement

Symmetry

Retractions and Tracheal tugging

Auscultation – Audible stridor, grunting,  
wheeze, rales.

## Heart and vascular system

- Tachypnea,tachycardia
- Increased pericordial activity
- Cyanosis,
- hyperoxia test
- Auscultation of heart sounds, murmur
- Perfusion-Capillary refill time
- Palpate femoral pulsation-absent in coarctation of the aorta
- Bounding pulse in PDA

## Abdomen

- Organomegaly-liver may be palpable, Distension , scaphoid abdomen.
- Normal Liver size is 2.5 cm. Spleen usually not palpable
- Umbilical stump bleeding , meconium staining, granuloma, discharge, inflammation
- Omphalocele and Gastroschisis
- Prominent xiphisternum
- Normal umbilical cord –no of vessels
- Meconium Stained Umbilical Cord
- Diastasis recti

## Abdomen

- Normal umbilical cord
- Meconium Stained Umbilical Cord
- Omphalocele



## Abdomen

- Scaphoid abdomen
- Abdominal distension
- Diastasis recti



## Male Genitalia

- In full term neonates scrotum is well developed, both testes are in the scrotum
- Normal stretchable length of Penis >2.5 cm.
- In preterm neonates scrotum is small with few rugae. Testes are absent or high in the scrotum.

## Male genitalia

- Bilateral hydrocele • Inguinal Hernias • Hypospadias/epispadias ,chordae

## Female genitalia

- In full term neonates labia majora completely cover labia minora .
- Mean Clitoral length in term infants is 4+-1.24mm.
- In preterm neonates labia majora is widely separated and labia minora protruded.

Withdrawal bleeding • Ambiguous Genitalia

## Male genitalia

- Bilateral hydrocele
- Inguinal Hernias
- Hypospadias



## Female genitalia

- Withdrawal bleeding
- Ambiguous Genitalia





## Anus

- Meconium should pass in the first 48h after birth
- Delayed passage of meconium may indicate -- imperforate anus, Hirshsprung disease or intestinal obstruction
- Urine should pass in the first 24h of life
- Imperforate Anus
- Sacro-coccygeal dimple

## Anus

- Imperforate Anus
- Sacro-coccygeal dimple



## Nervous System

- Observe for any abnormal movement/ excessive irritability
- Muscle tone – Hypotonia , Floppiness , Hypertonia - Extended arms & legs, hyperextension of back & tightly clenched fists.

## Neonatal reflexes

- Also known as primitive reflexes.
- Autonomic behaviours that do not require higher level brain functioning.
- Provide information about integrity of CNS.
  - Their absence indicate CNS depression .
- They are often protective and disappear as higher level motor functions emerges.

## Moro Reflex

- Most important reflex in neonatal period • Onset: 28-32 weeks GA .

Disappearance:4-6 months

### Significance of Moro

- Bilateral absence: - CNS depression by narcotics or anaesthesia , Brain anoxia and kernicterus , Very Premature baby
- Asymmetric response: Erbs palsy , fracture clavicle or humerus .
- Persistence beyond 6th month: CNS damage

- Suckling Reflex appears at 32 wk & disappears by 3 – 4 months.
- Rooting Reflex Appears at 32 wk & disappears by 1 month.
- Tonic neck reflex -Fencing posture
- Palmar grasp reflex
- Stepping reflex
- Galant reflex
- Perez reflex
- Placing reflex

# Neonatal reflexes

## Moro Reflex

- Most important reflex in neonatal period
- Onset: 28-32 weeks GA
- Disappearance: 4-6 months.



## Neonatal reflexes

- **Suckling Reflex**

Appears at 32 wk & disappears by 3 – 4 m

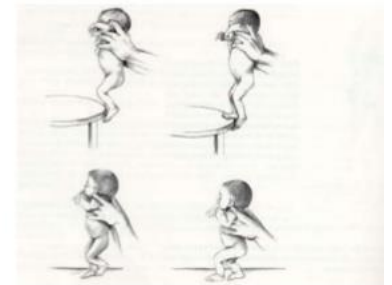
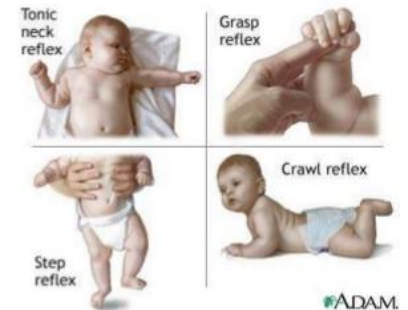
- **Rooting Reflex**

Appears at 32 wk & disappears by 3 – 4 m



## Neonatal reflexes

- Tonic neck reflex  
Fencing posture
- Palmar grasp reflex
- Stepping reflex
- Placing reflex



## Gestational Age Assessment

- Obstetricians - LMP
- Ultrasound
- New Ballard score Includes 6 Physical maturity & 6 Neuromuscular maturity.



