GROWTH AND DEVELOPMENT

DEFINITION

- **GROWTH:** It is the physical maturation resulting an increase in size of the body and various organ

- **<u>DEVELOPMENT:</u>** Refers to a progressive increase in skills and capacity to function
- It is the process of functional and physiological maturation of the individual

- **<u>MATURATION:</u>** It is an increase in competence and change in behavior & ability to function at a higher level depending upon the genetic inheritance

DIFFERENCE BETWEEN GROWTH & DEVELOPMENT

Sl. no	GROWTH	DEVELOPMENT
1	Quantitative Changes	Qualitative changes
2	Measurable by means of inches/ cm/kg/pounds	Difficult to measure
3	Depends upon physical maturation	Depends upon functional maturation
4	Predictable	Not predictable

CONTD...

5	There is a deceleration and acceleration at the rate of growth	Progressive in nature
6	Growth is the product of increase in cell size & division	Dvt is the product of maturation & learning
7	Growth does not continue throughout the life. It stops when maturity has been attained	Dvt is a continuous process. It does not end with the attainment of maturity
8	Narrow term	Wider & comprehensive term

IMPORTANCE OF LEARNING GROWTH AND DEVELOPMENT

- To learn what to expect from a particular child to a particular age.
- To assess the normal growth and development of children.
- To detect deviations from normal growth and development and to understand the reasons of particular conditions and illnesses.
- To ascertain the needs of the child according to the level of growth and development.
- To plan and provide holistic nursing management to the child, based on developmental stages.
- To teach and guide the parents and caregivers to anticipate the problems and to render tender loving care to their children.
- To develop a rapport with the child to enhance the provision of health care and to help to build a healthy lifestyle for optimum health for the future.

METHODS TO STUDY GROWTH AND DEVELOPMENT

Cross-sectional method

- A group of children's characteristics are measured at a time and generalizations will be made based on observations.

Longitudinal method

- Individual child is measured at fixed intervals throughout their stages of growth and development over a period of time.

PRINCIPLES OF GROWTH AND DEVELOPMENT

- Growth and development is continuous and orderly processes with individual difference and are unique to each child.
- Growth and development proceeds by stages and its sequence is predictable and same in children but there may be difference in time of achievement.
- There is coordination between increase in size and maturation of organ and system.
- They proceed in cephalocaudal (i.e., from head down to the tail) and proximodistal (i.e., from the centre or midline of the body to the periphery) direction.

Contd…

PRINCIPLES OF GROWTH AND DEVELOPMENT

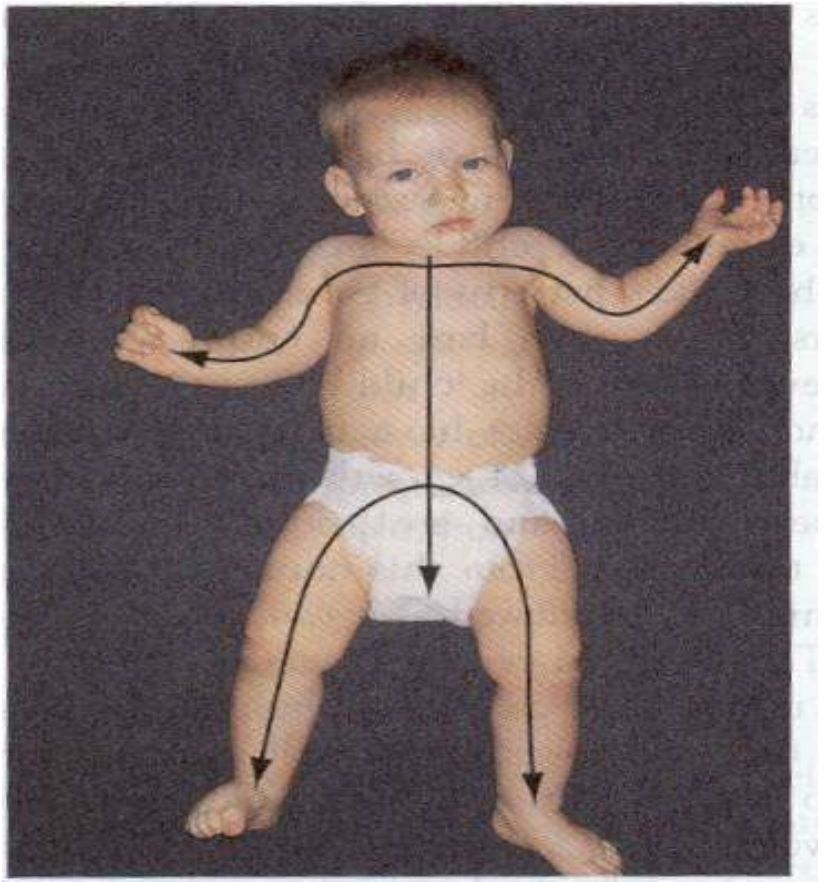
- Initial mass activities and movements are replaced by specific response or actions by the complex process of individualized changes.
- Rate of growth and development is interrelated and rapid in infancy and in puberty but slow in preschool and school age.
- Growth and development depend on combination of many interdependent factors especially by heredity and environment.

Growth Patterns

- The child's pattern of growth is in a head-to-toe direction, or cephalocaudal, and in an inward to outward pattern called proximodistal.

- Cephalocaudal Development
  - Upper part of the head to the lower parts of the body
- Proximodistal Development
  - Trunk outward – from body's central axis toward periphery

Growth Pattern



STAGES OF GROWTH AND DEVELOPMENT

Prenatal

- Ovum-0-14 days after conception
- Embryo 14 days to 8 weeks
- Fetus 8 weeks to birth

Postnatal period

- Neonate from birth to 4 weeks of life
- Infancy-First year of life
- Toddler 1-3 years
- Preschooler (early childhood)3-6years
- School going child (middle childhood)

6-12 years

Contd…

STAGES OF GROWTH AND DEVELOPMENT

Adolescent from puberty to adulthood

- Prepubescent (early adolescent/late childhood)
  10-12 years (girls)
  12-14 years (boys)
- Pubescent (middle adolescent)
  12-14 years (girls)
  14-16 years (boys)
- Postpubescent (late adolescent)
  14-18 years (girls)
  16-20 years (boys)

Adulthood

- Early adulthood 20-40 years
- Middle adulthood 40-60 years

Old age 60 & above

FACTORS INFLUENCING GROWTH AND DEVELOPMENT

- HEREDITY
- Sex
- Racial and national characteristics
  - Race
  - Nationality
- ENVIRONMENT
- Prenatal environment
  - Harmful prenatal factors

