Al-Mustaqbal University College

Department of Nursing

كلية المستقبل الجامعة

قسم التمريض

Lecture 5

Growth and Development of the newborn

Assessment of normal growth & Development of the Infant

- A number of methods have been proposed to assist the nurse to evaluate that growth progresses in a regular and orderly sequence.
- Tables, charts and grids are available to facilitate the nurse's evaluation of physical growth.
- In addition to the observation over a period of time, the periodic assessment of infants and children permits the early detection of growth deficiencies and pathologic processes, both organic and psychological.

[1]. GROWTH DURING THE INTRAUTERINE PERIOD.

The period of intrauterine life may be divided into two principle phases:

- **The embryonic period**: this is considered to be the **first 8 weeks** during which the ovum is fertilized and beginning of the period of organogenesis.
- **The fetal period: 8^{th} to 40^{th} or 42^{nd} week** of gestation is distinguished by rapid growth and elaboration of function.

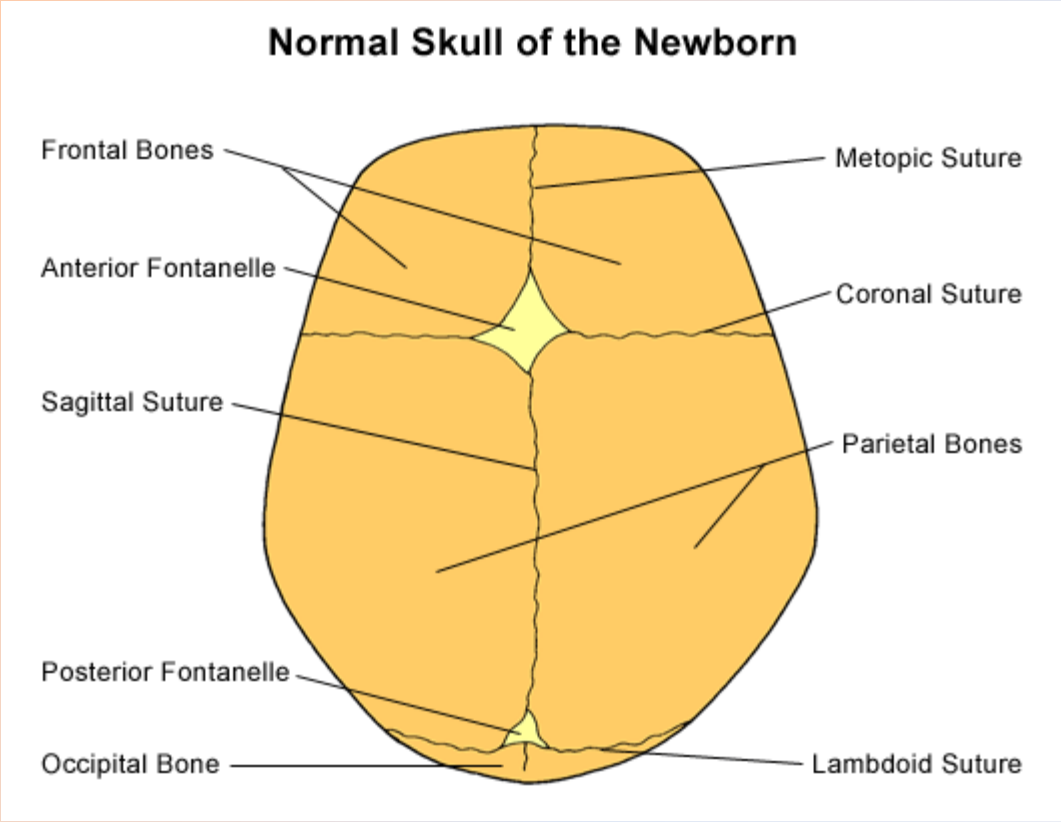
[2]. Growth during the postnatal period. (Newborn Assessment)

1. Growth of head:

- The posterior fontanel closes at 1-2 months, Triangular shape
- The anterior fontanel closes at 12-18 months.
- At birth: 3.5 - 4 cm. Diamond shape.
- At birth, head circumference is 33-35 cm.
- At the end of the first year, it is 45 cm.
- At the second year, it is 48 cm.
- At the third year, it is 49 cm.
- At the fifth year, it is 50 cm. At the seventh year, it is 52 cm. At twelve years, it measures 53 cm.
- And the adult head circumference is 55 cm.