# MATURATIONAL ASSESSMENT OF GESTATIONAL AGE (New Ballard Score)

NAME \_\_\_\_\_ SEX \_\_\_\_\_  
 HOSPITAL NO. \_\_\_\_\_ BIRTH WEIGHT \_\_\_\_\_  
 RACE \_\_\_\_\_ LENGTH \_\_\_\_\_  
 DATE/TIME OF BIRTH \_\_\_\_\_ HEAD CIRC. \_\_\_\_\_  
 DATE/TIME OF EXAM \_\_\_\_\_ EXAMINER \_\_\_\_\_  
 AGE WHEN EXAMINED \_\_\_\_\_  
 APGAR SCORE: 1 MINUTE \_\_\_\_\_ 5 MINUTES \_\_\_\_\_ 10 MINUTES \_\_\_\_\_

## NEUROMUSCULAR MATURITY

NEUROMUSCULAR MATURITY SIGN	SCORE						RECORD SCORE HERE
	-1	0	1	2	3	4	
POSTURE							
SQUARE WINDOW (Wrist)							
ARM RECDIL							
POPLITEAL ANGLE							
SCARF SIGN							
HEEL TO EAR							
TOTAL NEUROMUSCULAR MATURITY SCORE							

SCORE  
 Neuromuscular \_\_\_\_\_  
 Physical \_\_\_\_\_  
 Total \_\_\_\_\_

## MATURITY RATING

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

## PHYSICAL MATURITY

PHYSICAL MATURITY SIGN	SCORE						RECORD SCORE HERE
	-1	0	1	2	3	4	
SKIN	Sticky Friable Transparent	Gelatinous Red Translucent	Smooth pink Visible veins	Superficial Peeling and /or rash, few veins	Cracking Pale areas Rare veins	Parchment Deep cracking No vessels	Leathery Cracked Wrinkled
LANUGO	None	Sparse	Abundant	Thinning	Bald areas	Mostly bald	
PLANTAR SURFACE	Heel-toe 40-50 mm: -1 <40 mm: -2	>50 mm no crease	Faint red marks	Anterior transverse crease only	Creases ant. 2/3	Creases over entire sole	
BREAST	Imperceptible	Barely perceptible	Flat areola no bud	Stippled areola 1 to 2 mm bud	Raised areola 3 to 4 mm bud	Full areola 5 to 10 mm bud	
EYE/EAR	Lids fused Loosely: -1 Tightly: -2	Lids open Pinna flat Stays folded	Sl. curved pinna; soft; slow recoil	Well-curved pinna; soft but ready recoil	Formed and firm instant recoil	Thick cartilage ear shift	
GENITALS (Male)	Scrotum flat, smooth	Scrotum empty	Testes in upper canal Rare rugae	Testes descending Few rugae	Testes down Good rugae	Testes Pendulous Deep rugae	
GENITALS (Female)	Clitoris prominent and labia flat	Prominent clitoris and small labia minora	Prominent clitoris and enlarging minora	Majora and minora equally prominent	Majora large minora small	Majora cover clitoris and minora	
TOTAL PHYSICAL MATURITY SCORE							

GESTATIONAL AGE (weeks)  
 By dates \_\_\_\_\_  
 By ultrasound \_\_\_\_\_  
 By exam \_\_\_\_\_

Figure 7.1. New Ballard score. (From Ballard JL, Khoury JC, Wedig K, et al. New Ballard Score, expanded to include extremely premature infants. *J Pediatr* 1991;119:417-423.)



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ST. DIABETES  
WALK TO CURE  
2005

WALK TO CURE  
2005

ST. DIABETES  
WALK TO CURE  
2005

THE WALK TO CURE DIABETES

ST. DIABETES  
WALK TO CURE  
2005

WALK TO CURE  
2005

JUNE 2005  
WALK TO CURE DIABETES

Runners  
We're on Track  
For a Cure