

جامعة المعارف – كلية التمريض

النمو والنماء النظري

المرحلة – الثالثة

الدكتور

احمد عبود مخلف الفهداوي

دكتوراه تمريض الأطفال

Part 4

Newborn and infant stage

NEWBORN STAGE

Newborn stage is the first 4 weeks or first month of life. It is a transitional period from intrauterine life to extra uterine environment.

NORMAL NEWBORN

Physical Growth

- Weight = 2.700 – 4 kg
- Wt loss 5% -10% by 3-4 days after birth
- Wt gain by 10th days of life

They lose 5 % to 10 % of weight by 3-4 days after birth as result of :

- Withdrawal of hormones from mother .
- Loss of excessive extra cellular fluid .
- Passage of meconium (feces) and urine .
- Limited food intake .

HEIGHT

- Boys average Ht = 50 cm
- Girls average Ht = 49 cm
- Normal range for both (47.5- 53.75 cm)

Head circumference

33-35 cm Head is $\frac{1}{4}$ total body length Skull has 2 fontanels (anterior & posterior)

Chest circumference

It is 30.5 to 33cm (usually 2–3cm less than head circumference).

ANTERIOR FONTANEL

- Diamond in shape
- The junction of the sagittal, coronal and frontal sutures forms it •

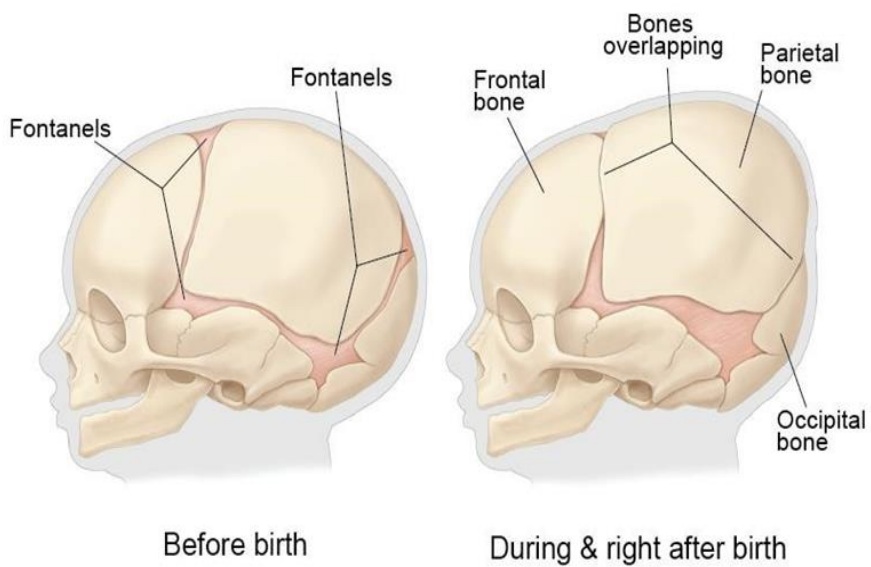
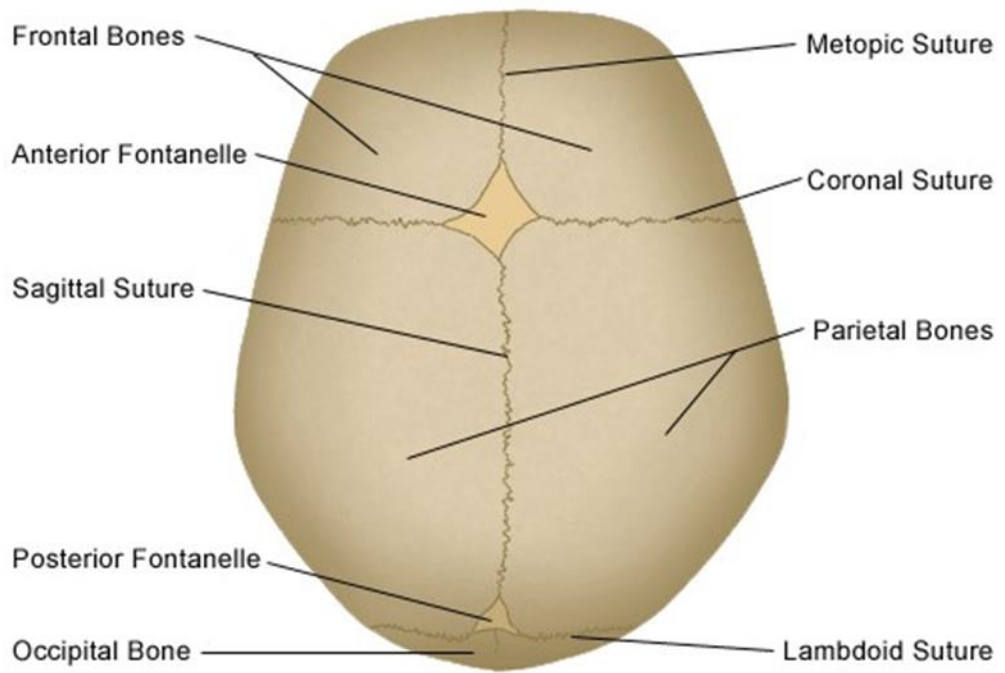
Between 2 frontal & 2 parietal bones

