

Growth and Development



- Autism
- Although often called infantile autism because it is thought to be present from birth, autism usually is not conclusively diagnosed until after 12 months of age.
- • The word autism comes from the Greek word auto meaning "self" and was first used by Dr. Leo Kanner in 1943 to describe a group of behavioral symptoms in children.
- • The term pervasive developmental disorder was introduced in 1980 when the American Psychiatric Association revised the terminology.
- • Disorders in this category are characterized by severe behavioral disturbance that affects the practical use of language as a means of communication, interpersonal interaction, attention, perception, and motor activity.
- • Autistic children are totally self-centered and unable to relate to others; they often exhibit bizarre behaviors and often are destructive to themselves and others.
- • Autism occurs in about 2 to 5 of 10,000 births and four times as often in males as in females. Several theories exist about its cause , as well as its treatment or management .

- • Originally thought to result from an unsatisfactory early mother-child relationship (with emotionally cold, detached mothers sometimes described as "refrigerator mothers"), autism now appears to have organic and perhaps genetic causes instead.
- • Although infants and toddlers normally are self - centered, ritualistic, and prone to displays of temper, autistic children show these characteristics to an extreme degree coupled with an almost total lack of response to other people.
- The autistic child is slow to develop speech, and any speech that develops is primitive and ineffective in its ability to communicate.
--Echolalia ("parrot speech") is typical of autistic children they echo words they have heard such as a television commercial , but offer no indication that they understand the words .

- • Standard intelligence tests that count on verbal ability usually indicate that these children test in the mentally retarded range of intelligence . However , many of these children also demonstrate unusual memory and mathematic , artistic , and musical abilities .
- Diagnosis
- • To confirm a diagnosis of autism , at least 8 of 16 identified characteristics must be present , and all three categories of characteristics must be represented .
- • The symptoms of autism can suggest other disorders , such as lead poisoning , phenylketonuria , congenital rubella , and measles encephalitis . a complete pediatric physical and neurologic examination is necessary , including vision and hearing testing , electroencephalography , radiographic studies of the skull , urine screening , and other laboratory studies .
- • In addition , a complete prenatal , natal , and postnatal history , including development , nutrition , and family dynamics , is taken .
- • Other members of the health team may be involved in the evaluation and treatment of the autistic child , including audiologists , psychiatrists , psychologists , special education teachers , speech and language therapists , and social workers .

- Treatment
- The treatment of an autistic child is extremely challenging .
- The child is mentally retarded but may demonstrate exceptional talent in areas such as factual memory and art or music .
-
- Treatment focuses on four goals :
 - .. Promotion of normal development
 - • Specific language development .
 - . Social interaction .
 - . Learning
- Behavioral modification , pharmacotherapeutics , and other techniques are used ,
 - • These treatments must be individually planned and highly structured .
 - • Mixed results occur , and no one technique has met with resounding success .
 - • The family needs therapy to help relieve guilt and help them understand this puzzling child . The overall long - term prognosis for these children is not optimistic ; however , the long - term outlook is better the earlier treatment is started
 - • Facilitated communication involves helping autistic children express themselves in language through use of a computer keyboard However , this method of promoting language development is controversial and is not totally supported by the American Psychological Association .

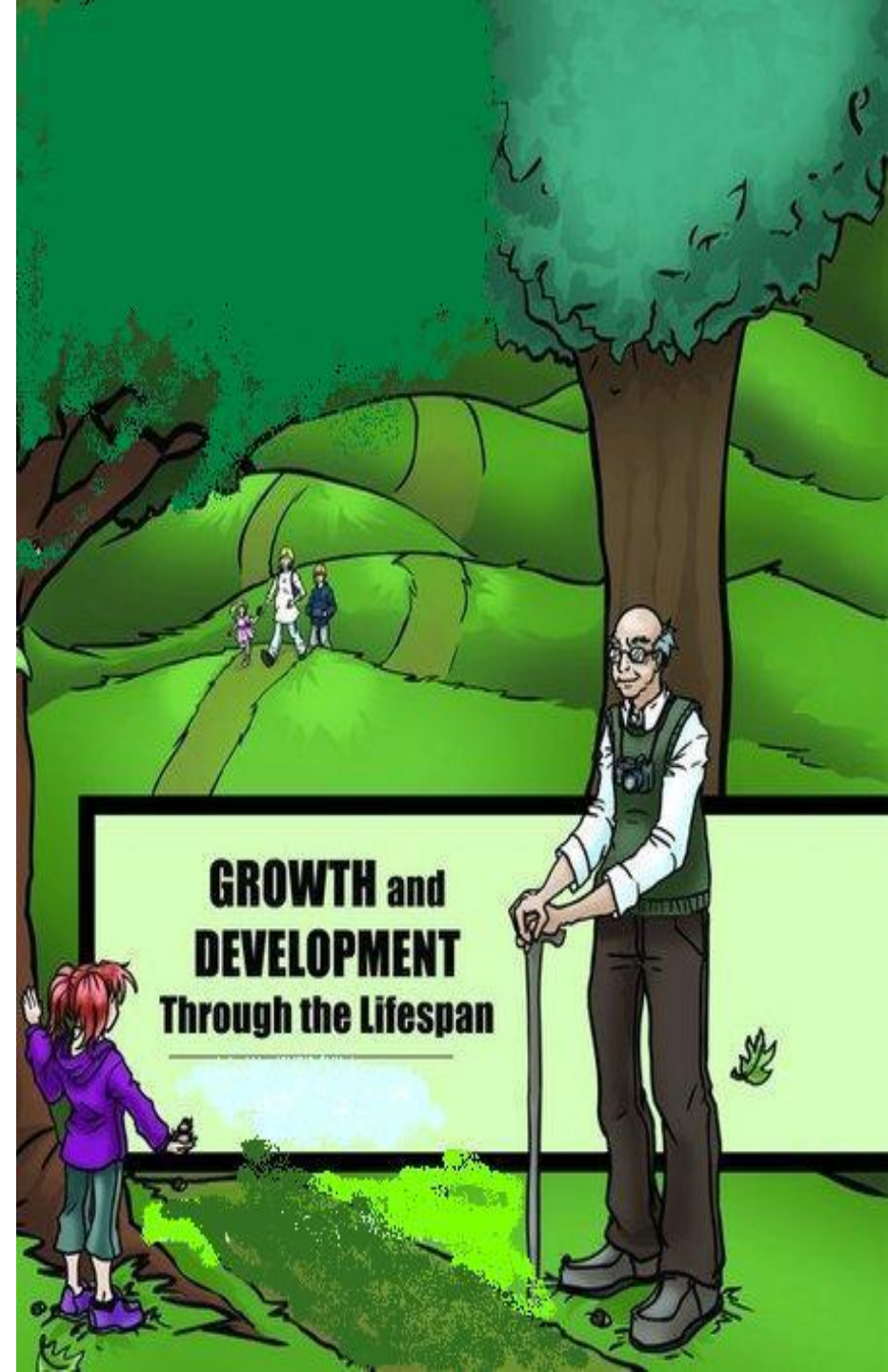
Growth

- It is the process of **physical maturation** resulting an increase in size of the body and various organs. It occurs by **multiplication** of **cells** and an increase in in intracellular substance. It is **quantitative** changes of the body.

Development

- Human development is the process of growing to maturity. From one zygote to an adult human being
- It is the process of functional and **physiological maturation** of the individual. It is progressive increase in **skill** and **capacity** to function. It is related to maturation and **myelination** of the **nervous system**. It includes psychological, emotional and social changes. It is **qualitative** aspects.

