Human Growth and Development

Lecture 1

Introduction:

- **Pediatric:**
  - Paediatric means the study and care of children in sickness and health.

- **Pediatric nursing:**
  - Paediatric Nursing is defined as the science and art of giving nursing care to children form birth through adolescence with emphasis on physical, mental, social, and emotional growth.

Introduction:

⦿Functions of pediatric nursing:

- Nursing process: assessment, diagnosis, planning, intervention, and evaluation.
- Physical care: Hygiene, performance of procedures, administration of medications and treatment, maintenance of medical regimen, maintenance of safe and supportive environment and care of equipment.
- Psychosocial: emotional support of child and parents, prep[are child and parents for procedures, …
- Teaching: illness, procedures, discharge.

Introduction:

- **Growth:**
  - The increase in physical size of the whole body or any of the parts of the body. It can be measured in centimetres, or kilograms.

- **Development:**
  - Refers to progressive increase in skills and capacity of functions.

Stages of human growth and development:

- ***Prenatal:***
  - **Embryonic stage**: First 12 weeks of gestation.
  - **Fetal stage:** from 12 to 40 week of gestation. Period of rapid growth and development

- ***Perinatal:*** from 20 week of fetal life to 28 day after delivery

Stages of human growth and development:

⦿ *Postnatal:*

- **Neonatal period:**
  - From birth to one month.
  - It is the most critical period during which the newborn adapts to extrauterine environment.
  - It is mostly affected by prematurity, congenital anomalies, birth trauma, cross infections
- **Infancy:**
  - From 1 month to one year.
  - Period of most rapid growth and mental development.
  - It is most affected by infectious disease and nutritional disorders.

Stages of human growth and development:

- ***Postnatal:***
  - **Early childhood (toddlers or preschool age)**:
    - 1-4 years.
    - Period of weaning and exploration of outside world.
    - Child is thus exposed to accidents and household poisons, nutritional disorders, and infectious diseases.
  - **Late childhood (school age):**
    - 5-12 years.
    - Child is mostly exposed to accidents and infections, cardiac diseases as rheumatic fever and bacterial endocarditis, psychological and emotional problems, and malignancies as leukemias, lymphomas…
  - **Adolescence:**
    - It is the passage from childhood to puberty and adulthood

Assessment of normal growth:

⦿*Growth of the head:*

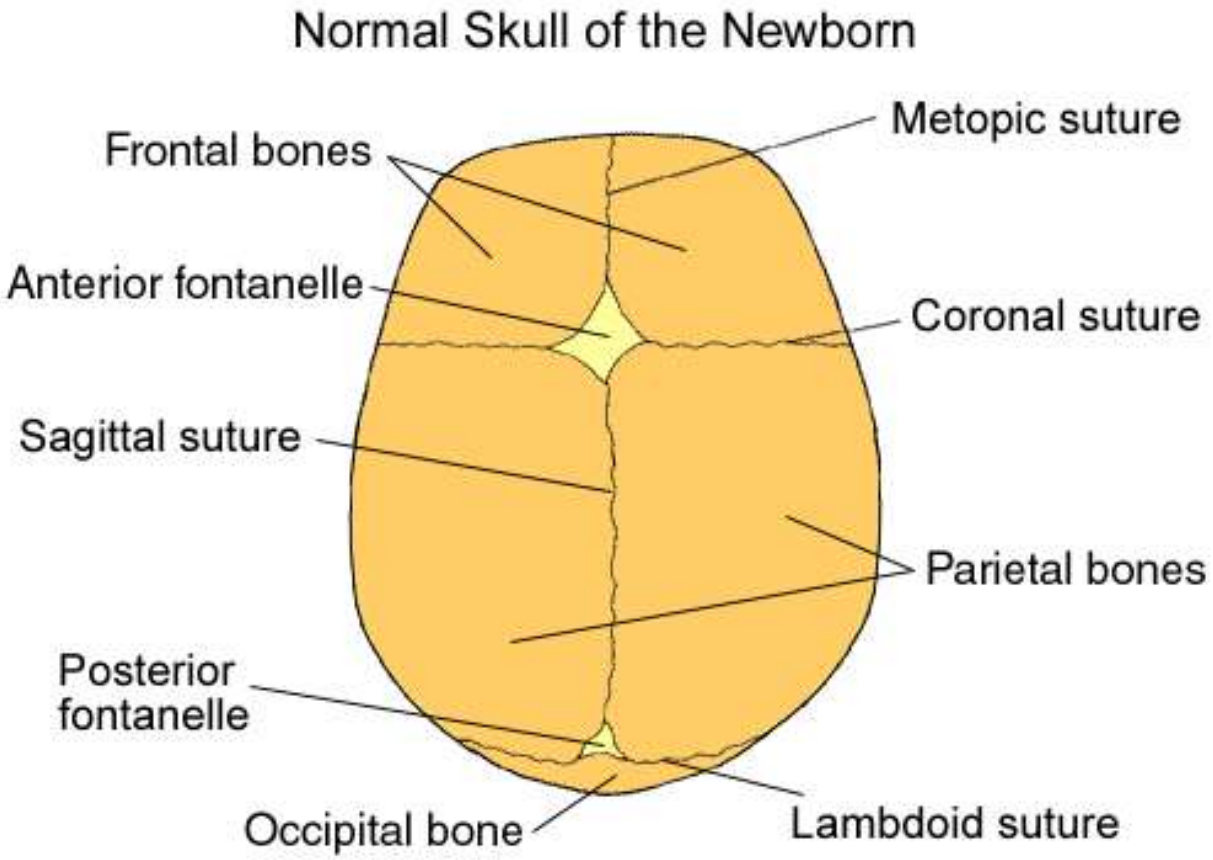
– Fontanel:

- A soft space in the skull of an infant before the skull has completely closed.
- There are two fontanels:

  - ***Anterior fontanel:***
    - The coronal, frontal and sagittal sutures meet.
    - It closes at 18 months.
  - ***Posterior fontanel:***
    - Lambdoid and sagittal sutures meet.
    - It closes at 2 month

Assessment of normal growth:

Growth of the head:



Assessment of normal growth:

⦿*Growth of the head:*

– Head circumference:

- At birth it is 35 cm. The adult head circumference is 55cm.
- Head Circumference increase by 1.5 cm (1/2 inch) monthly for first 6 months.

  - At birth 33-35cm
  - At 6 month 40cm
  - At 1 year 45cm
  - At 7 years 50cm
  - At 12 years 55cm

Assessment of normal growth:

- ***Growth of the chest and abdomen:***
  - The chest and abdomen circumferences are equal in the first four years of life.
  - The abdomen tends to be prominent in infants and young children.
  - Chest circumference:
    - At birth, head circumference is 2cm larger than chest circumference.
    - Between age 1 and 2 years both are equal.
    - After 2 years, the chest is larger than the head.

Assessment of normal growth:

- ***Growth in length:***
  - At birth: 50cm.
  - Height Gain of 2.5 cm (1 inch) monthly for first 6 months.
  - At one year: 75 cm (increase about 25 cm in the first year.
  - At 2 years: 87 cm (increase about 12 cm in the second year)
  - After the second year: the child increase 5cm/year

Assessment of normal growth:

- ***Gain in weight:***
  - At birth: 2.5 – 4 Kgm.
  - There is an initial phase of loss of weight after birth and most full terms regain their birth weight by the age of ten days. Then the weight gain averages approximately 20 – 25 gm/day.
  - The average birth weight (3.25) is doubled between the 4^{th} – 5^{th} month and tripled by the end of the first year.

Assessment of normal growth:

- ***Teething:***
  - There are 20 milk teeth and 32 permanent teeth.
  - **Milk Teeth:**
    - Also known as deciduous teeth, baby teeth, temporary teeth and primary teeth
    - They develop during the embryonic stage of development and erupt during infancy.
    - They are usually lost and replaced by permanent teeth.
    - ***Eruption of the milk teeth:***
      - » They start to erupt between the 5^{th} and 7^{th} months.