- 3-4 cm in length and 2-3 cm width
- It closes at 12-18 months of age

Posterior fontanel

- Triangular • Located between occipital & 2 parietal bones • Closes by the end of the 1st month of age.

Normal Skull of the Newborn



PHYSIOLOGICAL GROWTH

Vital signs

- Temperature (36.3 to 37.2°C).
- Pulse (120 to 160 b/min).
- Respiration (35 to 50C/min) .

Five factors are used to evaluate the baby's condition and each factor is scored on a scale of 0-2 ,with 2 being the best score.

Example :you are assessing the one minute APGAR score of newborn baby .on assessment ,you note the following about your newborn patient : heart rate 101, cyanotic body and extremities , no response to stimulation ,no flexion of extremities , and strong cry, what is your patients APGAR score?

- A. APGAR 4
- B. APGAR 6
- C. APGAR 3
- D. APGAR 2

APGAR SCORING SYSTEM

	0 Points	1 Point	2 Points	Points totaled
Activity (muscle tone)	Absent	Arms and legs flexed	Active movement	↓
Pulse	Absent	Below 100 bpm	Over 100 bpm	
Grimace (reflex irritability)	Flaccid	Some flexion of Extremities	Active motion (sneeze, cough, pull away)	
Appearance (skin color)	Blue, pale	Body pink, Extremities blue	Completely pink	
Respiration	Absent	Slow, irregular	Vigorous cry	

Severely depressed	0-3
Moderately depressed	4-6
Excellent condition	7-10

ORGAN SYSTEM MATURATION

Neurologic System

Involuntary movement progresses to voluntary control, and immature vocalizations and crying progress to the ability to speak as a result of maturational changes of the neurologic system

1--States of Consciousness The normal term newborn's ability to move sequentially through states of consciousness reassures parents and physicians that the neurologic system, though immature, is intact.

A normal newborn will ordinarily move through six states of consciousness:

1. **Deep sleep:** The infant lies quietly without movement.

2. **Light sleep:** The infant may move a little while sleeping and may startle to noises.
3. **Drowsiness:** Eyes may close; the infant may be dozing.
4. **Quiet alert state:** The infant's eyes are open wide and the body is calm.
5. **Active alert state:** The infant's face and body move actively.
6. **Crying:** The infant cries or screams and the body moves in a disorganized fashion (Newborns usually progress through these states slowly, rather than going from deep sleep immediately into outright crying).

2--SENSORY DEVELOPMENT

- Touch
- Vision
- Hearing
- Taste
- Smell
- **Touch**
- It is the most highly developed sense.
- It is mostly at lips, tongue, ears, and forehead.
- The newborn is usually comfortable with touch.

VISION

- ❖ Pupils react to light .
- ❖ Bright to lights appear to be unpleasant to newborn infant
- ❖ Follow objects in line of vision

HEARING

- ❖ The newborn infant usually makes some response to sound from birth .
- ❖ Ordinary sounds are heard well before 10 days of life .
- ❖ The newborn infant responds to sounds with either cry or eye movement, cessation of activity and / or startle reaction.

TASTE

Well developed as bitter and sour fluids are resisted while sweet fluids are accepted.

Smell

Only evidence in newborn infant's search for the nipple, as he smell breast milk.

3--REFLEXES OF NEWBORNS

Reflexes is an involuntary or automatic action that your body does in response to something without even having to think about it. These primitive reflexes are also called infantile, infant or newborn reflexes.

- ❖ As general reflexes divided to 3 main group

- ❖ Feeding (Rooting , Gag And Swallowing, Sucking)
- ❖ Protective (Cough , Sneezing, Yawning ,Blinking)
- ❖ Motor (Moro ,Startle ,Grasping ,Tonic-Neck, Stepping ,Babinski) .