Principle of Growth and Development

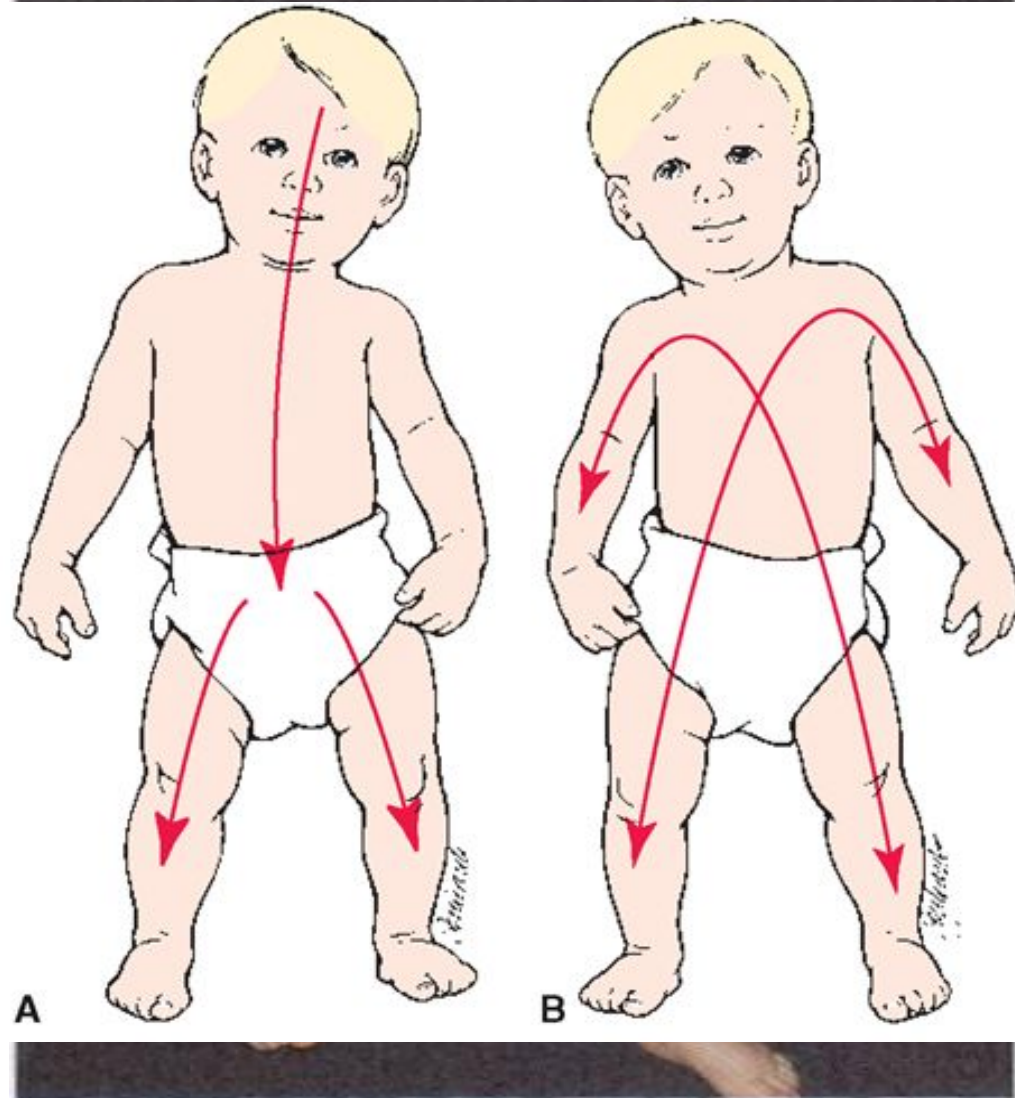


Directions

- Cephalocaudal direction
- Proximodistal direction
- General to Specific

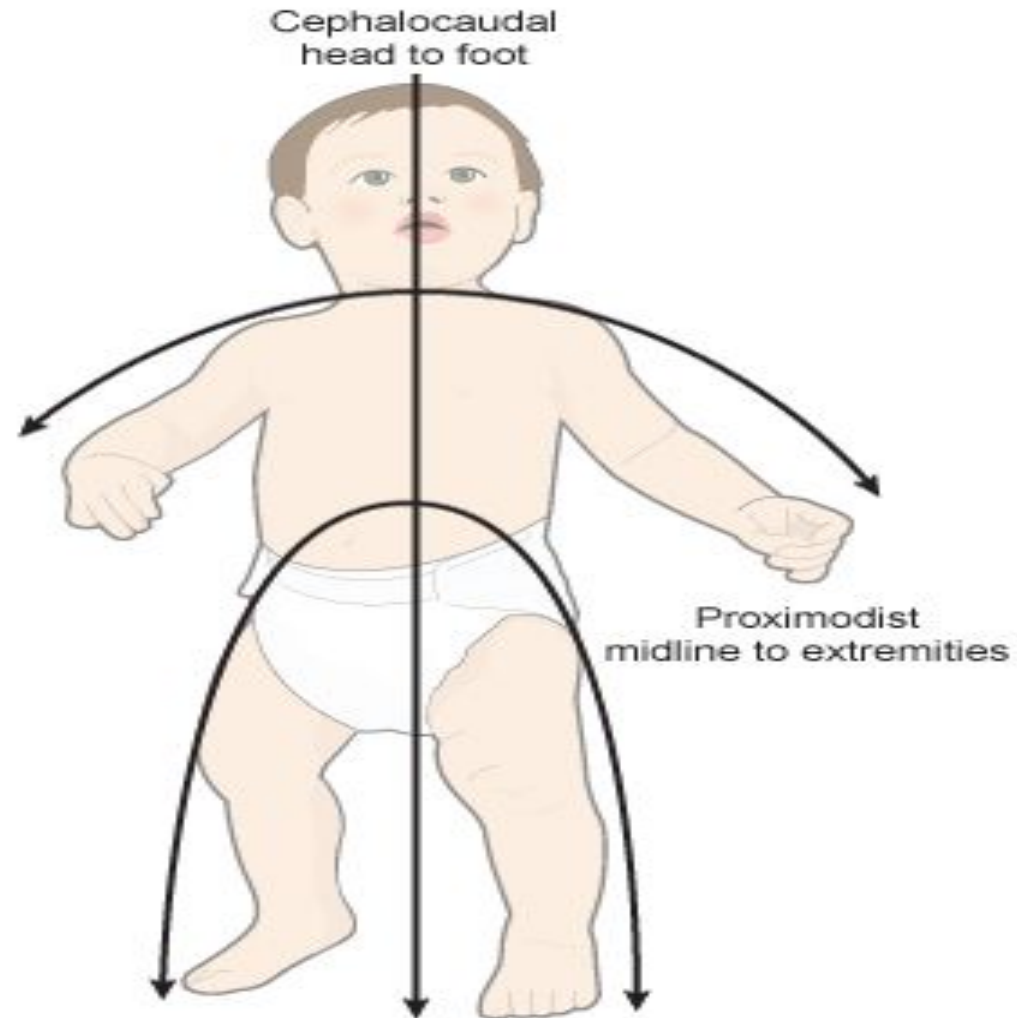
Cephalocaudal direction

- The process of **cephalocaudal** direction from **head** down to **tail**.
This means that improvement in structure and function come first in the head region, then in the trunk, and last in the leg region.



Proximodistal direction

The process in
proximodistal from
center or midline to
periphery direction.
development proceeds
from near to far -
outward from central
axis of the body
toward the extremities



General to Specific

- Children use their cognitive and language skills to reason and solve problems.
- Children at first are able hold the big things by using both arms, In the next part able to hold things in a single hand, then only able to pick small objects like peas, cereals etc.
- Children when able to hold pencil, first starts draw circles then squares then only letters after that the words.

- Development proceeds from general to specific responses



Factor influencing Growth and Development



- Growth and development depend upon multiple factors or determinates.
- They influence directly or indirectly by promoting or hindering the process.

- Genetic factors
- Prenatal factors
- Postnatal factors

Genetic factors

- Genetic predisposition is the importance factors which influence the growth and development of children.
- Sex
- Race and Nationality

Prenatal factors

- Intrauterine environment is an important predominant factor of growth and development. Various conditions influence the fetal growth in utero.

Cont...

- Maternal malnutrition
- Maternal infection
- Maternal substance abuse
- Maternal illness
- Hormones
- Miscellaneous

Postnatal factors

- Growth potential
- Nutrition
- Childhood illness
- Physical environment
- Psychological environment
- Cultural influence
- Socio economic status
- Climate and season
- Play and exercise
- Birth order of the child
- Intelligence
- Hormonal influence

GROWTH AND & DEVELOPMENTAL AGE PERIODS

- Stages in prenatal development (sperm fertilizes egg - birth)
 - Embryo (fertilization – 8 weeks after fertilization)
 - Zygote: single cell stage after fertilization
 - The germinal stage is over at about 10 days of gestation
 - Blastocyst: stage prior to implantation, when the embryo is a hollow sphere
 - Post-implantation embryo: period 1– 8 weeks after fertilization (3 to 10 weeks gestation)
 - • Fetus: (10th week of pregnancy - birth)

Infancy

- Neonate

- Birth to 1 month

- Infancy

- 1 month to 1 year

- Early Childhood
 - Toddler
 - 1-3 years
 - Preschool (play age)
 - 3-6 years

- Middle Childhood
 - School age
 - 6 to 12 years
- Late Childhood
 - Adolescent
 - 13 years to approximately 18 years

Growth and Development Monitoring

Assessment of growth

- Assessment of physical growth can be done by anthropometric measurement and the study of velocity of physical growth.
- Measurement of different growth parameters is the importance nursing responsibility in child care.

Weight

- weight is one of the best criteria for assessment of growth and a good indicator of health and nutritional status of child.
- Weight of the full terms neonate at birth is approximately **2.5 kg to 4kg**.
- there is about **10%** loss of weight first week of life, which regains by **10 days** of age.