Contd…

FACTORS INFLUENCING GROWTH AND DEVELOPMENT

- Postnatal environment
- External environment
  - Cultural influences
  - Socioeconomic status of the family
  - Nutrition
  - Climate and season
  - Deviations from positive health
  - Exercise
  - Ordinal position in the family

Contd…

FACTORS INFLUENCING GROWTH AND DEVELOPMENT

- Internal environment
  - Intelligence
  - Hormonal influences
    - Somatotropic hormone (STH) or growth hormone (GH)
    - Thyroid hormones
    - Hormones that stimulate the gonads- The adreno-corticotropic hormone (ACTH)
  - Emotions

PHYSICAL GROWTH AND DEVELOPMENT

Physical growth and development can be divided into 3 areas:

- Biologic growth
- Motor development
- Sensory development

BIOLOGIC GROWTH

- **Changes in general body growth:**

- Changes result from different rates of growth in different parts of the body during consecutive stages of development.
- For example, the infant's head constitutes 1/4th of the entire length of the body at birth, whereas the adult's head is only 1/8th of the body length.

- **Length or height:**

- Yearly increments in height diminish from birth to maturity.
- The periods of most rapid growth are infancy and puberty.

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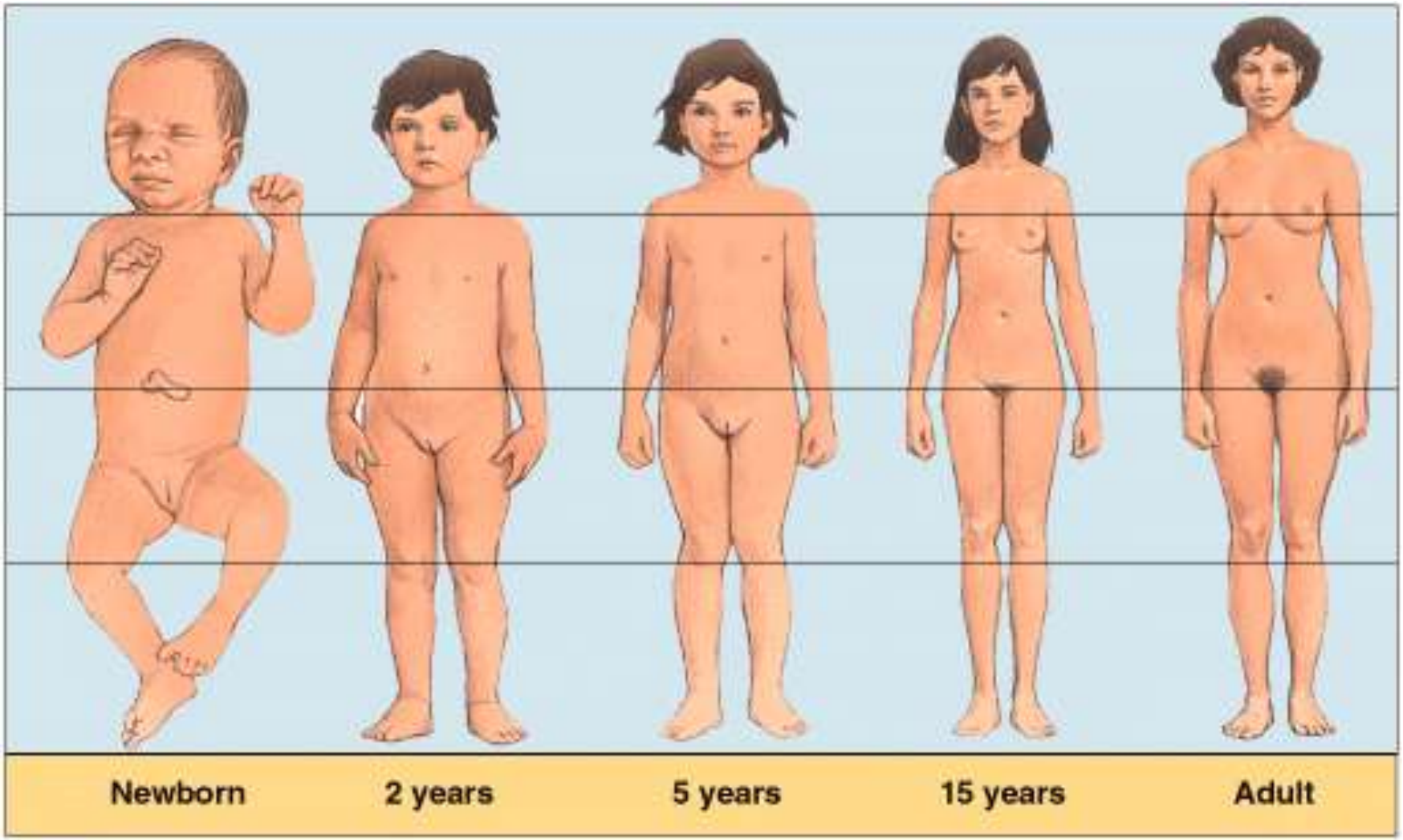
Changes in body proportion from birth to physical maturity



BIOLOGIC GROWTH

- **Weight:**

- Weight is influenced by all the increments in size and is probably the best gross index of nutrition and health.
- Normal limits vary widely for each year of childhood.
- Excess weight in relation to the height and pelvic diameters is as abnormal as being underweight.