1--PROTECTIVE REFLEXES :

Reflexes that persist into adulthood are :

- + **Blinking reflex** – you blink your eyes when are touched or when are touched or when sudden bright appears
- + **Cough reflex** – you coughs when your airway is stimulated .
- + **Gag reflex**- you gag when the throat or back of moth is stimulated .
- + **Sneeze reflex** – you sneeze when nasal passage irritated .
- + **Yawn reflex**- you yawn when the body needs additional oxygen

2. FEEDING REFLEXES:

Sucking reflex sucks when area around mouth stimulated

Rooting reflex: is elicited by stroking the cheek. The infant will turn toward the side that was stroked and begin to make sucking motions with is mouth.

Extrusion R. When tongue is touched or depressed infant responds by foreign it outward.

Swallowing R. This reflex is present at birth and persist throughout life .



2. MOVEMENT REFLEXES :

Grasping Reflex:

- When the inside of the palm is touched, babies grasp a finger tightly.

Startle Reflex:

- When a baby is put down, held away, or hears a loud noise, a baby throws out their arms, draw back their head and stretch out their legs in response.

Babinski Reflex :

- Babies extend their toes when the soles of their feet are stroked.

Tonic neck reflex:

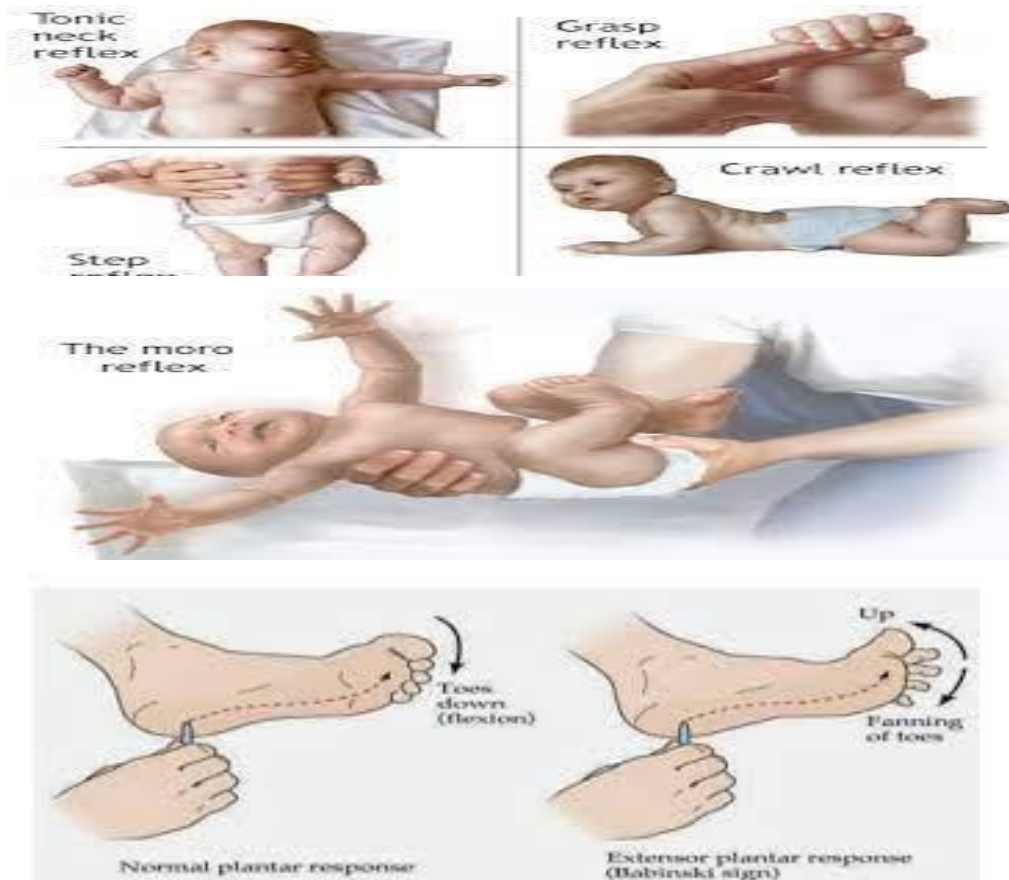
- The tonic neck reflex, also known as asymmetric tonic neck reflex or 'fencing posture' is present at one month of age and disappears at around four months. When the child's head is turned to the side, the arm on

that side will straighten and the opposite arm will bend (sometimes the motion will be very subtle or slight).

Crawl R. :When placed on abdomen, infant make crawling movement , with arms and legs .

Dance or step R. : Infants held sole of foot touches a hard surface there is a reciprocal flexion and extension of the leg. Simulating walking .