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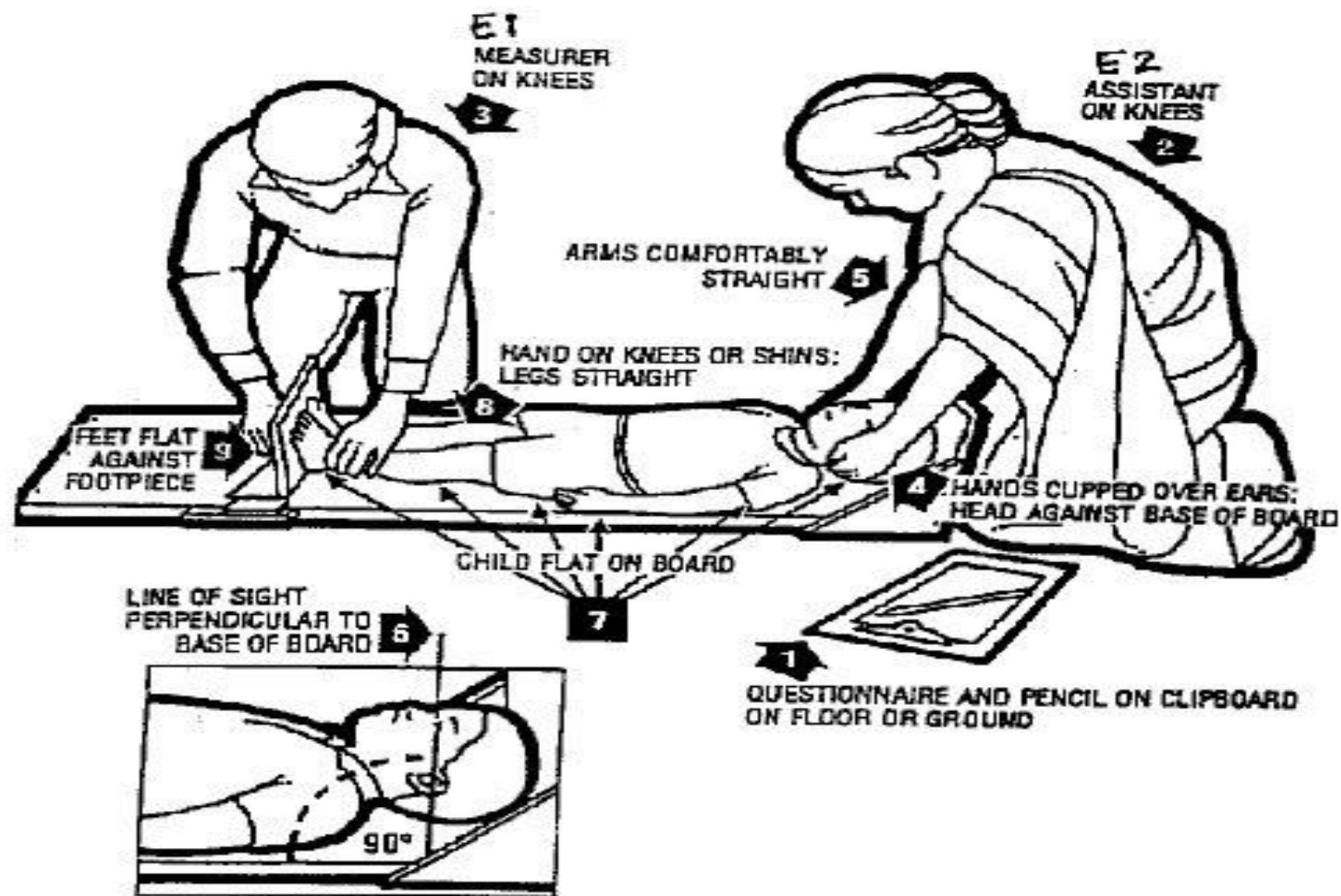
- Then, ^{Cont...} weight gain is about **25- 30 gm** per day for 1st **3 month** and **400gm/ month** till **one year** of age.
- The infants **double** weight gain their birth weight by **5month** of age, **trebled** by **one year**, **fourth** time by **two years**, **five** times by **three year**, **six** times by **five year**, **seven** times by **seven** year and **ten** times by **ten year**.
- Then weight increases rapidly during puberty followed by weight increase to adult size.

Length and height

- Increase in height indicates skeletal growth. Yearly increments in height gradually diminished from birth to maturity.
- At birth average length of a healthy newborn baby is **50 cm**.
- it increases to **60 cm** at **3 months**, **70 cm** of **9 month** and **75 cm** at **one year** of age.

Cont...

- In **second year**, there is 12 cm increase, **third year** it is **9 cm**, **fourth year** it is **7 cm** and in **fifth year** it is **6 cm**.
- so the child **double** the birth by **4 to 4.5 years** of age afterwards there is about **5 cm increase** in every year till onset of puberty.





Body Mass index (BMI)

- It is an important criteria which helps to assess the normal growth or its deviations i.e. malnutrition or obesity.

Weight in Kg

$$\text{BMI} = \frac{\text{Weight in Kg}}{(\text{Height in meter})^2}$$

- BMI remains content up to the age of 5 years. If the BMI is more than **30 kg/m²**, it indicates **obesity** and if it is less than **15Kg/m²**, it indicates **malnutrition**.

BMI Categories:-

- Underweight = <18.5
- Normal weight = $18.5-24.9$
- Overweight = $25-29.9$
- Obesity = BMI of 30 or greater

Head circumference

- It is related to brain growth and development of intracranial volume.

Average head circumference measured about **35 cm** at birth.

- At **3 months** it is about **40 cm**, at **6 month 43 cm**, at **one year 45cm**, at **2 years 48 cm**, at **7 year 50 cm** and at **12 years** of age it is about **52 cm**, almost same a adult.

- If head circumference increase more than **1 cm** in **two weeks** during the **first 3 month** of age then **hydrocephalus** should be suspected.
- Head circumference is measured by **ordinal tap**, placing it over the **occipital protuberance** at the back, above the ear on the side and just over the supraorbital ridges in front measuring the point of height circumference.



Fontanelle Closure

- At birth, anterior and posterior fontanelle are usually present. **Posterior fontanelle** closes early few weeks(**6-8week**) of age.
- The **anterior fontanelle** normally closes by **12-18 months** of age. Early closure of fontanelle indicates **craniosostenosis** due to premature closure of skull sutures.



Chest circumference

- chest circumference or thoracic diameters is an importance parameter of assessment of growth and nutrition status.
- At birth it is 2-3cm less than head circumference. At 6 to 12 months of age both become equal.
- After first year of age, chest circumference is greater than head circumference by 2.5 cm and by the age of 5 year, it is about 5 cm larger than head circumference.

Cont...

- Chest circumference is measured by placing the tape measure around the chest at level by placing the tape measure around the chest at the level of the nipple, in between inspiration and expiration.



Mid Upper Arm Circumference(MUAC)

- This measurement helps to assess the nutritional status of younger children.
- There is growth due to inadequate nutritional, which can be this simple, practical and useful measurement.



- The average MUAC at **birth** is **11 to 12 cm**, at **one** year of age it is **12 to 16 cm**, at **1 to 5** years it is **16 to 17** cm, at **12 years** it is **17 to 18 cm** and at **15 years** it is **20 to 21cm**.

Eruption of teeth

- There is a variation for the time of eruption of teeth. First teeth commonly the lower **central incision** may appear in **6 to 7 months** of age.
- It can be delayed even up to **15 months**, which also can be considered within the normal range of time for teething.
- So dentition is not dependable parameters for assessment of growth.
- There are 'two sets of teeth, temporary teeth bigger in size for two sets of teeth.

Age	Type	Total number of teeth
	Temporary teething	
6 – 12 months	Incisors(central and lateral)	2-8
12 – 15 months	First molar	8- 12
15 – 24 months	Canines(cuspids)	12 – 16
24 – 30 months	Secondary molar	16 - 20
	Permanent teething	
6 -7 years	First permanent molars	24
7 10 years	Replacement of temporary	
10 -12 years	Replacement of temporary molar by premolars	
12 – 15 years	Secondary permanent molars	28
16 years	Third permanent molars	32

Osseous growth

- Bony growth follows a definite pattern and time schedule from birth to maturation.
- It is calculated by the appearance of ossification center by **X – ray** study.
- Skeletal maturation or bone growth is an indicator of physiological development and continue up to 25 years of age.

Growth monitoring

- Assessment of growth may be done by longitudinal & cross sectional studies. The common parameters used for growth monitoring include, head circumference, chest circumference, UL/LS ratio. The following are the 3 members used for comparisons:-

Cont...

- Use of mean/median values.
- Use of percentile
- Use of indices as weight for height & weight for age.
- Common reference values-
 - WHO reference value

Assessment of Development

- Normal development is a complex process & has a multitude of facets. However, it is convenient to understand & assess development under the following domains.

- Gross motor development**
- Fine motor skill development**
- Personal & social development**
- Language**
- Vision & hearing.**

Gross motor development

- Motor development progress in an orderly sequence to ultimate attainment of locomotion & more complex motor tasks thereafter. In an infant it is assessed & observed as follows:-

Cont...