- **Head circumference:**

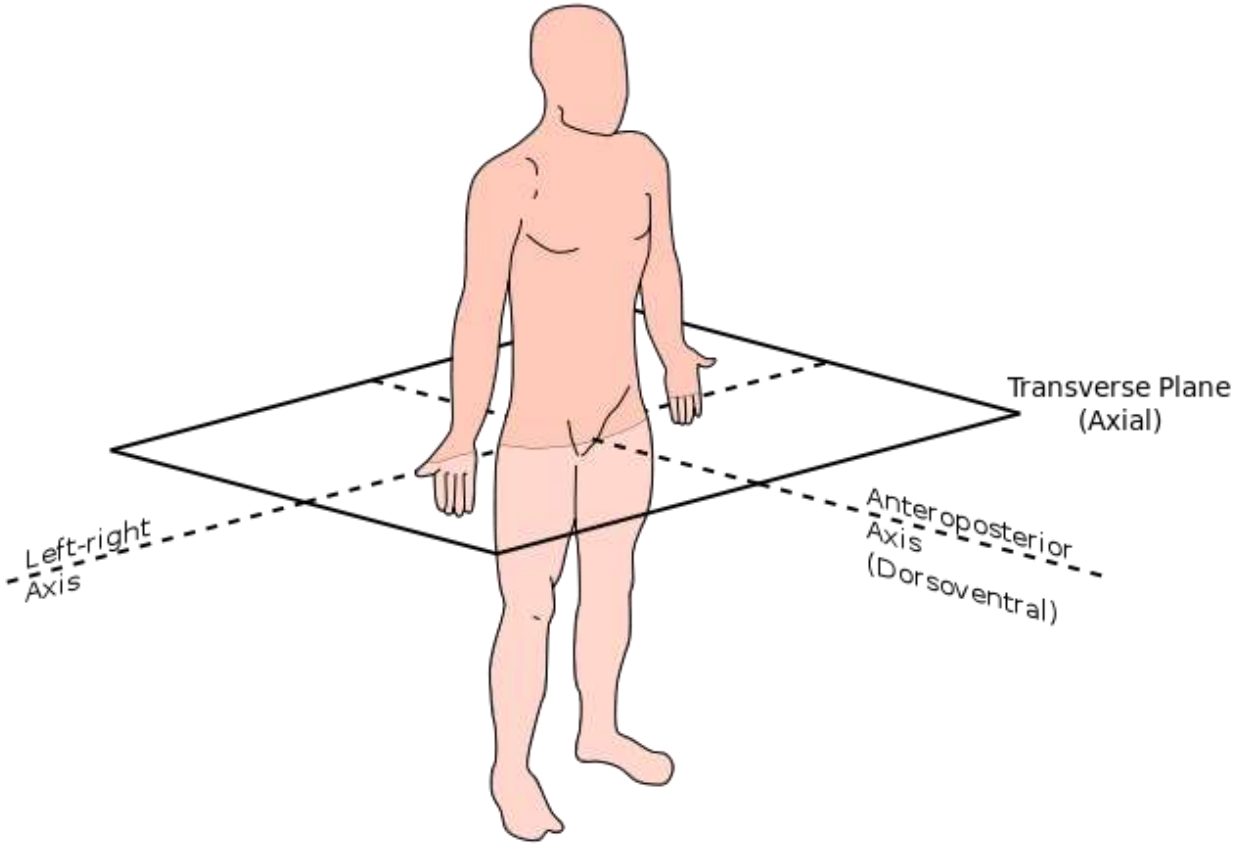
- The circumference of the head is an important measurement since it is related to intracranial volume.
- An increase in circumference permits an estimation of the rate of brain growth.

Contd...

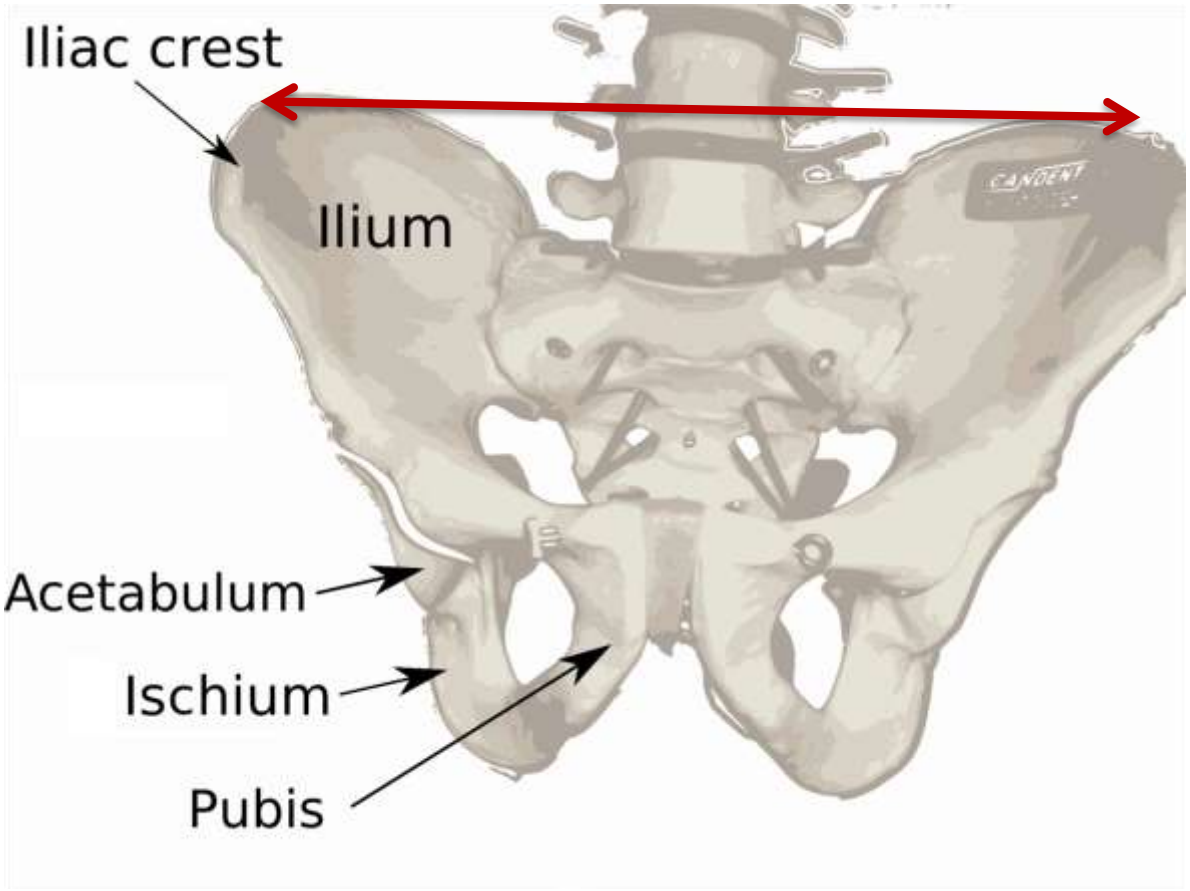
BIOLOGIC GROWTH

- **Thoracic diameter:**
- Chest measurements increase as the child grows and the shape of the chest changes.
- At birth the transverse and anteroposterior diameters are nearly equal.
- The transverse diameter increases more rapidly than does the anteroposterior diameter- i.e., the width becomes greater than the depth.
- **Abdominal and pelvic measurements:**
- The abdominal circumference is not fixed by a bony cage as is the chest; consequently it is affected by the infant's nutritional state, muscle tone, gaseous distension, and even the phase of respiration.
- The *pelvic bicristal diameter* is not affected by variations in the posture and musculature and is good index of a child's slenderness or stockiness.

