

## UNIT 20

### HUMAN GROWTH AND DEVELOPMENT

**Growth:** The speed with which normal growth occurs in length before birth and in length after birth is known as growth.

**Development:** It is defined as the acquisition of knowledge, skill, attitude and behavior from conception to child birth and up to adulthood.

#### Stages of Growth and Development

1. **Neonate:** The newborn infant up to the age of 6 weeks is known as neonate.
2. **Infant:** The child from the time of birth to one year of age is known as infant.
3. **Toddler:** A young child especially one who is learning or has recently learned to walk (age between 1 to 3 years) is known as toddler.
4. **Childhood:** The human of the age between the infancy and the puberty is known as childhood.
5. **Puberty:** Puberty is the time in which a child's sexual and physical characteristics mature. It occurs due to hormone changes. During puberty, endocrine glands produce hormones that cause body changes and the development of secondary sex characteristics.
6. **Adolescence:** Adolescence is the time between the beginning of sexual maturation (puberty) and adulthood. The adolescent experiences not only physical growth and change, but also emotional, psychological, social, and mental change and growth.
7. **Adulthood:** The period in the human lifespan in which full physical and intellectual maturity have been attained. Adulthood is commonly thought of as beginning at age 20 or 21 years. Middle age, commencing at about 40 years, is followed by old age at about 60 years.

#### Differences between Growth and Development

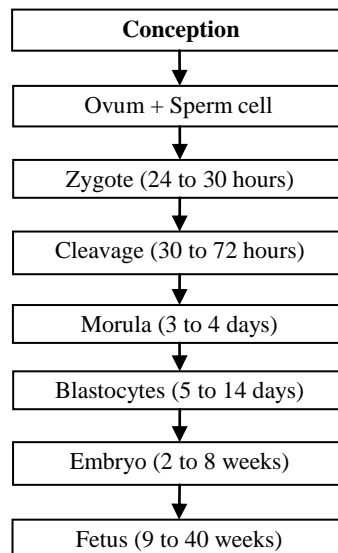
No	Growth	Development
1.	The term is used in purely physical sense. It generally refers to increase in size and length.	Development implies overall change in shape form or structure resulting in improved working and functioning.
2.	Changes in the quantitative aspects come into the domain of growth.	Changes in the quality or character rather than the quantitative aspects come in this domain.
3.	It is a part of developmental process.	It is comprehensive and wider term and refers to overall changes in the individual.
4.	Growth does not continue throughout life. It stops when maturity has been attained.	Development is a wider and comprehensive term and refers to overall changes in the individual. It continues throughout life and is progressive.
5.	Growth involves body changes.	Development changes goal of maturity.
6.	Growth may or may not bring development.	Development is also possible without growth.

#### EMBRYO AND FETUS DEVELOPMENT

**Embryo:** The developing fertilized ovum from 2<sup>nd</sup> weeks to 8<sup>th</sup> weeks of pregnancy is known as embryo.

**Fetus:** The developing child in the uterus from seven to eight weeks after fertilization until birth is known as fetus.

## Stages of Embryo and Fetal Development



## FETAL CIRCULATION

The flow of deoxygenated blood from the fetus to the placenta through the umbilical artery and the returning of oxygenated blood from the placenta to the fetus through the umbilical vein are known as fetal circulation.

- The umbilical vein carries oxygenated blood from fetus.
- Ductus venosus is a continuation of umbilical vein that returns blood directly into inferior venacava and most of the blood therefore bypass the non-functional liver.
- Foramen ovale forms a valve like opening allowing blood to flow between right and left atrium, so that most of the blood bypass non-functional lungs.
- Ductus arteriosus, a small vessel that connects the pulmonary artery to descending aorta, diverts more blood into systemic circulation, meaning that very little blood pass through fetal lungs.
- Two umbilical arteries which are extension of internal iliac artery carry deoxygenated blood to placenta.