Key gross motor development milestones

Age	Milestone
3m	Neck holding
5m	Rolls over
6m	Sits with own support
8m	Sitting without support
9m	Standing holding on (with support)
12m	Creep well, stand without support
15m	Walks alone creeps upstairs
18m	Runs
2 yr	Walks up and down stairs
3 yr	Rides tricycle,
4yr	Hops on one foot, alternate feet going downstairs.

Fine motor skill development

- Fine motor development upon neural tract maturation. Fine motor development promotes adaptive activities with fine sensorimotor adjustments and include **eye coordination, hand eye coordination, hand to mouth coordination, hand skill as finger thumb apposition, grasping, dressing** ect.

Key fine motor development milestone

Age	Milestone
4m	reaching out for the objects with both hands
6m	Reaching out for the objects with one hand
9m	Immature pincer graps
12m	Pincer graps mature
15m	Imitates scribbling, tower of 2 blocks
18m	Scribbles, tower of 3 blocks
2yr	Tower of 6 blocks, vertical and circular stroke
3 yr	Tower of 9 blocks, copies circle
4yr	Copies cross, bridge with blocks
5yr	Copies triangle, gate with blocks

Personal & social development

- Personal and social development includes personal reactions to his own social and cultural situations with neuromotor maturity and environment stimulation. It is related to interpersonal and social skill as social smile, recognition of mother, use of toys.

Key social and adaptive milestones

Age	Milestone
2m	Social smile
3m	Recognizes mother
6m	Recognizes strangers, stranger anxiety
9m	Waves “bye bye”
12m	Comes when called, plays simple ball game
15m	Jargon
18m	Copies parents in tasks
2yr	Asks for food, drink, toilet
3yr	Shares toys, knows full name and gender
4yr	Plays cooperatively in a group, goes to toilet alone.
5yr	Helps in household tasks, dressing and undressing

Language development

Age	Milestone
1m	Alerts to sound
3m	Coos (musical vowel sounds)
4m	Laugh loud
6m	Monosyllables (ba, da, pa) sound
9m	Bisyllables (mama, baba, dada) sound
12m	1-2 words with meaning
18 m	8 -10 words vocabulary
2yr	2-3 word sentences, uses pronouns “I”, “Me”, “you”
3 yr	Ask question
4yr	Says songs or poem, tell stories
5yr	Asks meaning of words

Assessment of Development

- *Healthy development, in all forms, particularly social/emotional, communication, and behavior, should be monitored by parents and physicians through screenings at each well visit.*

Cont...

- **The Denver Developmental screening test**
- **Denver articulation screening examination (DASE)**
- **Baroda screening test**
- **Trivandrum development screening test**
- **Other test**
 - **Woodside DST**
 - **Cognitive adaptive test**
 - **Early language milestone etc.**

The Denver Developmental screening test

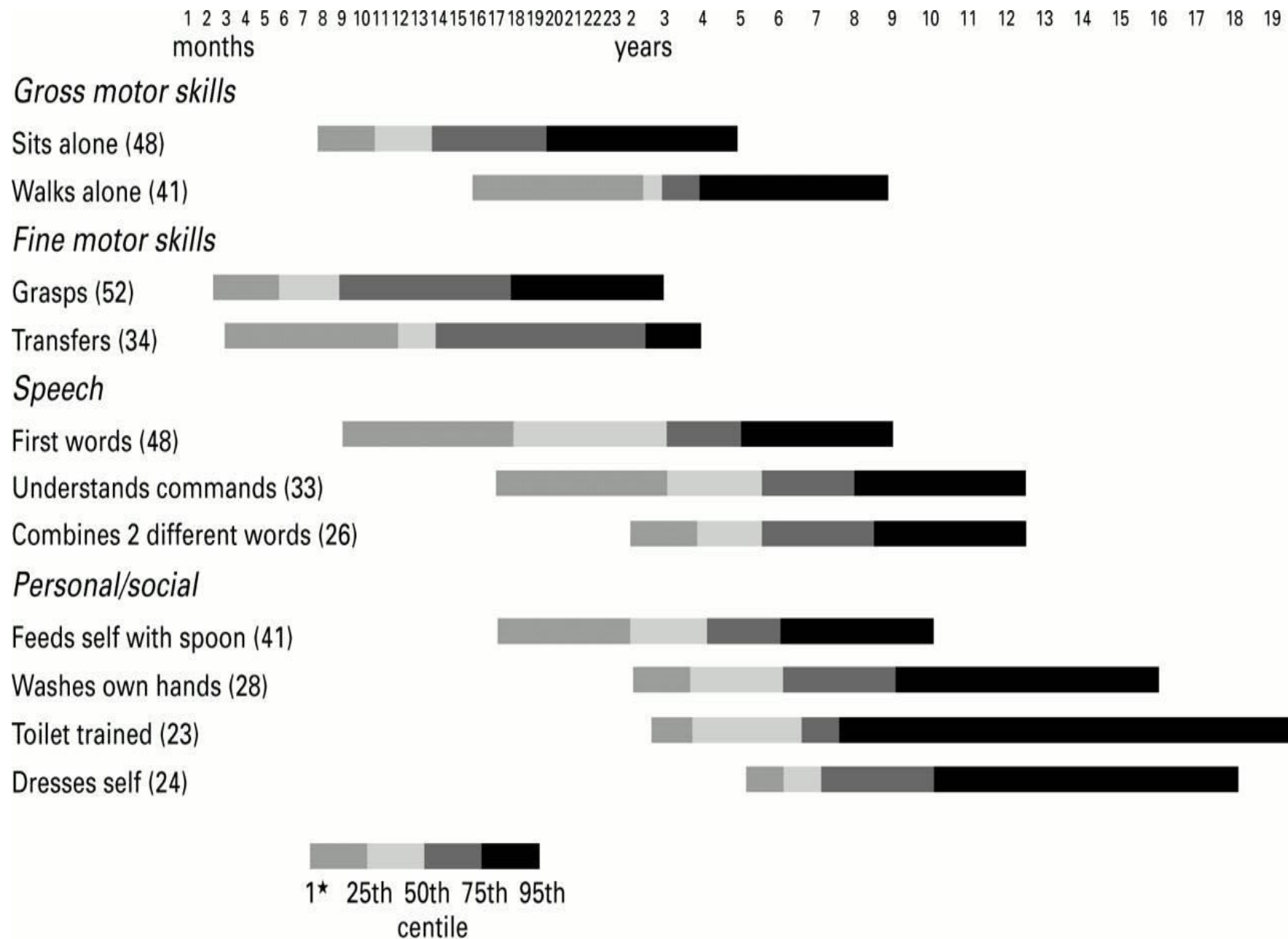
- Developmental originally by **Franken – burg** and **dodds(1967)**, this simple, economic and useful test screens for developmental delays during infancy and the preschool period.
- On the test, the age division are monthly unit 2 years of age , and half yearly from 2 to 6 years of age.

Baroda Screening test

- It was developed by **Dr. Promila phatak** with **25 test items** primarily for psychological aspects. The test is relevant for age **0 to 30 months**. **Gross motor, fine motor and cognitive aspects** are evaluated in **10 mints** mainly by the psychologist

Trivandrum development screening test

- It is simplified version of **Baroda DST** that can be used by the health worker, nurses and pediatricians/physicians. It has **17** test items relevant for **0 to 2 years** of age. The children are evaluated in three domains(gross motor, fine motor and cognitive for **5 minutes** only.



(1* = first reported age of completion)

DIFFERENCE BETWEEN GROWTH AND DEVELOPMENT

GROWTH	DEVELOPMENT
▶ The term is used in purely physical sense. It generally refers to increase in size, length. ▶ Changes in the quantitative aspects come into the domain of Growth.	❖ Development implies overall change in shape, form or structure resulting in improved working or functioning. ❖ Changes in the quality or character rather than the quantitative aspects comes in this domain.

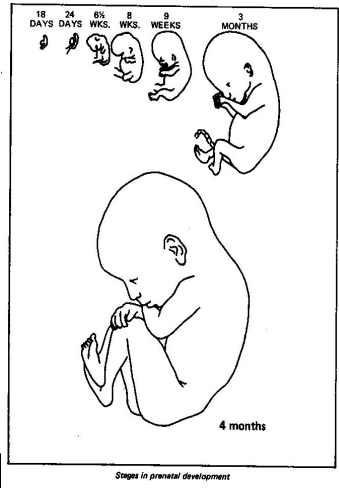
GROWTH	DEVELOPMENT
▶ It is a part of developmental process. Development in its quantitative aspect is termed as growth. ▶ Growth does not continue throughout life. It stops when maturity has been attained.	❖ It is a comprehensive and wider term and refers to overall changes in the individual. ❖ Development is a wider and comprehensive term and refers to overall changes in the individual. It continues throughout life and is progressive.