TRANSVERSE DIAMETER



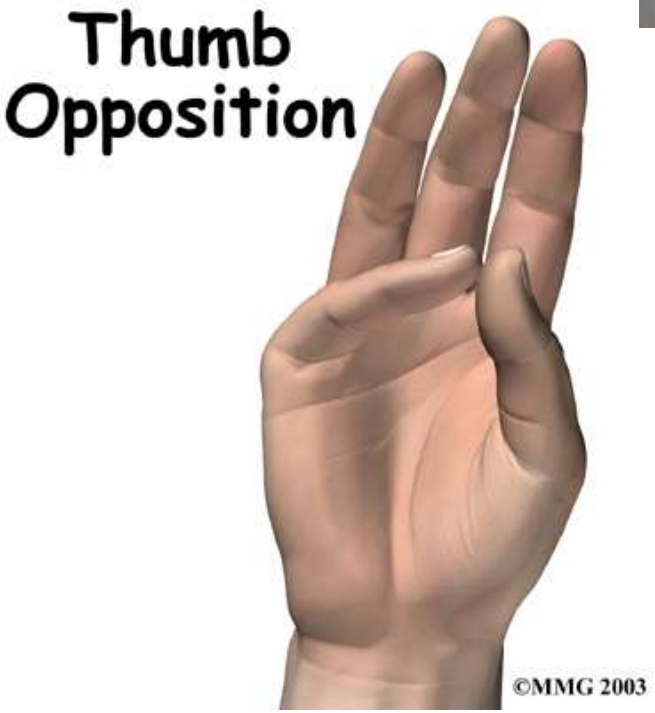
PELVIC BICRISTAL DIAMETER



MOTOR DEVELOPMENT

- **Motor development** depends on the maturation of the muscular, skeletal, and nervous systems.
- It is usually termed as gross and fine.
- **Gross motor development-** describes the acquisition of increasing the mobility and independent locomotion.
- Gross motor activities include turning, reaching, sitting, standing, and walking.
- **Fine motor development** evolves as the reflexes give way to the acquisition of motor dexterity.
- As the neural tract matures, reflexes disappear and are replaced by purposeful activities.
- The activities include, using the hands and fingers for thumb apposition, palmar grasp, release, pincer grasp, so on.

Palmar grasp



Pincer grasp

SENSORY DEVELOPMENT

- Sensory system is functional at birth, the child gradually learns the process of associating meaning with a perceived stimulus.
- Most acute initially at birth are the senses of *taste and smell*.
- *Touching* a neonate results in total body response.
- As myelinization of the nervous system is achieved, the child is able to respond to specific stimuli.
- The visual system is the last to mature, at about 6 to 7 years.

DEVELOPMENT

- The development of children can be divided into several areas:
  - Intellectual development
  - Moral development
  - Emotional development
  - Sexual development
  - Social development
  - Language and speech, and
  - Spiritual development

THEORIES OF DEVELOPMENT

- Intellectual development- Jean Piaget
- Moral development- Jean Piaget & Lawrence Kohlberg
- Emotional development- Erik H. Erikson
- Development of Sexuality- Sigmund Freud
- Spiritual development- James W. Fowler

EMOTIONAL DEVELOPMENT

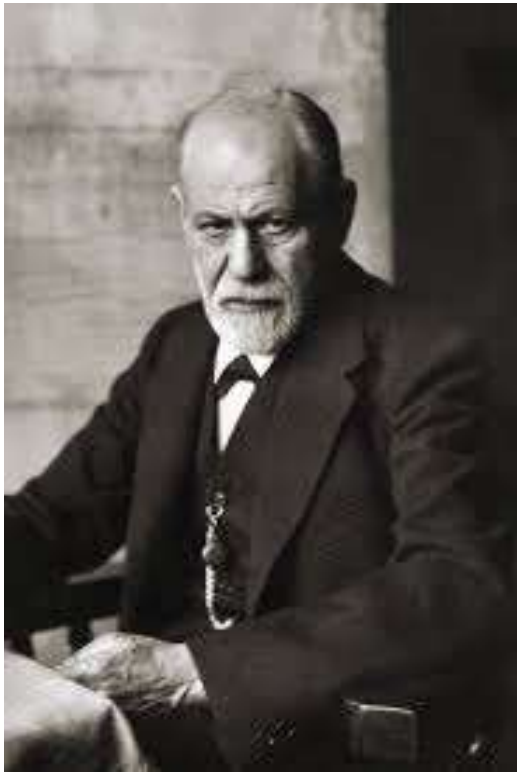
- Psychosocial or Emotional development was developed by Erik H. Erikson. He was a German-born American developmental psychologist and psychoanalyst.

EMOTIONAL DEVELOPMENT

Stage	Task	Negative counterpart
Infancy	Trust	Mistrust
Toddler	Sense of Autonomy	Doubt and shame
Preschool	Sense of Initiative	Guilt
School age	Sense of Industry	Inferiority
Early adolescent	Sense of Identity	Identity diffusion/ Role confusion
Late adolescent	Sense of Intimacy	Isolation

SEXUAL DEVELOPMENT

- The theory of Development of Sexuality was developed by Sigmund Freud, was an Austrian Neurologist, who became known as the founding father of psychoanalysis.



SEXUAL DEVELOPMENT

Stage	Psychosexual stage
Infancy	Oral
Toddler	Anal
Preschool	Phallic Boys- Oedipal complex Girls- Electra complex
School age	Latency
Adolescence	Pubescent

SPIRITUAL DEVELOPMENT

- The theory of Spiritual development was given by a James Fowler, development psychologist at Candler School of Theology.

SPIRITUAL DEVELOPMENT

Stage	Age group	Spiritual stage
I	Infancy	Primal faith
II	Early childhood- 3 to 7 years	Intuitive – Projective faith
III	Childhood and beyond- Beginning at about age 7 years	Mythic – Literal faith
IV	Adolescent period and beyond	Synthetic – Conventional faith

MORAL DEVELOPMENT

- The theory of Moral Development was developed by Jean Piaget and Lawrence Kohlberg.
- According to **Jean Piaget-** the moral development parallel mental development and consists of 2 stages:
  - **Respect for rules-** 3 to 11years- ***"morality of restraint."***
  - **Sense of justice –** from 12 years on- ***"morality of reciprocity or cooperation."***
- A the child develops, ideas of justice also change, the young child believes in "eye for an eye….tooth for a tooth."
- Later, because of continual interaction with the peer group, the older child and adolescent learn a concept of justice, becoming forgiving and taking extenuating circumstances into account before proclaiming a decision or verdict on an action.

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- **Lawrence Kohlberg** was an American psychologist; served as a professor in the Psychology Department at the University of Chicago and at the Graduate School of Education at Harvard University.

