

جامعة المعارف

كلية التمريض

المرحلة الثالثة

النمو والنماء- المحاضرة الأولى

الدكتور

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دكتوراه تمريض الأطفال

Human Growth and development

Part 1

Pattern of growth and development

Growth: it is increase in body mass .

Or: It is the increase in physical size of the whole body or any of the parts of the body. Because of cell division and synthesis of proteins. It causes a quantitative change in the child's body. Growth can be measured accurately in inches, centimeters, pounds or kilograms.

Development: It refers to progressive increase in skills and capacity of functions. It causes a qualitative change in the child's functioning. Development can be measured but its measurements are not so accurate as growth since it is measured through observation.

Principles of growth and development:

1. Growth and development are continuous processes.
2. Each child has his own rate of growth and development.
3. Both growth and development are synchronous. Different body parts and developmental areas develop at different rates. Each body part has its own time to grow.
4. All areas of growth and development are interrelated (physical, psychosocial, cognitive and motor) to meet the child's basic physiological needs.

5. Children's behavior is directed towards competency.
6. Growth and development progress from midline towards periphery.
7. Growth and development occur in an orderly sequence.
8. The direction of development is cephalocaudal, i.e. the infant controls his head before he can sit, and crawls before he can walk.
9. General to specific: at the beginning all faces and sounds appear same to him/her, then starts to distinguish mother's face and sound.
10. Development is relative.

Factors affecting growth and development:

- 1. Hereditary factors:** These are responsible for the characteristics of :
 - certain anomalies,
 - individual pattern of growth,
 - some diseases
 - certain types of short stature.
- 2. Congenital defects:** These may be due to heredity or abnormal environment during embryonic life.
- 3. Endocrine factors:** These can produce normal variations and cause growth variation.
- 4. Environmental factors such as:**
 - ❖ the mother's nutritional status,
 - ❖ exposure to infectious diseases and pathological conditions
 - ❖ the socioeconomic conditions of the family affect the health of the embryo, infant, and child.

5. **Nutritional factors:** Growth of the baby depends on adequate consumption and proper utilization of suitable types of food. Specific deficiencies cause alterations in growth and development.
6. **Activities:** Normal growth and development depend on normal activities. A bedridden child would not grow as much as an active one.
7. **Illness and injuries:** During birth, may cause a permanent damage to vital organs.

Types of Growth:

1. **Physical growth** such as, weight, height, head and chest circumferences.
2. **Physiological growth** such as, vital signs, senses (touch, hearing, smell, vision, and taste).

Types of Development:

1. **Cognitive development** (intellectual development e.g. reasoning, mental thinking...etc)
2. **Emotional development** e.g. loves, fear ...etc.
3. **Social development** e.g. self-concept, friendship, and development of senses such as sense of trust...etc.

Stages of Growth and Development

1. **Prenatal period : From conception to birth:**
 - ❖ Germinal period: 1st two weeks of gestation (Zygote)
 - ❖ Embryonic period: 2 – 8 weeks (Embryo)
 - ❖ Fetal period: 8 weeks – birth (Fetus)
2. **Infancy: Birth to 12 months**