GROWTH	DEVELOPMENT
▶ Growth involves body changes. ▶ The changes produced by growth are the subject of measurement. They may be quantified.	❖ Development involves changes of an orderly, coherent type tending towards the goal of maturity. ❖ Development implies improvement in functioning and behavior and hence bring qualitative changes which are difficult to be measured directly.

GROWTH	DEVELOPMENT
➤ Growth is cellular . It takes place due to the multiplication of cells. ➤ Growth may or may not bring development.	❖ Development is organizational. It is organization of all the parts which growth and differentiation have produced. ❖ Development is also possible without growth.

- Development depends on the maturation and myelination of nervous system.
- The sequence of the development is the same for all children, but the rate of development varies from child to child
- Certain primitive reflexes anticipate corresponding voluntary movement and have to be lost before the voluntary movement develops

- Development follows a direction pattern
- Development is cumulative
- Development is a result of interaction of Maturation and Learning



- Development is a product of contribution of Heredity and Environment

SOMATIC GROWTH

- SKELETAL GROWTH
- BONE AGE ESTIMATION
- ERUPTION OF TEETHS

ERRUPTION OF TEETH



CLASSIC STAGE THEORIES

PSYCHOLOGY CAN BE DEFINED AS THE STUDY OF MENTAL PROCESSES AND BEHAVIOR.

SOME OF THE MAJOR PERSPECTIVES IN PSYCHOLOGY INCLUDE THE:

BIOLOGICAL PERSPECTIVE

COGNITIVE PERSPECTIVE

BEHAVIORAL PERSPECTIVE

EVOLUTIONARY PERSPECTIVE

HUMANISTIC PERSPECTIVE

- Theories of Personality Development
- Behavioral theories
- Developmental theories
- Psychosocial theories

FREUD'S PSYCHO SEXUAL THEORY

INFANCY	ORAL
TODDLERHOOD	ANAL
PRE SCHOOL	PHALLIC
SCHOOL AGE	LATENCY
ADOLESCENCE	GENITAL

PSYCHO SOCIAL THEORY Erik Erikson's theory

INFANCY	BASIC TRUST VS MISTRUST
TODDLERHOOD	AUTONOMY VS SHAME AND DOUBT
PRE SCHOOL	INITIATIVE VS GUILT
SCHOOL AGE	INDUSTRY VS INFERIORITY
ADOLESCENCE	IDENTITY VS ROLE DIFFUSION

TRUST VS MISTRUST

is the first stage of Erik Erikson's theory of psychosocial development. This stage occurs between birth and approximately 18 months of age. According to Erikson, the trust versus mistrust stage is the most important period in a person's life.

A Quick Overview of the Trust vs. Mistrust Stage

- **Psychosocial Conflict:** Trust vs. Mistrust
- **Major Question:** "Can I trust the people around me?"
- **Basic Virtue:** Hope
- **Important Event(s):** Feeding

AUTONOMY VS SHAME AND DOUBT

Toddler

child at this stage are focused on developing a greater sense of self-control.

Psychosocial Conflict: Autonomy versus Shame and Doubt
Major Question: "Can I do things myself or am I reliant on the help of others?"

Basic Virtue: Will

Important Event(s): Toilet Training

INITIATIVE VS GUILT

- PRE SCHOOLERS
- **Psychosocial Conflict:** Initiative versus Guilt
- **Major Question:** “Am I good or bad?”
- **Basic Virtue:** Purpose
- **Important Event(s):** Exploration, Play

INDUSTRY VS INFERIORITY

The stage occurs during childhood between the ages of approximately six and eleven.

- **Psychosocial Conflict:** Industry versus Inferiority
- **Major Question:** "How can I be good?"
- **Basic Virtue:** Competence
- **Important Event(s):** School

IDENTITY VS ROLE CONFUSION

- ADOLESCENTS
- This stage occurs during adolescence between the ages of approximately 12 and 18. During this stage, adolescents explore their independence and develop a sense of self.
- **Psychosocial Conflict:** Identity Versus Confusion
- **Major Question:** "Who am I?"
- **Basic Virtue:** Fidelity
- **Important Event(s):** Social Relationships

INTIMACY VS ISOLATION

- This stage takes place during young adulthood between the ages of approximately 19 and 40.
- During this period, the major conflict centers on forming intimate, loving relationships with other people.
- **Psychosocial Conflict:** Intimacy Versus Isolation
- **Major Question:** "Will I be loved or will I be alone?"
- **Basic Virtue:** Love
- **Important Event(s):** Romantic Relationships

GENERATIVITY VS STAGNATION 40-65yr

Generativity refers to making your mark

Stagnation refers to the failure to find a way to contribute.

- A quick summary of this stage:
- **Psychosocial Conflict:** Generativity Versus Stagnation
- **Major Question:** "How can I contribute to the world?"
- **Basic Virtue:** Care
- **Important Event(s):** Parenthood and Work

PIAGET: 4 STAGES OF DEVELOPMENT

- Jean Piaget's theory of cognitive development suggests that children move through four different stages of mental development.
- **Sensorimotor (0-2 years)** knows the world through their movements and sensations, sucking, grasping)
- **Preoperations (2-7 years)** emergence of language)
- **Concrete Operations (7-12 years)** thinking logically about concrete events)
- **Formal Operations (12- up)** think abstractly and reason about hypothetical problems, g to s)

- Maturation:

Process wherein development in the individual is due to bodily changes determined by heredity.

- Nature:

Refers to a person's inherited characteristics, determined by genetics.

- Nurture:

Refers to a person's experiences in the environment.

- Heredity :

Refers to the sum total of characteristics biologically transmitted through parents to offspring and direct determining physical constitution and traits.

- Two Types of Cells of Human Being

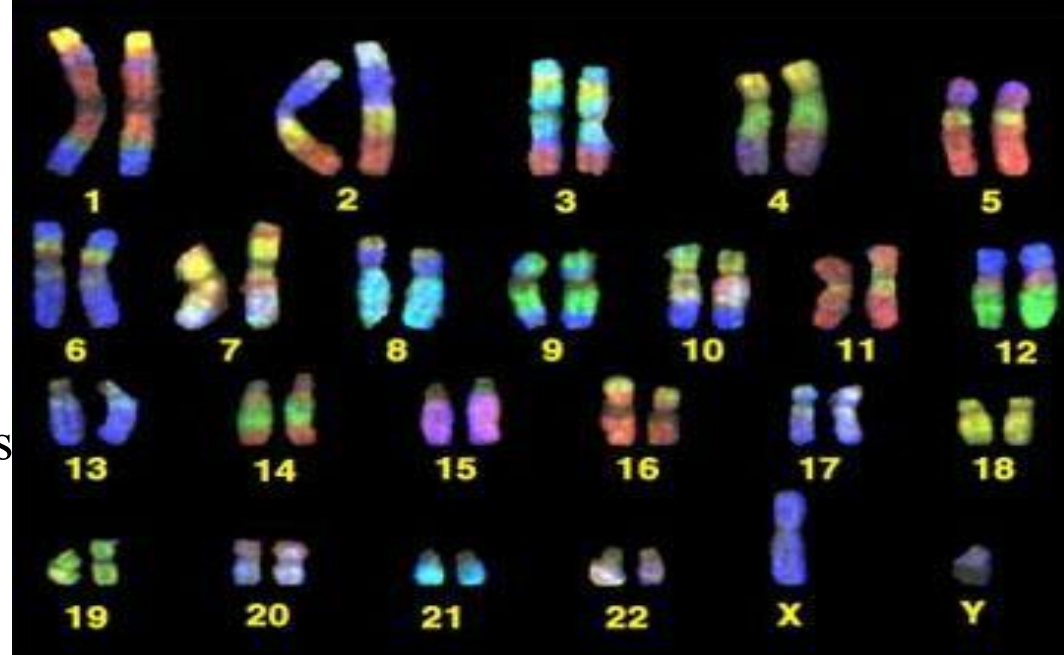
- * Body or Somatic Cells
 - * Germ or Reproductive Cells

- Heredity is concerned with germ cells.