Assessment of normal growth:

Eruption of the milk teeth:

Eruption of the milk teeth	Number	Month
Lower central incisors	2	5 – 7
Upper central incisors	2	6 – 8
Upper lateral incisors	2	7 – 10
Lower lateral incisors	2	8 – 11
First deciduous molars	4	10 – 16
Canines	4	15 – 20
Second deciduous molars	4	20 – 30
Total	20	

Assessment of normal growth:

⦿ *Teething:*

– Permanent Teeth:

- There are thirty-two permanent teeth, consisting of six maxillary and six mandibular molars, four maxillary and four mandibular premolars, two maxillary and two mandibular canines, four maxillary and four mandibular incisors.

- ***Eruption of the permanent teeth:***
  - The first permanent tooth usually appears at around six years of age.
  - Up to the age of thirteen years twenty-eight of the thirty-two permanent teeth will appear.

Assessment of normal growth:

Eruption of the permanent teeth:

Eruption of the permanent teeth	Number	Year
First molar	4	6 – 7
Central incisors	4	6 – 8
Lateral incisors	4	7 – 9
Canines	4	9 – 11
First premolar	4	10 – 12
Second premolar	4	11 – 13
Second molar	4	12 - 13
Third molar (wisdom molar)	4	17 – 21
	32	

Assessment of development:

- The sequence of development is the same in all children, but its rate varies from child to child.

  - The normal development is usually classified into four major fields of behaviour:
    - ***Motor behaviour:***
      - ***Gross motor skills*** involve the large muscles of the body that enable such functions as walking, kicking, sitting upright, lifting, and throwing a ball.

      - ***Fine motor skills*** involve the small muscles of the body that enable such functions as writing, grasping small objects, and fastening clothing.

Assessment of development:

- ***Sensory-motor behaviour.***

- ***Language behaviour:*** facial expression, movements.

- ***Personal-social behaviour***: social reaction of child with his surrounding and relatives.

Assessment of development:

- **Gross motor development:**
  - Creeps and pulls self upward --------at 9-10th months.
  - Stands unsupported----------at 11 months.
  - Walks supported----------at 12 months.
  - Walks well, crawling upstairs--------at 15 months

- **Fine motor development:**
  - Turn head to sound, brings hands together----at 4 month
  - Able to reach object by hand and get it--------at 5 months
  - Can pick small objects ----------at 11 months

Assessment of development:

- **Socialization and vocalization:**
  - Has social smile and eyes follow any person or object---at 2 months.
  - Discriminate between strangers and familiar persons---at 7 months.
  - Responds to own name and smiles at images in mirror---at 10 months

- **Cognitive and language development:**
  - Laughs loudly----------at 4months.
  - Recognize mother and chews----------at 6 months.
  - Says papa, ma-ma discriminately.----------at 10 months.
  - Says 2-3 words, understands several wards-----at 12 months.

Assessment of development:

- **Causes of delayed sitting and walking:**
  - Familial features.
  - Rickets, mental suabnormality, cerebral palsy.
  - Poliomyelitis, muscular dystrophy.
  - Malnutrition, blindness, congenital heart disease.

- **Causes of delayed speech:**
  - Familial features, environmental factors, autism.
  - Bilingualism, mental subabnormality, deafness, unexplained.

Promoting optimum growth and development:

- ***Nutrition:***
  - Breast milk or formula is the most desirable food for the infant during the first 6 months, followed by gradual introduction of solid food during the second 6 months. Whole milk is not recommended until after 12 months.

- ***Immunizations:***
  - Recommended routine immunizations include those for hepatitis B virus, diphtheria, tetanus, pertussis, polio, measles, mumps, rubella, chickenpox and Recommended immunizations for selected groups of children are influenza virus, hepatitis A, pneumococcal and meningococcal vaccines.

Promoting optimum growth and development:

- ***Prevent injuries:***
  - Because injuries are a major cause of death during infancy, parents should be alerted to aspiration of foreign objects, suffocation, falls, poisoning, burns, motor vehicle injuries and bodily damage, as well as preventive actions needed to make the environment safe for infants.

  - The period from 12 to 36 months of age, is a time of intense exploration of the environment as children attempt to find out how things work and how to control others through temper tantrums, negativism and obstinacy. It is an extremely important period for developmental achievement and intellectual growth.

- ***Dental Care:***
  - Dental care continues to be important; dental problems include caries, peridontal disease, malocclusion and dental injury.