❖ Neonate : Birth to 1 month

❖ Infancy : 1 month to 12 months

3. Early Childhood: 1 to 6 years

❖ Toddler : 1-3 years

❖ Preschool : 3-6 years

4. Middle Childhood: 6 to 11 or 12 years School age 6 to 12 years

5. Later Childhood: 11 to 19

❖ Prepubertal 10 -13 years

❖ Adolescence 13 years to approximately 18 or 19 years

6. Adulthood -Young adulthood from 19- 25 years

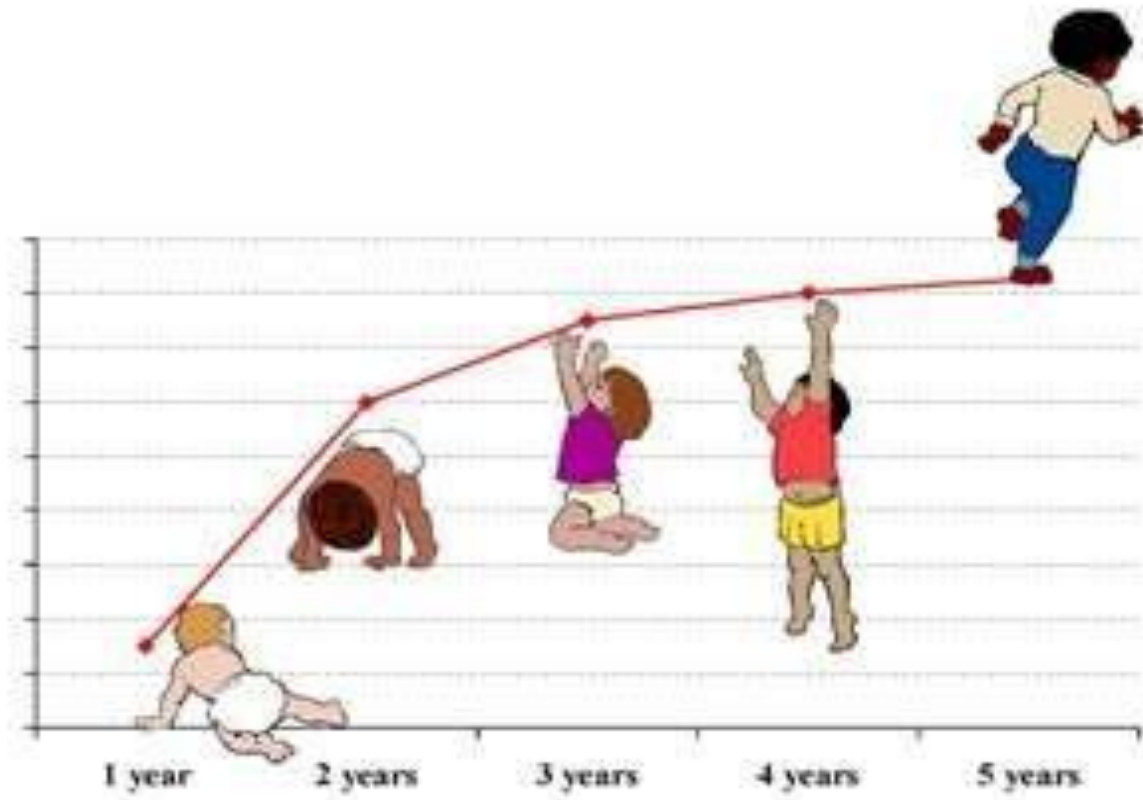
7. Adult from 26 – 40 years .

❖ Maturity from 41 years - and above

8. Old age 65 years and above.



Child Growth (Image: WHO)



Physical growth:

Body Weight Weight:

• Average birth weight 3 kg lose 10% body weight regain BW by 10 days gain at 25-30 gm/day for 1st 3 months 400gm/month till end of 1st year.

- ❖ BW doubles by 5 months
- ❖ Trebles by 1 year.

- ❖ 4 times by 2

- ❖ 6 times at 5 yrs.
- ❖ 10 times at 10 yrs.
- ❖ gains 2 kg/yr between 3-7 yrs.
- ❖ 3 kg/yr after that till pubertal