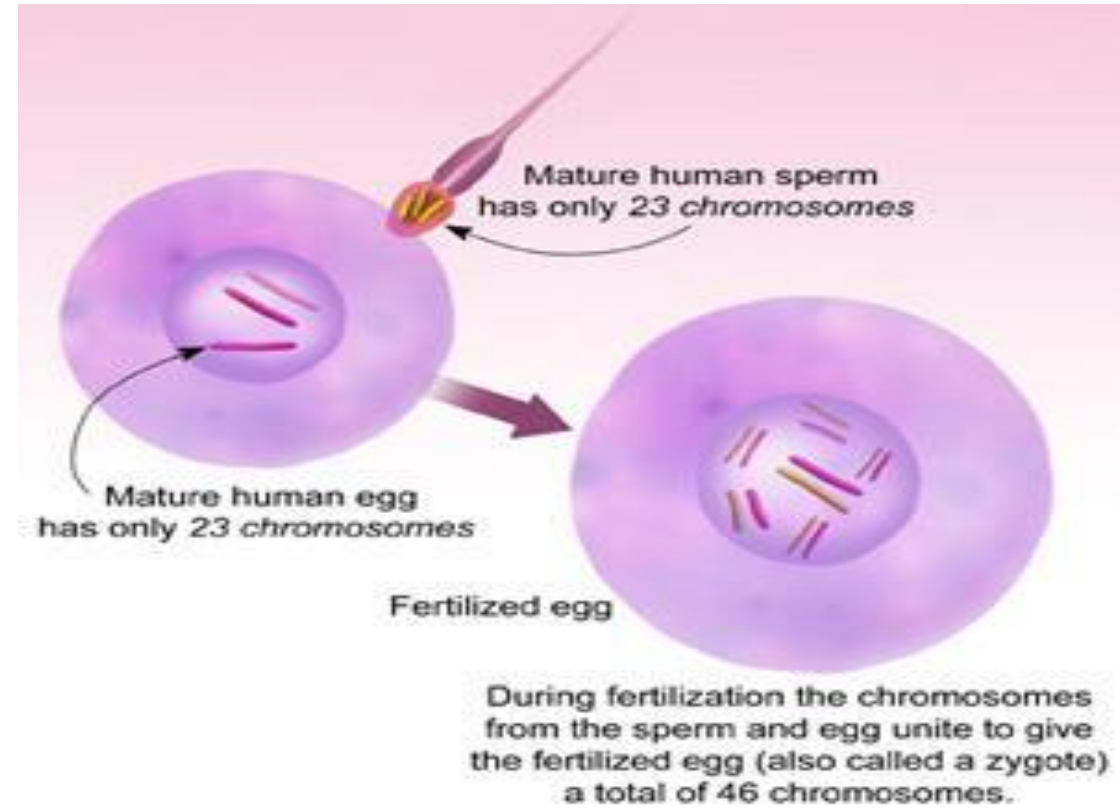
- Each of these cells has a nucleus which contains set of 46 chromosomes arranged in 23 pairs.

- Chromosomes: physical vehicles that contain the estimated quarter of a million genes.

- Genes: large molecules of deoxyribunucleic acid (DNA) that Are the actual hereditary units that combine and act to determine the individuals unique physical structure.



HUMAN INHERITANCE



- The 46 chromosomes contain the individual's genotype, the full set of genes inherited from both parents. How the individual actually looks and acts is his or her phenotype.
- Defective genes produce defective characteristics and normal genes, normal characteristics under the average normal environmental conditions.

General Rule:

- The normal gene is dominant and the defective gene, recessive.

DEVELOPMENTAL AND PROBLEMS

CHROMOSOMAL ABNORMALITIES

Down syndrome

- Most common chromosomal birth defect which is often referred to as mongolism as trisomy 21.
- Usually caused by the presence of an extra chromosome.
- It is typically associated with physical growth delays, characteristic facial features and mild to moderate intellectual disability and skeletal deformities and abnormally—wide set eyes.
- The average IQ of a young adult with Down syndrome is 50, equivalent to the mental ability of an 8- or 9-year-old child, but this can vary widely.



Turner's Syndrome or Sexual Infantilism

- This results in females having a single X chromosome, instead of the normal XX.
- The most common feature of Turner syndrome is short stature
- This disorder usually involves failure to develop sexual characteristics; the individual that has the female genitalia but lacks ovaries, hence, cannot become pregnant.
- Although usually of normal intelligence, the individual shows specific cognitive defects which is called VISUAL AGNOSIA - inability to discriminate or recognize the form of objects
- Developmental delays, nonverbal learning disabilities, and behavioral problems are possible, although these characteristics vary among affected individuals.

Short stature

Low hairline

Shield-shaped
thorax

Widely spaced
nipples

Shortened
metacarpal IV

Small
finger nails

Brown spots (nevi)

Characteristic
facial features

Fold of skin

Constriction
of aorta

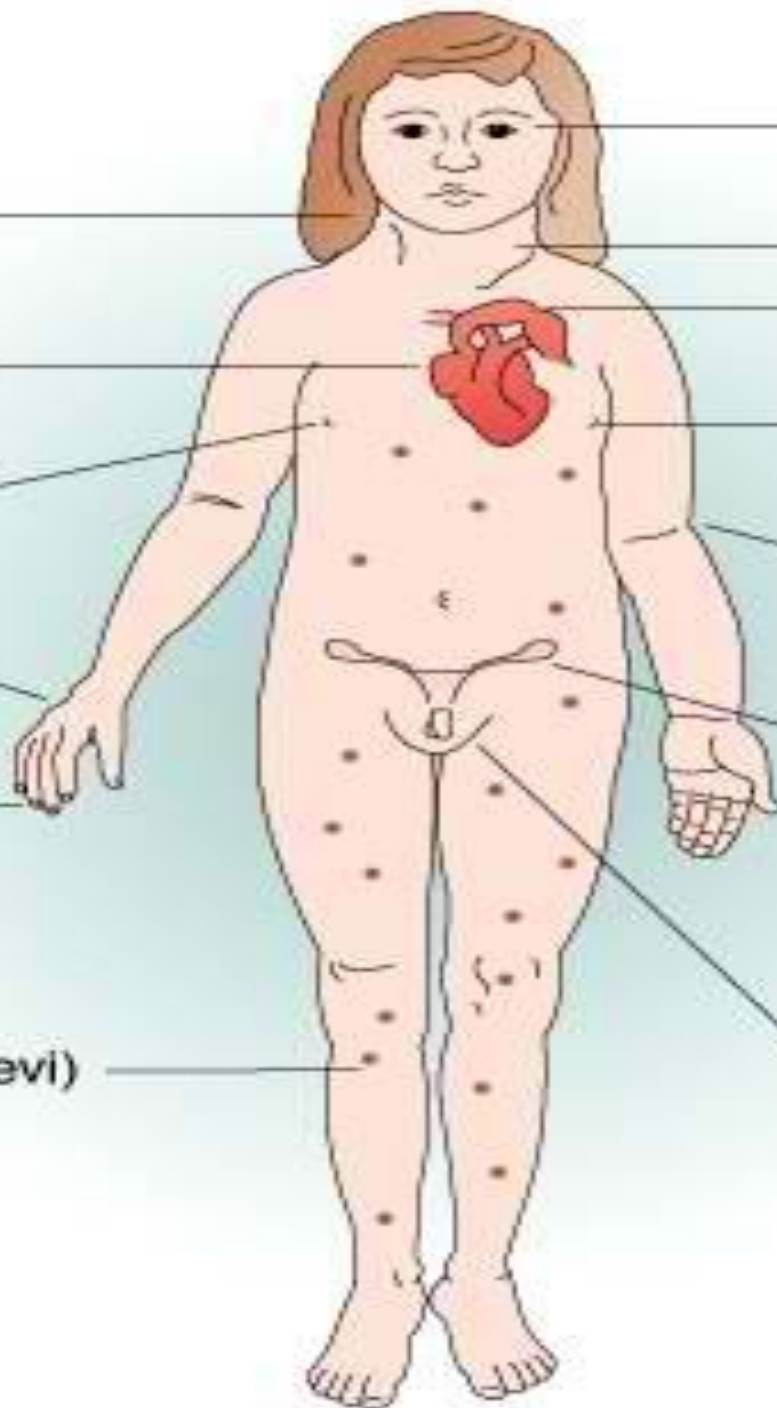
Poor breast
development

Elbow
deformity

Rudimentary
ovaries

Gonadal streak
(underdeveloped
gonadal
structures)