More R : sudden jarring or change in equilibrium cause sudden extension and abduction of extremities and fanning of fingers , with index finger and thumb forming C shape of extremities .





Gastrointestinal System Digestion.

The newborn's digestive system is not developed fully. The liver is also immature at birth. The ability to conjugate bilirubin and secrete bile is present after about 2 weeks of age.

Other functions of the liver, including gluconeogenesis, vitamin storage, and protein metabolism, remain immature during the first year of life.

The consistency and frequency of stools change over the first year of life. The newborn's first stools (meconium) are the result of digestion of amniotic fluid swallowed in utero. They are dark green to

black and sticky (. In the first few days of life the stools become yellowish or tan. Generally the formula-fed infant has stools the consistency of peanut butter. Breastfed infants' stools are usually looser in texture and appear seedy. Newborns may have as many as 8 to 10 stools per day or as few as one stool every day or two. After the newborn period, the number of stools may decrease, and some infants do not have a bowel movement for several days. Infrequent stooling is considered normal if the bowel movement remains soft. Due to the immaturity of the gastrointestinal system, newborns and young infants often grunt, strain, or cry while attempting to have a bowel movement. This is not of concern unless the stool is hard and dry. Stool color and texture may change depending on the foods that the infant is ingesting.

Integumentary System

In utero the fetus is covered with **vernix caseosa**, which protects the developing fetus skin. At birth, the newborn may be covered with vernix (earlier gestational age) or vernix may be found in the folds of the .skin, axilla, and groin areas (later gestational age) Fine downy hair (**lanugo**) covers the body of many newborns. Often .this hair is lost over time and is not replaced **Acrocyanosis** (blueness of the hands and feet) is normal in the newborn; it decreases over the first few days of life Newborns often experience **mottling of the skin** (a pink-and-white .marbled appearance) because of their immature circulatory system .Mottling decreases over the first few months of life The newborn and young infant's skin is relatively thinner than that of

the adult, with the peripheral capillaries being closer to the surface. This may cause increased absorption of topical medications.

Hematopoietic System

Significant changes in the hematopoietic system occur over the first year of life. At birth, fetal hemoglobin (HgbF) is present in large amounts. After birth the production of fetal hemoglobin nearly ceases, and adult hemoglobin (HgbA) is produced in steadily increasing amounts throughout the first 6 months. Since HgbF has a shorter lifespan than HgbA, infants may experience physiologic anemia at age 2 to 3 months. During the last 3 months of gestation, maternal iron stores are transferred to the fetus... These stores may be sufficient for the first 6 to 9 months of life but will become depleted if iron supplementation does not occur. Ongoing iron intake is required throughout the first 15 years of life in order to reach adult levels.

BENEFITS OF BREASTFEEDING

1. Infant Increased bonding with mother
2. Immunologic protection
3. Breast milk has anti-infective properties
4. Decreased incidence and severity of diarrhea .
5. Decreased incidence of asthma, otitis media.
6. Prevent meningitis, urinary tract infection Possible enhancement of cognitive development
7. Decreased incidence of obesity in later childhood
8. Maternal Increased bonding with infant

9. Lessens maternal blood loss in the postpartum period
10. Decreased risk of ovarian and premenopausal breast cancer
11. Reduced incidence of pregnancy-induced, long-term obesity Possible delay of return of ovulation in some women.

The first —milk to be produced by the breasts is termed colostrum. It is produced for the first 2 to 4 days after birth. Colostrum is a thin, watery, yellowish fluid that is easy to digest, as it is high in protein and low in sugar and fat . .

Colostrum: Is complete nutrition and all that is needed by the newborn for the first 2 to 4 days of life.. By day 10 after birth, mature breast milk is produced. Mature breast milk has a slightly bluish color and appears thin.

INFANT STAGE

INFANT STAGE

It is the period which starts at the end of the first month up to the end of the first year of age. Infant's growth and development during this period are rapid .

Physical growth of normal infant Weight :

The infant gains :

- Birth to 4 months → $\frac{3}{4}$ kg /month
- 5 to 8 months → $\frac{1}{2}$ kg / month
- 9 to 12 months → $\frac{1}{4}$ kg /month

The infant will double his birth wt by 4-5 months and triple it by 10- 12 months of age.

Height

Length increases about 3 cm /month during the 1st 3 months of age, then it increases 2 cm /month at age of 4-6 months, Then, at 7 – 12 months, it increases 1 ½ cm per month

Head circumference

It increases about 2 cm /month during the 1st 3 months, Then, ½ cm/month during the 2nd 9 months of age.

Posterior fontanel closes by 6-8 weeks of age.