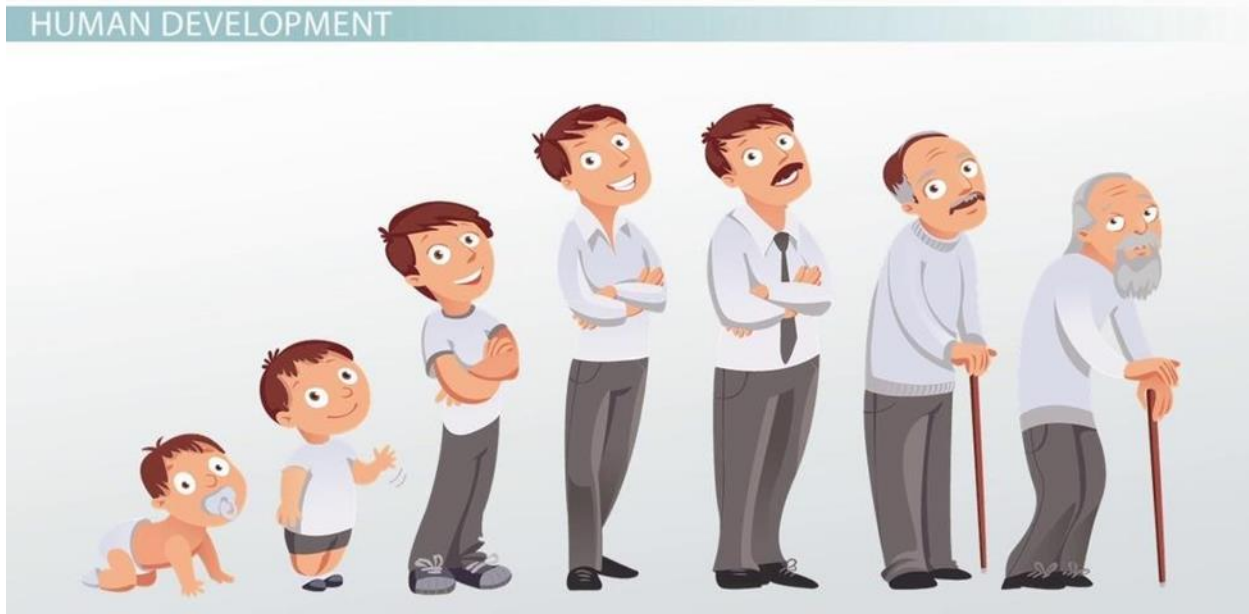
Height:

- ❖ 50 cm at birth
- ❖ 60 cm at 3 months
- ❖ 75 cm at 1 yr.
- ❖ 100 cm at 4 yrs.
- ❖ Gain 5 cm/yr. till 10 yrs.

VELOCITY OF GROWTH :

- ❖ Serial measurements of growth parameters over a period of time
- ❖ One time measurement does not indicate the rate of growth
- ❖ An abnormal percentile may only present once the factors retarding growth are profound or e long a for time long

- ❖ Plotting growth over a period of time provides a good epidemiologic tool for early detection of malnutrition, infections & growth disorders.



Four areas of development includes:











- Gross motor
- Fine motor (adaptive)
- Social
- Language

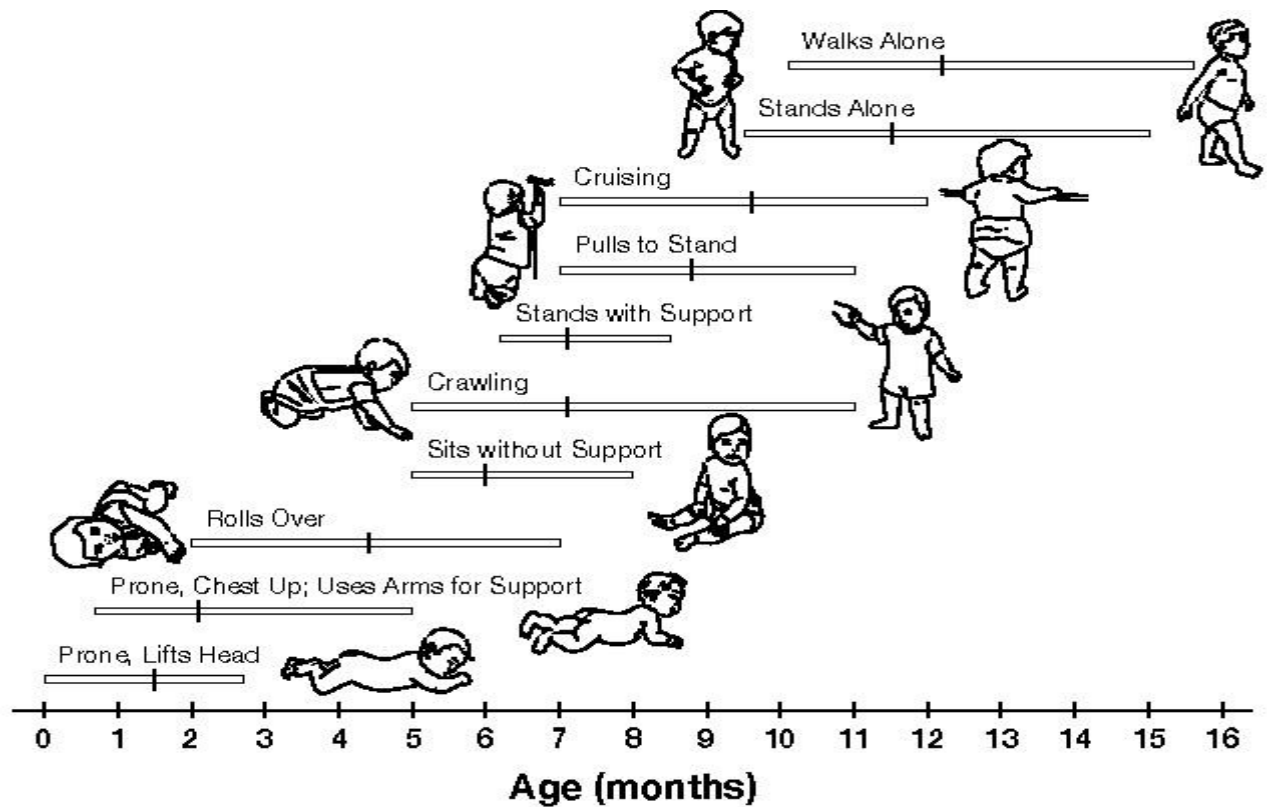
GROSS MOTOR : Involves control of child over his body. Tested in ventral suspension: Baby held in prone position and lifted off the bed. Newborn –head flops down 4-12 weeks–brings head to plane of body and then above plane of body.

Key Gross motor milestones

- 3 month–neck holding
- 5 month–sitting with support
- 8 month–sitting without support
- 9 month–standing with support
- 10 months –cruising
- 12 month–standing without support
- 14 month–walking without support
- 18 month–running
- 24 month–walking upstairs

Milestones of Motor Development

<p>3.2 months: rolling over</p> 	<p>3.3 months: grasping rattle</p> 	<p>5.9 months: sitting without support</p> 	<p>7.2 months: standing while holding on</p> 	<p>8.2 months: grasping with thumb and finger</p> 
<p>11.5 months: standing alone well</p> 	<p>12.3 months: walking well</p> 	<p>14.8 months: building tower of two cubes</p> 	<p>16.6 months: walking up steps</p> 	<p>23.8 months: jumping in place</p> 



FINE MOTOR OR ADAPTIVE MILESTONES:

Includes eye coordination, hand eye coordination, hand mouth coordination and manipulations with hands.

Tested with red ring, pen torch, red cubes (2.5 cm), pellet, cup with handle, spoon, book with thick pages, red pencil/crayon, paper, wooden blocks, doll, mirror.

PERSONAL & SOCIAL DEVELOPMENT:

- **1 month** -regards face of mother/caretaker
- **2 month** -social smile
- **3 month** –recognizes mother/caretaker
- **6 month** -enjoys mirror

•7-8 months -separation anxiety

•9 month -waves bye-bye

LANGUAGE DEVELOPMENT:

•1 month-turns head towards sound

•3-5 months-vowel sounds, gurgles

•6 month-monosyllables

•9 month-bisyllables

•10 month-understands spoken speech

•12 month-speaks 2 words with meaning

•18 month-20 words

•24 month-joins 2-3 words in a short sentence

•3 years-250 words

Developmental Delay:

❖ 3- Step for diagnosis :



Clinical



Screening tools



Psychometric scale