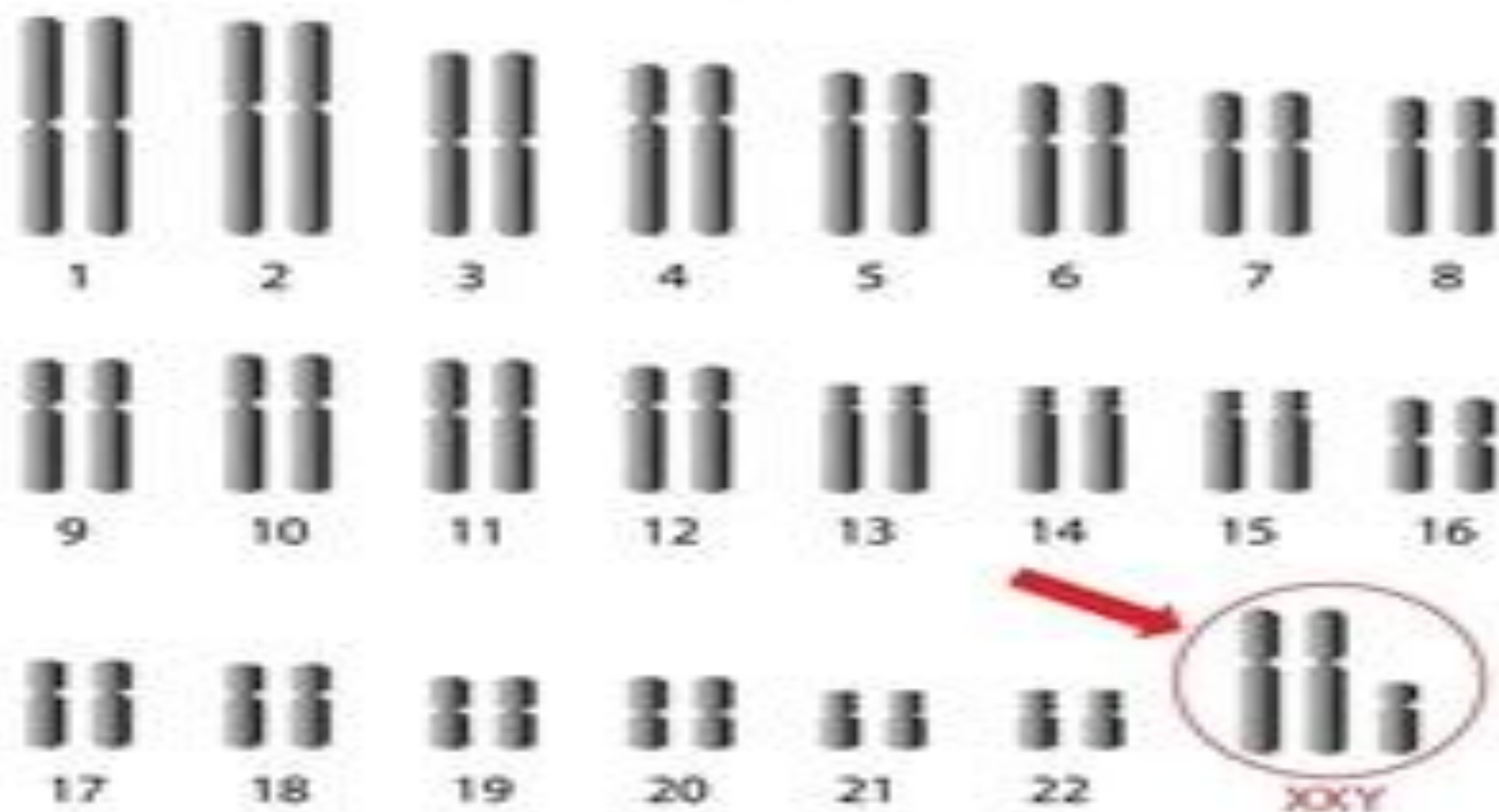
No menstruation



Klinefelter's Syndrome

- The male is characterized to have an extra X chromosome, hence a combination of XXY.
- The individual is physically a male, with penis and testicles, but marked feminine characteristics. He has feminized breast development, and small testes that do not produce sperm.
- Older children and adults with Klinefelter syndrome tend to be taller than their peers.
- Klinefelter syndrome is a chromosomal condition that affects male physical and cognitive development. Its signs and symptoms vary among affected individuals.
- Children with Klinefelter syndrome may have learning disabilities and delayed speech and language development. They tend to be quiet, sensitive, and unassertive

Klinefelter Syndrome



XYY ABNORMALITY

- This is another sex chromosome abnormality in males which results in abnormality large, aggressive males who may become aggressive criminals.

General Principles of Heredity

1. Heredity is determined at the moment of conception.
2. No two individuals are exactly alike.
3. Inheritance is not merely from the father and the mother, but also from the two lines of ancestry of both families.
4. All hereditary qualities are not apparent at birth.
5. what is inherited is the total of potentialities which can manifest themselves only in the course of development under suitable conditions.
6. Acquired characteristics are not inherited.

Stage of growth

- Adulthood(20+years) •
- Youngadulthood(20–39years)
- Middleadulthood(40–60years)
- Elder/Seniorcitizen(60+years)
- Death(unpredictable)
- Decomposition (breakdown of the body after death)

Termss pecify one's age in numbers, such as:

- Baby(0) • Toddler(1-2) • Preschooler(3-4) • Mainchildhood(5-9) •
- Pre-teenager(10-12) • Teenager(13-19) • Twentysomething(20-29) •
- Thirtysomething(30-39) • Fortysomething(40-49) • Fiftysomething(50-59) •
- Sixtysomething(60-69) • Seventysomething(70-79) • Eightysomething(80-89)
- Ninetysomething(90-99) • Centenarian(100-109) • Supercentenarian(110+)

Congenital disorder

- A developing fetus is highly susceptible to anomalies in its growth and metabolism, increasing the risk of birth defects.
- One area of concern is the pregnant woman's life style choices made during pregnancy.
- Diet is especially important in the early stages of development.
- Studies show that supplementation of the woman's diet with folic acid reduces the risk of spina bifida and other neural tube defects.
- Skipping breakfast could lead to a higher risk of prematurity, or other birth defects in the fetus.
- During this time alcohol consumption may increase the risk of the development disorder

- Smoking during pregnancy may also lead to reduced birth weight.
- Some research shows that fetal ultrasounds(including Doppler, 3D/4D ultrasound and 2D ultrasound) can have negative effect on birth weight and neurodevelopment.
- Congenital anomalies are acquired before birth.
- Closure of the ductus can be delayed by the administration of prostaglandins to permit sufficient time for the surgical correction of the anomalies.
- Conversely, in cases of patent ductus arteriosus, where the ductus does not properly close, drugs that inhibit prostaglandin synthesis can be used to encourage its closure, so that surgery can be avoided.

Early childhood

- is a stage in human development. It generally includes toddlerhood and some time afterwards.
- Play age is an unspecific designation approximately within the scope of early childhood.
- In psychology the term early childhood is usually defined as the time period birth until the age of eleven years,

Physical growth and development

- In this phase there is significant synaptic growth and myelination of neural fibers in the brain, especially within the frontal lobes. For example, between the ages 2 and 6, the brain increases from 70% of its adult weight to 90%.
- The growth of the brain is followed by a surge in cognitive abilities.
- Around the age of five, children start speaking properly and master their hand to eye coordination.
- It is optimal that an environment is provided that encourages physical development and allows the children to explore and try out new things. The physical development in children follows a pattern. The large muscles develop before the small muscles. The large muscles are used for walking, running and other physical activities. These are known as gross motor skills. Small muscles are used for fine motor skills such as picking up objects, writing, drawing, throwing and catching

Cognitive growth and development

- Called the preoperational stage (Piaget), child repeatedly asks “Why?”, and is used to build relationships with the child.
- The child can't yet perform the abstract thinking operations, because they do not understand the concepts of logic “This means that they think literally: if a child is told that they have to go to bed because the night is falling, they will ask how the night fall from the sky”.
- They also exhibit egocentrism; not to be confused with egoism;
- There is also a matter of perceptive centration, which causes the children to primarily see what is visually most prominent on someone/something, e.g. if a man has long hair, the child will think he's a woman.

Social-emotional growth and development

- This includes children understanding a sense of 'self', relationships with others and sociability. The emotional development includes expressions, attachment and personality. Children manifest fear of dark and monsters and around the age of three notice whether they are a boy or a girl and start acting that way. Boys are usually more aggressive, whilst girls are more caring. However, aggression is manifested in two different ways: boys are more physically aggressive, while the girls are more socially aggressive (name-calling and ignoring). In this stage the individual differences become more prominent.

Physical development

Gross motor skills

- Between ages 2 and 3 years, young children stop using the awkward, wide-legged robot-like stance that is the hallmark of new walkers. As they develop a smoother gait, they also develop the ability to run, jump, and hop.
- Children of this age can participate in throwing and catching games with larger balls. They can also push themselves around with their feet while sitting on a riding toy.
- The period of the most rapid development of motor behaviors is between 2 and 6 years (also known as the preschool years). Skills that appear are basic locomotor, ball-handling, fine eye–hand coordination, walking leads to running, jumping, hopping, galloping, and skipping, climbing evolves from creeping.

8 Basic locomotor Skills (move the body from one location to another)

- Walking
- Running
- **Jumping** : Going up and down, with both feet in the air at once
- **Hopping**: Moving up and down on one foot
- **Skipping** (Alternating steps and hops)
- **Sliding**: Galloping sideways
- **Galloping**: Traveling with one foot always in the lead
- **Leaping** (Jumping forward or back with one leg outstretched; taking off on one foot and landing on the other)

Fine motor skills

- There are several developmental expectations for children to reach by the time they reach the age of 2.
- Children are expected to be able to draw simple shapes such as circles, square and triangles.
- They should also be able to cut out such shapes as these.
- By doing such activities as these develops the children's fine motor skills, by strengthening

Education

- Infants and toddlers experience life more holistically than any other age group
- Social, emotional, cognitive, language, and physical lessons are not learned separately by very young children.
- The most information learned occurs between birth and the age of three, during this time humans develop more quickly and rapidly than they would at any other point in their life.
- Love, affection, encouragement and mental stimulation from the parents or guardians of these young children aid in development.
- At this time in life, the brain is growing rapidly and it is easier for information to be absorbed; parts of the brain can nearly double in a year. During this stage, children need vital nutrients and personal interaction for their brain to grow properly.
- The most important way children develop is interaction with other children. Children develop close relationships with the children they spend a large period of time with.
- Close relationships with peers develop strong social connections that can be transferred later in life, even children at an early age have a preference of whom they want to interact with or form friendships with.