- Kohlberg postulates 6 stages of potential moral development, organized within 3 levels:

Levels	Stages		Age group
Level I- Pre-conventional morality: Egocentricity. Children make moral judgments only on the basis of what will bring them a reward (a right act)or a punishment (a wrong act).	Stage - 0	The good is what I like and want	Birth to 2 years
	Stage – 1	Punishment-obedience orientation	2 to 3 years
	Stage – 2	Instrumental hedonism and concrete reciprocity	4 to 7 years

Contd…

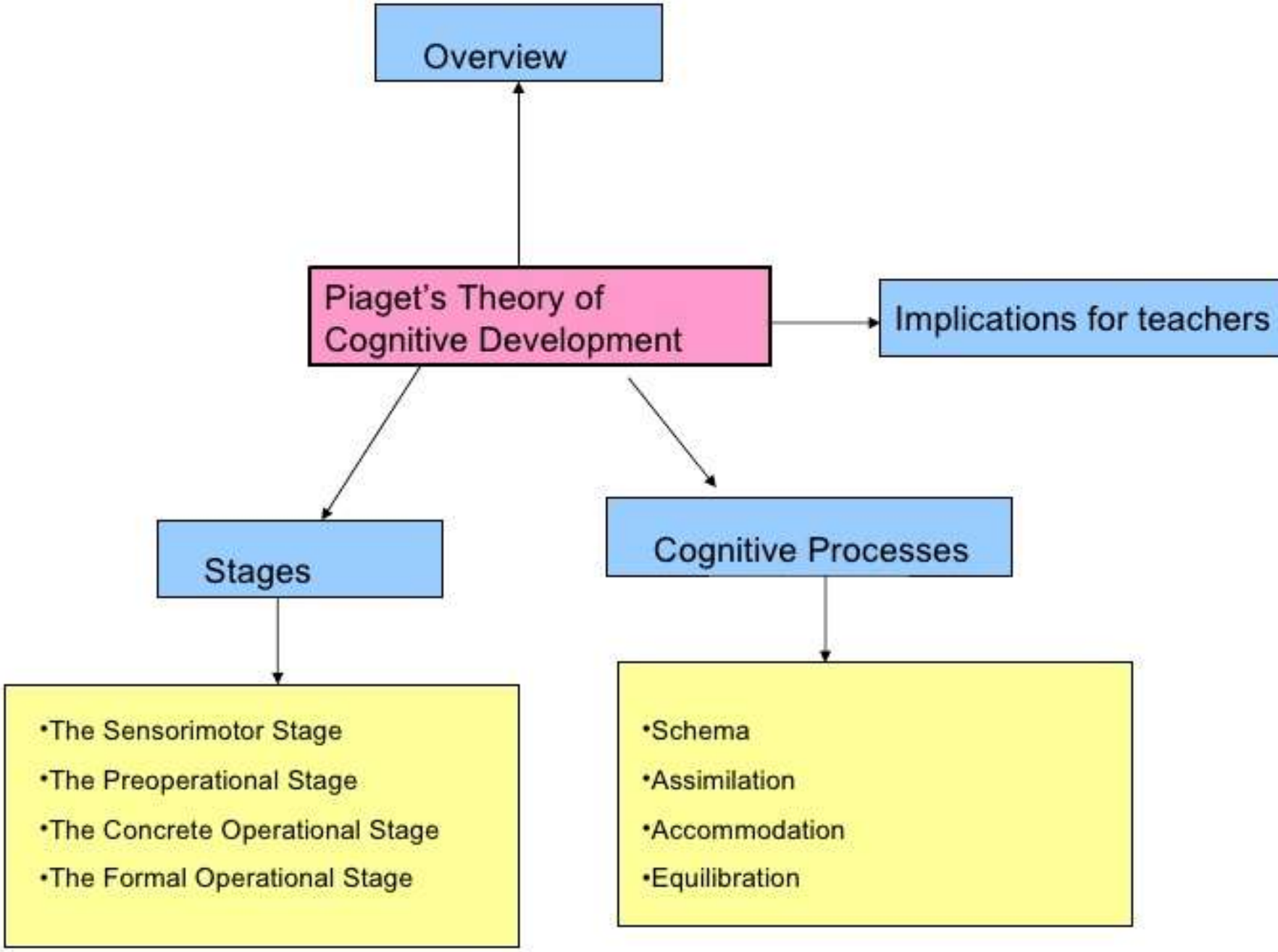
Levels	Stages		Age group
Level II- Conventional morality: Correct behavior is that which those in authority will approve and accept; if behavior is not acceptable, children feel guilty.	Stage - 3	Orientation to interpersonal relations of mutuality (Good boy- Nice girl orientation)	7 or 8 to 9 years
	Stage – 4	Maintenance of social order, fixed rules, and authority	10 to 12 years

Contd…

Levels	Stages		Age group
Level III- Post-conventional morality: Adolescents make choices on the basis of principles that have been thought about, accepted and internalized. Whatever actions conform to these principles are considered right in spite of the praise or blame of others.	Stage – 5A	Social contract, utilitarian law-making perspective	Adolescents and adulthood
	Stage – 5B	Higher law and conscience orientation	
	Stage – 6	Universal ethical principle orientation	

INTELLECTUAL DEVELOPMENT

- The Intellectual or Cognitive development was given **by Jean Piaget,** a Swiss developmental psychologist and philosopher known for his epistemological studies with children.


Overview
Piaget's Theory of Cognitive Development
Implications for teachers
Stages
Cognitive Processes
•The Sensorimotor Stage
•The Preoperational Stage
•The Concrete Operational Stage
•The Formal Operational Stage
•Schema
•Assimilation
•Accommodation
•Equilibration

- Piaget's theory describes 4 major cognitive processes:

1. **Schema:** is a category of thought or a classification for a behavior or action.
2. **Assimilation:** is the process during which the stimuli are recognized, absorbed, and incorporated into an already existing schema.
3. **Accommodation:** is the creation of new schema or the modification of the old one.
4. **Equilibration:** or the achievement of a balance between 2 elements, is the balance an individual attempts to maintain between assimilation and accommodation.

- Piaget stated 4 stages of Intellectual development.

Stage –I: Sensorimotor stage: (birth to 2 years)

- During this period, the infant's behavior progresses from biologic reflex activity through simple repetitive acts to imitative activity through the late infancy and early toddler period.
- 3 important events take place during this stage:

1. **Separating** of the infant's self from other persons, such as the mother, or objects in the environment,
2. Perceiving the concept of **object permanency or constancy**- that people and things continue to exist even though they cannot be seen, and
3. **Using symbols** to think of a situation or an object, such as a toy, without its being present in the immediate environment.