Head circumference measurement

Main fontanels on the head of the newborn



GROWTH OF CHEST AND ABDOMEN:

2. The chest and abdomen circumferences are equal in the first one to two years of life.

- The abdomen tends to be prominent in infants and young children.

3. Chest Circumference:

- At birth, head circumference is 2cm larger than chest circumference.
- Between age of 1 and 2 years both are equal.
- After 2 years, the chest is larger than the head.
- N.B: Chest is usually measured at nipple line, with the subject sitting in the midway between inspiration and expiration.

4. Growth in length:

- During the first year in life, the infant gains in length roughly 2 cm/month during the first 6 months and 1.5 cm in the second 6 months.
- ***At birth: 48-50 cm**
- ***At one year: 75 cm** (increase by about 25 cm in 1st year)
- ***At two years: 87 cm** (increase by about 12 cm in 2nd year)
- ***after 2nd year: 5cm**
- A formula can be used after the first year to estimate the length of the child **(Age in years x 5)+80=length in centimeters**.

5. Growth in weight:

- There is an initial phase of loss of weight after birth for the following factors:
- 1. Withdrawal of hormones from mother.
- 2. Loss of excessive extra cellular fluid.
- 3. Passage of meconium (faeces) and urine.
- 4. Limited food intake.

- Most full terms regain their birth weight by the age of ten days. Then the weight gain averages approximately 20 – 25 gm/day.
- Roughly the newborn gains ¾ kg/month during the first four months of life, ½ kg/month during the second four months and ¼ kg/month during the last four months of the first year.
- Thus the average birth weight (3.25 kg) is
- **doubled** between the 5th – 6th months
- **tripled** by the end of the first year.
- A formula can be used after that to calculate the weight: **(Age in years X 2) + 8 = Weight in kg.**

B. Physiological Growth:

Vital Signs:

- **a - Temperature**: At birth newborn infant's temperature is slightly higher than the mother. It will drop immediately after birth in adjustment to delivery room temperature unless the newborn infant is kept warm immediately after birth.

  Temperature rises to normal within about 8 hours. Temperature of newborn infant is usually 35.5 to 37.5 °c.
- **b - Pulse:** 120 to 150 / min. It is usually rapid and irregular.
- **c - Respiration:** 30 to 60 / min. It is usually irregular in depth, rate and rhythm.
- d - Cry with no tears.

SENSES:

A - Touch: It is the most highly developed sense. It is most acute at lips tongue, ears and forehead.

b - Vision:-

- **Pupils react to light.**
- **Bright lights appear to be unpleasant to newborn infant**

c. 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 a cry or eye movement, cessation of activity and / or startle reaction.

d - Taste:

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

e - Smell:

Only evidence in newborn infant is his search for the nipple as he smells breast milk.

DEVELOPMENT:

A. - **Motor Development:**

- - His movements are random, diffuse and uncoordinated.
- - Lack muscular strength to hold head steady and erect.

- - Bodily functions and responses to external stimuli are carried out by reflexes.
- ** Reflexes: The reflexes such as: Moro-reflex, swallowing and gagging reflex. Sucking reflex, grasp reflex , tonic-neck reflexe.

MORO-REFLEX,

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 .

SUCKING REFLEX

- If the finger or nipple placed in the infant's mouth, the infant will suck.

SWALLOWING REFLEX

- When liquid moves into the mouth, the tongue moves it to the back of the mouth for swallowing.

Tonic neck reflex

The tonic neck reflex, 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).

B- Cognitive Development:

- The cognitive (intellectual) development of newborn infant is difficult to understand or observe it.

C- Emotional Development:

- Newborn infant expresses his emotion just through cry for hunger, pain or discomfort sensation.

D- Social Development:

- Cry is his contact with environment; to communicate his physiological needs as hunger, throaty sounds show interest in human face.

HAVE A NICE DAY