Child

- Biologically, the child is a human being between the stages of birth and puberty.
- There are many social issues that affect children, such as childhood education, bullying, child poverty, dysfunctional families, child labor, hunger, and child homelessness.
- The United Nations Convention on the Rights of the Child defines child as “a human being below the age of 18
- Children generally have fewer rights than adults and are classed as unable to make serious decisions, and legally must always be under the care of a responsible adult or child custody, whether their parents divorce or not.

Child Development

- Every child goes through many stages of social development.
- An infant or very young child will play alone happily.
- Next, the child can play with another child, gradually learning to share and take turns.
- Eventually, the group grows larger, to three or four children. By the time a child enters kindergarten, he or she can usually join in and enjoy group experiences.
- Children with ADHD and learning disabilities may need extra help to develop social skills.
- The impulsive characteristics of an ADHD child may lead to poor peer relationships.

Child Development

- Children from the age of seven forward were considered responsible for their actions.
- They may be sent to special correctional institutions, such as juvenile hall.
- The infant mortality rate dropped from 90 deaths/ 1,000 live births in 1990, to 45 (2017)
- Education is compulsory in most places up to a certain age
- Due to the risk of sexual violence and attacks in schools and other factors that keep children out of school are: include poverty, child labor, social attitudes, and long distances to school.
- Child marriage was common in human history. Today child marriage rates reach 75% in Niger and 68% in Central African Republic and Chad, 66% in Bangladesh and 47% in India

Child protection

- Protection of children from abuse is considered an important goal.
- This includes protecting children from exploitation such as child labor, child trafficking and selling, child sexual abuse, military use of children, and child laundering in illegal adoptions.
- There exist several international instruments for these purposes, such as:
 - Worst Forms of Child Labour Convention
 - Minimum Age Convention, 1973
 - Optional Protocol on the Sale of Children, Child Prostitution and Child Pornography
 - Council of Europe Convention on the Protection of Children against Sexual Exploitation and Sexual Abuse
 - Optional Protocol on the Involvement of Children in Armed Conflict
 - Hague Adoption Convention
 - European Union's *Directive 2011/92/EU of the European Parliament and of the Council* of 13 December 2011 on combating the sexual abuse and sexual exploitation of children and child pornography.

Preadolescence

- **Preadolescence**, also known as **pre-teen** or **tween**, is a stage of human development following early childhood and preceding adolescence.
- It commonly ends with the beginning of puberty, but may also be defined as ending with the start of the teenage years, it as 10–13 yrs.
- Preadolescence can bring its own challenges and anxieties.
- Preadolescence may also be defined as the period from 9 to 14 years
- *preadolescent* in psychology, the terms *preteen*, *preteenager* or *tween*

Preadolescence

- Of the 'two major socializing agents in children's lives: the family environment...and formal educational institutions
- Preadolescent children in fact have a different view of the world from younger children in many significant ways.
- Theirs is a more realistic view of life than the intense, fantasy-oriented world of earliest childhood.
- Preadolescents have more mature, sensible, realistic thoughts and actions: 'the most "sensible" stage of development...the child is a much *less emotional being*

Preadolescence

- They will often have developed a sense of *intentionality* and will have a more developed sense of looking into the future and seeing effects of their actions (as opposed to early childhood where children often do not worry about their future).
- This can include more realistic job expectations (“I want to be an engineer when I grow up”).
- Middle children generally show more investment 'in *control over external reality* through the acquisition of knowledge and competence’
- where they do have worries, these may be more a fear of kidnappings, rapes, and scary media events, as opposed to fantasy things (e.g., witches, monsters, ghosts).

Preadolescence

- Preadolescents may well view human relationships differently (e.g. they may notice the flawed, human side of authority figures).
- They may begin to develop a sense of self-identity, and to have increased feelings of independence.
- A different view on morality can emerge
- Many preadolescents will often start to question their home life and surroundings around this time and they may also start to form opinions that may differ from their upbringing in regards to issues such as politics, religion, sexuality, and gender roles.
- Greater responsibility within the family can also appear, as middle children become responsible for younger siblings and relatives.

Preadolescence

- Middle children often begin to experience infatuation, limerence, puppy love, or love itself, though arguably at least with 'girls carrying out all the romantic interest....
- preadolescent girls' romantic pursuits often seem to be more aggressive than affectionate.
- Preadolescents may still suffer tantrums at the age of 13, sometimes leading to rash decisions regarding risky actions.
- Such decisions may in rare cases result in grave situations such as accidental death.
- **Home from home:** come to school for something to be added to their lives; to find a home from home...
- **Media:** be more exposed to popular culture than younger children

Puberty & Adolescence

- Puberty is the process of physical changes through which a child's body matures into an adult body capable of sexual reproduction.
- It is initiated by hormonal signals from the brain to the gonads: the ovaries in a girl, the testes in a boy.
- Physical growth—height and weight—accelerates in the first half of puberty and is completed when an adult body has been developed.

Puberty & Adolescence

- On average, girls begin puberty around ages 10–11 and end puberty around 15-17; boys begin around ages 11–12 and end around 16-17.
- The major landmark of puberty for females is menarche, the onset of menstruation, which occurs on average between ages 12–13
- Puberty which starts later than usual is known as delayed puberty.
- The word puberty describes the physical changes to sexual maturation, not the psychosocial and cultural maturation denoted by the term adolescent development

Differences between male and female puberty

- Two of the most significant differences between puberty in girls and puberty in boys are the age at which it begins, and the major sex steroids involved, the testosterone and the estrogens.
- Although there is a wide range of normal ages, girls typically begin the process of puberty at age 10 or 11; boys at ages 11–12
 - 1 Follicle-stimulating hormone - FSH
 - 2 Luteinizing hormone - LH
 - 3 Progesterone
 - 4 Estrogen
 - 5 Hypothalamus
 - 6 Pituitary gland
 - 7 Ovary
 - 8 Pregnancy - hCG (Human chorionic gonadotropin)
 - 9 Testosterone
 - 10 Testicle
 - 11 Incentives
 - 12 Prolactin - PRL

Effects of early and late puberty onset

- In general, girls who enter puberty late experience positive outcomes in adolescence and adulthood while girls who enter puberty early experience negative outcomes.
- Boys who have earlier pubertal timing generally have more positive outcomes in adulthood but more negative outcomes in adolescence
- **Changes in males**
 - Size and virility الذكورة او الرجولة -Pubic hair -Body and facial hair- Voice change and Adam's apple
 - Male musculature and body shape -Body odor and acne
- **Changes in females**
 - Breast development -Pubic hair -uterus, ovaries
 - Menstruation and fertility -Body shape, fat distribution, and body composition
 - Body odor and acne

Variations

- Age of onset
- Genetic influence and environmental factors (direct genetic effects at least 46% of the variation of timing of puberty, in well-nourished populations)
- Hormones and steroids
- Nutritional influence
- Obesity influence and exercise Scientific researchers have linked early obesity with an earlier onset of puberty in girls. A high level of exercise (athletic) slows puberty.
- Physical and mental illness: Chronic diseases can delay puberty in both boys and girls
- Stress and social factors: social influences are small(shifting timing by a few months rather than years). Most of the studies have reported that menarche may occur a few months earlier in girls in high-stress households, whose fathers are absent during their early childhood

Variations of sequence

The sequence of pubertal development can occasionally vary.

For example, in about 15% of boys and girls, pubarche (the first pubic hairs) can precede, respectively, gonadarche and thelarche by a few months. Rarely, menarche can occur before other signs of puberty in a few girls.

- **Neurohormonal process:** The endocrine reproductive system consists of the hypothalamus, the pituitary, the gonads, and the adrenal glands, with input and regulation from many other body systems. True puberty is often termed “central puberty” because it begins as a process of the central nervous system.

A simple description of hormonal puberty is as follows:

- 1. The brain’s hypothalamus begins to release pulses of GnRH.
- 2. Cells in the anterior pituitary respond by secreting LH and FSH into the circulation.
- 3. The ovaries or testes respond to the rising amounts of LH and FSH by growing and beginning to produce estradiol and testosterone.
- 4. Rising levels of estradiol and testosterone produce the body changes of female and male puberty.