It has 6 sub-stages.

Substage-I (birth to 1 month):

- The biologic reflexes are the basis for the neonate's survival. On the basis of experience during the 1st month of life the infant manifests
- ***Functional assimilation-***or the repetition of reflexive actions such as sucking even when not hungry.
- ***Generalized assimilation-*** occurs when the infant no longer sucks only the breast or bottle, but also the non-nutritive items like a fist.
- ***Recognitory assimilation-*** occurs when the hungry infant will not accept a substitute for the breast or bottle.

Substage-II (1to 4 months): *Primary circular reaction*

- This sub stage marks the beginning of voluntary actions replacing reflexive behavior.

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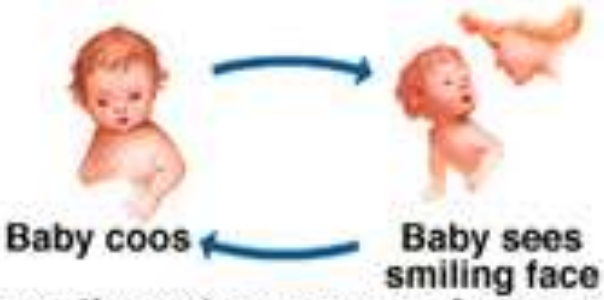
Primary, Secondary, And Tertiary Circular Reactions

(a)Primary circular reaction: action and response both involve infant's own body (1 to 4 months)



(b) Secondary circular reaction: action gets a response from another person or object, leading to baby's repeating original action (4 to 8 months)

(c) Tertiary circular reaction: action gets one pleasing result, leading baby to preform similiar actions to get similiar results (12 to 18 months)

Substage-III (4 to 8 months): *The secondary circular reaction.*

- This reaction involves events that are removed from the infant's body.
- Events that occur by accident in the environment are repeated by the infant if they produce interesting results.
- Further development occurs in establishing object permanence.

Substage-IV (8 to 12 months): *Coordination of secondary schemas.*

- The secondary reactions the infant learned earlier are combined and extended to deal with the new situations.
- Object constancy or the existence of objects even when they are out of sight progresses during this sub stage.

Contd…

Substage-V (12 to 18 months): *Tertiary circular reaction.*

- Instead of reproducing accidental events, the child chooses to vary them.

Substage-VI (18 months to 2 years): *The invention of new means through mental combinations.*

- The toddler shows evidence of the beginnings of mental representations of events. The child thinks about problems, no longer using only trail-and-error to solve them.

The toddler develops:

- ***Deferred imitation-***the child not only imitates what is seen in the present but can also imitate an event that occurred perhaps days before.
- ***Invisible displacement-*** implies not only the object permanence but also the presence of thought.

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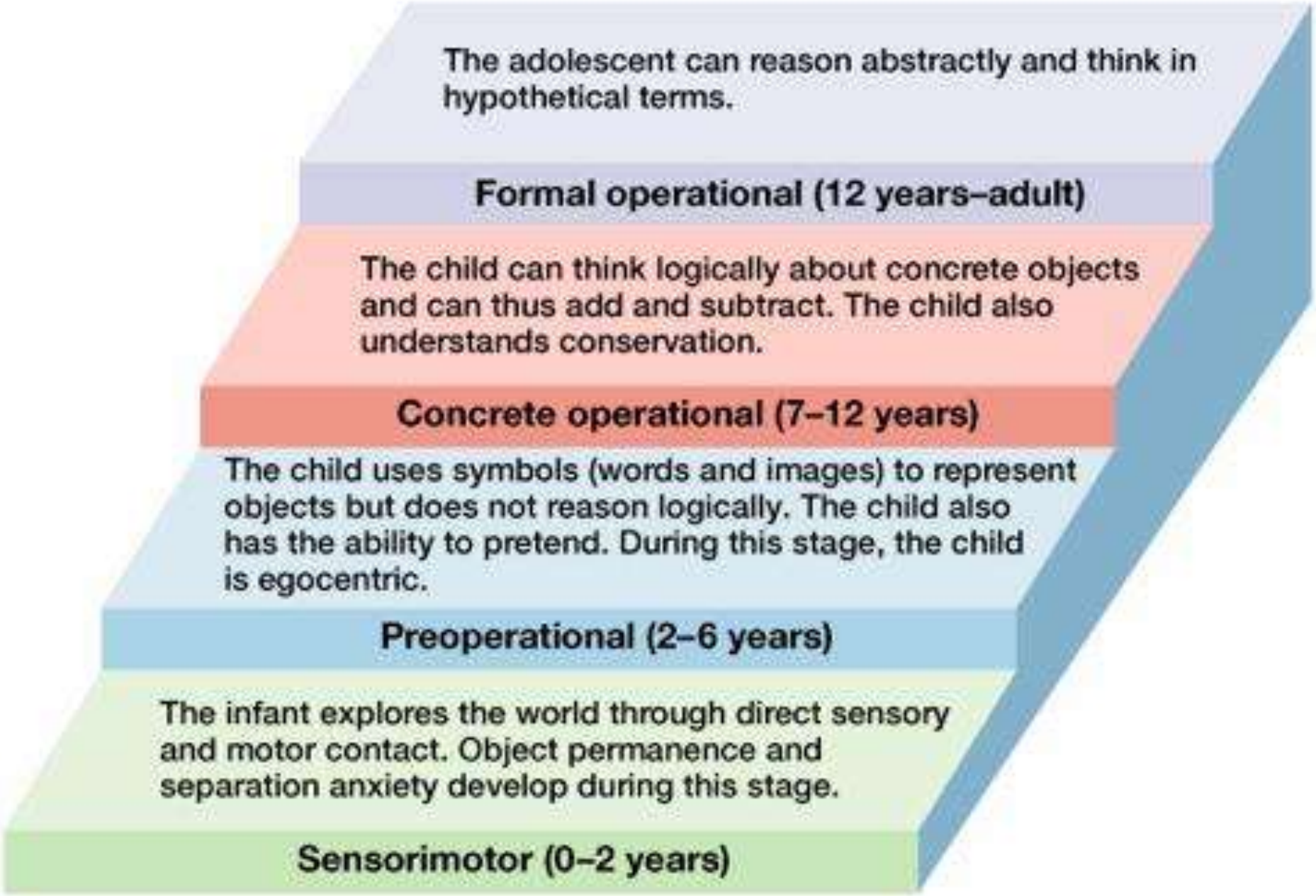

The adolescent can reason abstractly and think in hypothetical terms.
Formal operational (12 years–adult)
The child can think logically about concrete objects and can thus add and subtract. The child also understands conservation.
Concrete operational (7–12 years)
The child uses symbols (words and images) to represent objects but does not reason logically. The child also has the ability to pretend. During this stage, the child is egocentric.
Preoperational (2–6 years)
The infant explores the world through direct sensory and motor contact. Object permanence and separation anxiety develop during this stage.
Sensorimotor (0–2 years)

Stage –II: Pre- operational stage: (2 to 7 years)

- Functions symbolically using language as major tool.