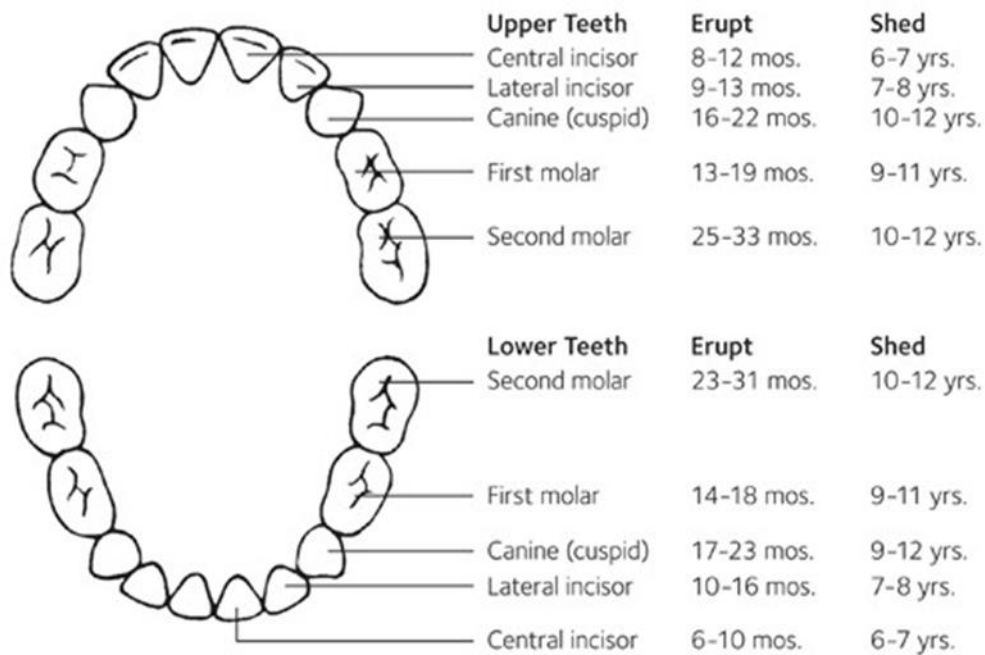
Anterior fontanel closes by 12-18 months of age.

Chest circumference

By the end of the 1st year, it will be equal to head circumference.

Dentition

Eruption of teeth starts by 5–6 months of age. It is called "Milky teeth" or "Deciduous teeth" or "Temporary teeth".



COMMON INFANTS NEEDS

1. Love and security
2. Feeding (breast feeding)
3. Immunization
4. Sleep ,rest and quit environment
5. Safety measurement accident prevention
6. Playing
7. Bathing and clothing
8. Sucking pleasure
9. Fresh air and sunshine
- 10.Dental care

Nutrition of infant

Nutrition is an essential component for healthy growth and development. Human milk is the preferred form of nutrition for all infants. Breastfeeding provides the infant with micronutrients, immunologic properties, and several enzymes that enhance digestion and absorption of these nutrients.

Infant Feedings

(Birth to 1 Month)

- Breast every 2 to 3 hours
- Bottle every 3 to 4 hours

(Two to 4 Months)

- Breast or bottle every 3 to 4 hours

(Four to 6 Months)

- Breast or bottle four to six times per day

(Six to 8 Months)

- Iron-fortified rice cereal
- Breast or bottle four times per day.

(Eight to 10 Months)

- Finger foods (when the pincer grasp is present, the child is developmentally ready for finger foods) .
- use cup with formula, breast milk, juice, or water
- Breast or bottle four times per day

(Ten to 12 Months)

- Self-feeding with fingers and spoon
- Most table foods allowed
- Breast or bottle four times per day

• **Playing and toys of infant**

***Playing** :Is the job of the infant .

***Kind of play in infancy stage is (solitary play) . An 8-month**

-old infant is sitting on the floor, grasping blocks and banging them on the floor .

-Infants spend much of their time engaging in solitary play, or playing by themselves .

Sleep patterns vary among infants.

Generally by 3 months of age, most infants sleep is 15 total hours and approximately 1- to 2-hour naps during the day. Consolidation of nocturnal sleep hours occurs during the first 12 months, with decreasing daytime sleep and increasing nighttime sleep (approximately 11-7 hours) by 1 year of age.

COMMON INFANTS ACCIDENTS AND INJURIES

- ✚ Aspiration (small things)
- ✚ Burn
- ✚ Falls
- ✚ Injury by sharp instruments
- ✚ Drowning
- ✚ Suffocation
- ✚ Poisoning
- ✚ Motor damage