Substage-I (2 to 4 years): *Pre conceptual phase*

- Uses representational thought to recall past, represent present, and anticipate future, transductive reasoning.

Eg: any woman who appears elderly with glasses and white hair by the term used for grandmother.

Contd…

Substage-II (4 to 7 years): *Intuitive phase*

Increased symbolic functioning, transductive reasoning.

- **Symbolism**
- **Reasoning and causality**
- **Concepts of the world**
  - Animism: Belief that stars and flowers not only have a life of their own but also have feelings and motives.
  - Realism: The child is conducted by the physical and psychologic realities of events and believes in the physical reality of psychologic events.

  Eg: upon wakening, the child tells parent "a horse stepped on me in my crib."
  - Artificialism: The young child believes that everything happens and all objects in the environment are there for the purpose of satisfying human needs.

  Eg: the chair is there because people want to sit down.

Contd…

Stage –III: Concrete operational stage: (7 to 11 years)

- Inductive reasoning and beginning logic ability to order and relate experiences to an organized whole.
- Ordering or Seriation: School age children are able to arrange things on concrete objects according to their size and relationships to other things.
- Classification: Children are increasingly able to classify objects in a more complex manner than they could during the preschool years.
- Thinking and reasoning: School children are no longer limited in their focus on aspects in their environment but are able to explore more facts of objects and situations.

Contd…

- Time: During the school age period children think not only at the present but also of the past and future.
- Children during the preschool period may have indicated their new understanding of time by saying "last week I went to the zoo" or next year I will go to school" but they rarely did not have a precise idea what was meant.
- Language and social behavior: Help in maintaining school relations with others.
- Preparation for school: Not all children are emotionally ready for school at the same chronologic age. The preschool child who has attended and adjusted were to nursery school or kinder garden probably will have difficulty with adjustment to school.
- School
- Role of the teacher
- Gifted children

Contd...

Stage –IV: Formal operational stage: (11 to 15 years)

Abstract and deductive reasoning; can plan and implement scientific approach to problem solving.

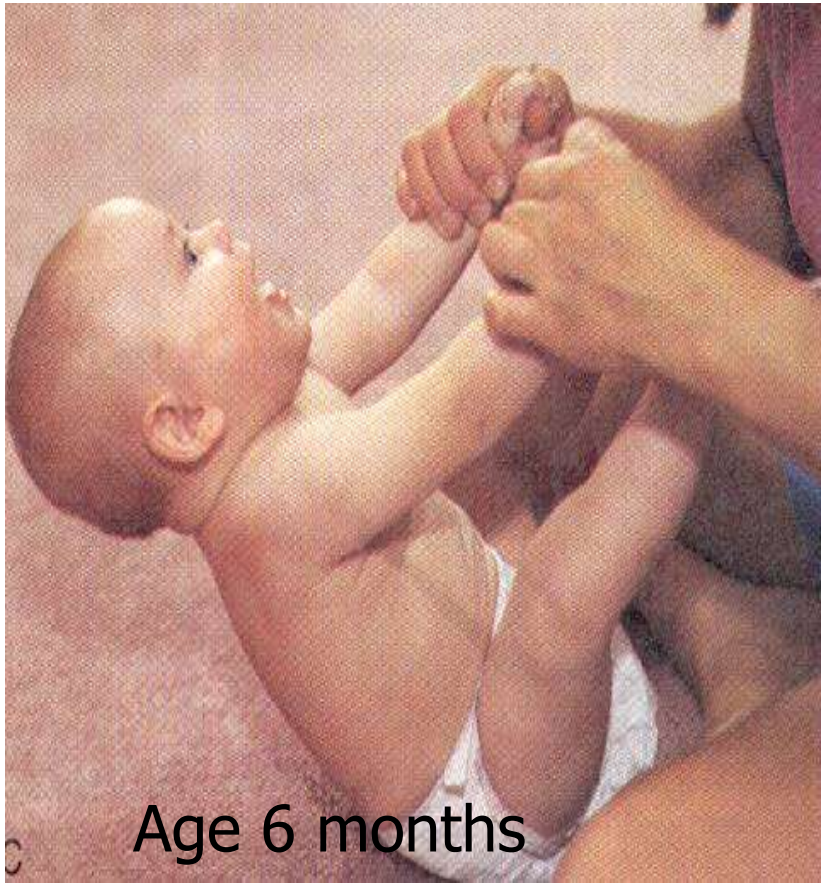
- Reaching this stage allows adolescent to deal with problems that does not have a basis.
- Unlike a younger child, adolescents can solve the following problem:
- "Tom is shorter than Joe; Tom is taller than Ted. Which boy is the tallest?"
- Adolescents utilize hypothetical deduction reasoning, they may question and perhaps argue the rules that other impose on them.
- Adolescents dream and plan into the future, but these dreams and plans may change as they think and learn, and their cognitive ability continues to develop.

❖ School

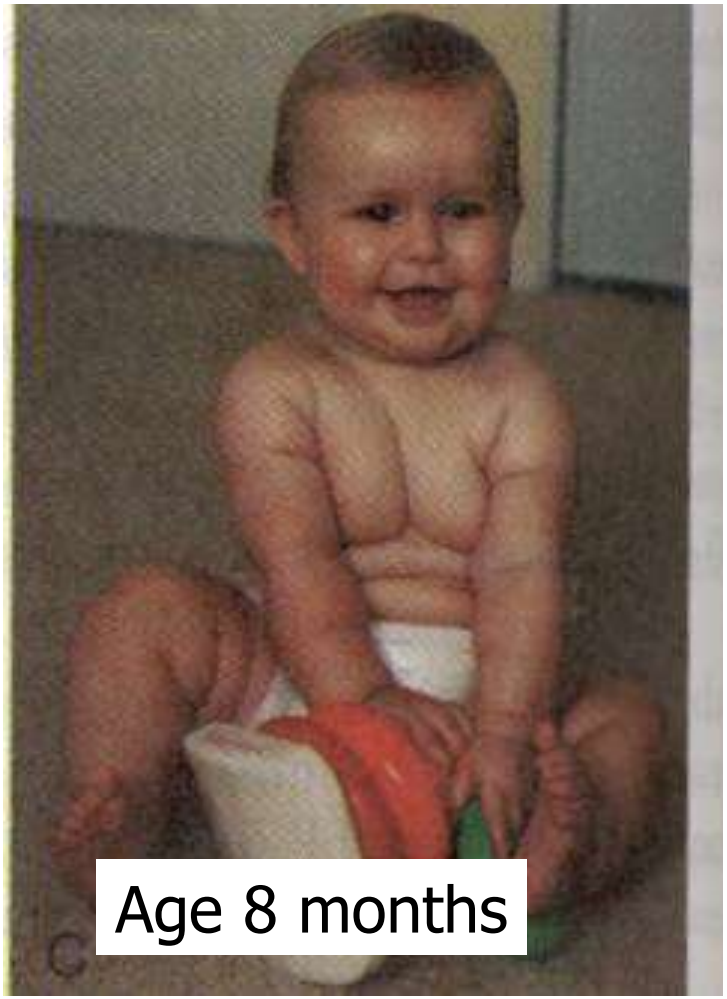
DEVELOPMENTAL MILESTONES

- 4 Months- Neck control
- 5 Months-Sitting with support, Rolls from back to front, Pulls feet upto mouth when supine
- 6 Months-Hitches, Pulls to a sitting position
- 7Months-Sits alne on hard surface, leaning forward on hands,Bounches actively when held in standing position
- 8 Months- Sitting without support,
- 9 Months-Standing with support, Crawling, creeping

Head Control



Sitting Up



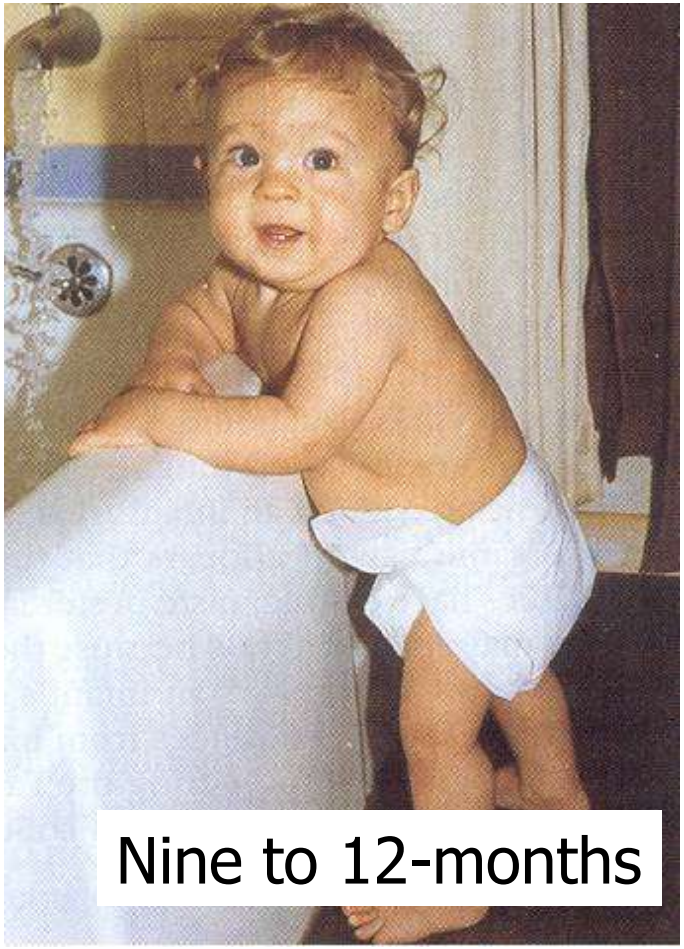
Toddler years (1 to 3) are a time of great growth and change, and a typical toddler will gain command of motor, cognitive and behavioral skills at a rapid rate

A.D.A.M.

Motor Development Milestones

- 10 Months –Walking with support
- 11 Months-Crawling (creeping) well
- 12 Months standing without support, Sits down from standing position alone, walks few steps with help or alone
- 13 -15Months – Walking without support, creeps upstairs .Wide based gait
- 18 Months-Running, walks sideways and backward, claims on furniture
- 24 Months-Walking upstairs
- 36 Months – Riding tricycle

Ambulation



Nine to 12-months

13 month old

PERSONAL & SOCIAL DEVELOPMENT

- 1 Months-Establishes eye contact, Quiets, cuddles when held, Perceived self & parents as one
- 2 Months-Social smile,
- 3Months-Recognise & smiles in response to caregivers face, stops crying when familiar person approaches
- 6Months-smiles at mirror image, Knows what is liked & disliked
- 7Months-Fear of stranger

- 9Months-Wavws bye-bye
- 10Months-Imitates others
- 12Months-Plays a small ball games
- 36Months-Knows gender

LANGUAGE DEVELOPMENT

- 1 Months-Attentive to speech of others, Turns head to sound
- 3Months-Cooing, Respond vocally to caregivers voice
- 4 Months-Laugh aloud, Vert talkative to self, people & toys
- 5 Months-Respond when own name is spoken
- Begins to mimic sounds

- 6 Months-Monosyllabus “ma ba”, Talk to image in mirror
- 7 6 Months-Monosyllabus “ma ba”, vocalizes mmmm when crying,
- 9 Months-Bisyllabus “mama baba dada”, Echolalia or correct imitative expression of sound made by others
- 11 Months-Jargon is well established
- 12 Months-Speaks 2 words with meaning, Imitates sounds animal makes
- 18 Months –Speaks 10 words with meaning
- 24 Months-Simple sentence, Knows about 300 words
- 36 Months-Telling a story,Knows 800-1000 vovambulary

FINE MOTOR DEVELOPMENT

- 1 Months-Hold hands in tight fist
- 4 Months-Grasp a rattle or rings when placed in hands
- 5Months-Reaches out to an object & hold it with both hands
- 7Months-Palmar grasp
- 8 Months-Drinks from cup wiyh assistance, Eats finger foods

Fine Motor Development

- 9Months-Pincer grasp
- 12Months-Enjoys rating with fingers, Turns pages in a books but usually not one at a time
- 15 Months-Opens boxes, Build a tower of 2-3 cubes, Makes line with crayons
- 18 Months-Scribbles vigorously, Build a tower of 3-4 cubes
- 30 Months-Build a tower of 8 cubes, Hold crayons with fingers

Toddler

Adele Piliterri, Child Health Nursing, Lippincott


A
B
C