

Human Growth and development
week 3

Factors Influences on growth and development

- **Learning Objectives**

At the end of this Part, the student should be able to:

- Discuss the factors affecting growth and development:
 - a. Hereditary factors, Genetic potentials, Environmental factors, Socioeconomic, Nutrition.
 - b. Exposure to teratogens.
 - c. Infectious diseases and accidents.

- **Factors Influences on growth and development**

1. Hereditary factors.
2. Genetic potentials.
3. Environmental factors.
4. Exposure to teratogens.
5. Endocrine functioning.
6. Infectious diseases and accidents
7. Socioeconomic.
8. Nutrition

1. Hereditary and Genes

2. **Heredity:** Inherited characteristics have a profound influence on development. A height co-relation exists between parent and child with regard to traits such as height, weight, and rate of growth.
3. **Genes:** Genes are sometimes responsible for certain disease and abnormalities in children. Two common childhood conditions that are caused by genetic defects are Sickle Cell Anemia and Down's Syndrome.

2. Environmental factors: that's contain of the following:

• a. Pre-natal environment

1 Factors related to mothers during pregnancy: -

- Nutritional deficiencies
- Diabetic mother
- Exposure to radiation
- Infection with German measles
- Smoking
- Use of drugs

2 Factors related to fetus

- Mal-position in uterus
- Faulty placental implantation

B. Environmental factors: that's contain of the following:

b. Post-Natal Environment

1.External environment:

- Socio-economic status of the family
- Child's nutrition
- Climate and season
- Child's ordinal position in the family
- Number of siblings in the family
- Family structure (single parent or extended family ...)

2. Internal environment

- Child's intelligence
- Hormonal influences
- Emotions

4. Factors influencing the effect of teratogens

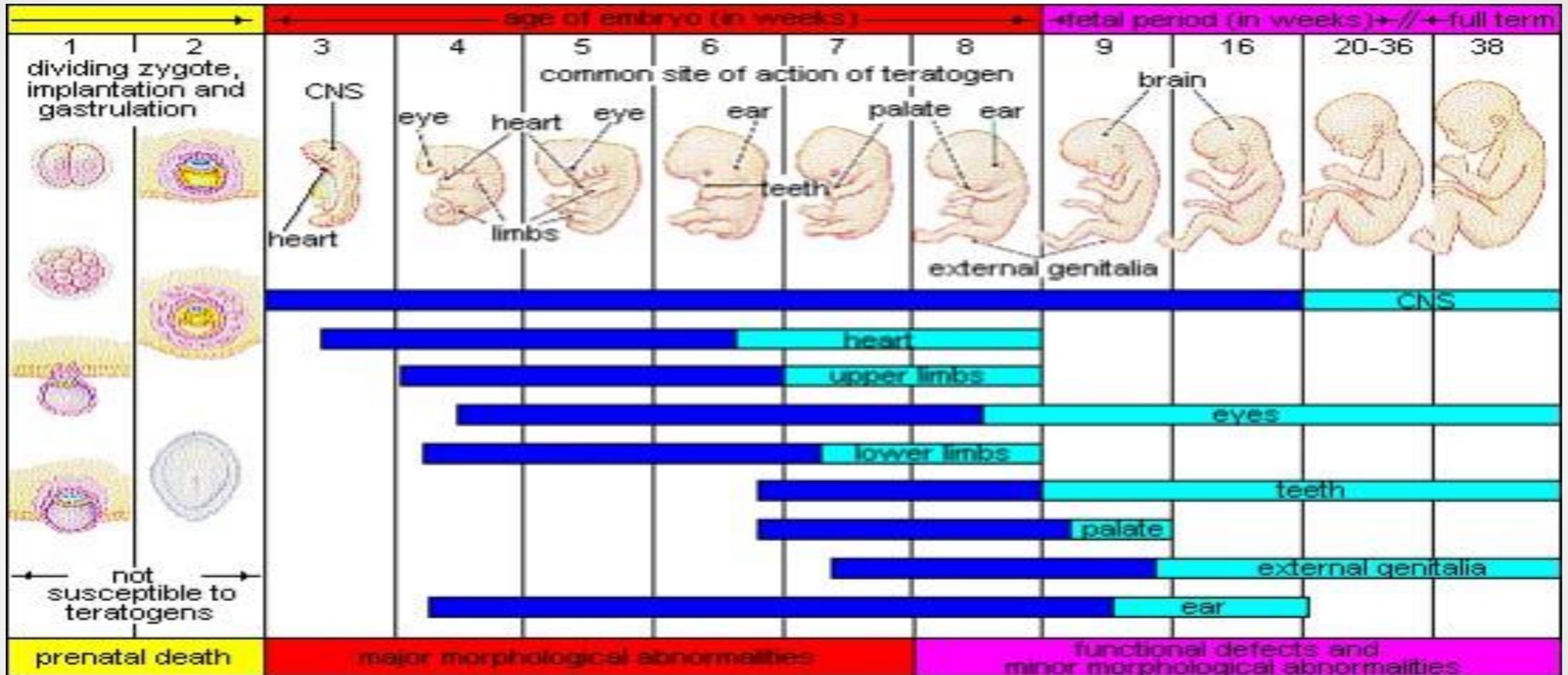
- Today, we know many of the factors that can jeopardize the health of the developing child.
- The study of factors that contribute to birth defects is called teratology.
- **Teratogens** are environmental factors that can contribute to birth defects, and include some maternal diseases, pollutants, drugs and alcohol.

4. Factors influencing the effect of teratogens

The timing of the exposure: Structures in the body are vulnerable to the most severe damage when they are forming.

If a substance is introduced during a particular structure's critical period (time of development), the damage to that structure may be greater.

For example, the ears and arms reach their critical periods at about 6 weeks after conception. If a mother exposes the embryo to certain substances during this period, the arms and ears may be malformed.



1. Figure 2.14 – The development of an embryo into a fetus.

- **4. Factors influencing the effect of teratogens cont:**
- **The amount of exposure:**
 - Some substances are not harmful unless the amounts reach a certain level. The critical level depends in part on the size and metabolism of the mother.
- **The number of teratogens:**
 - Fetuses exposed to multiple teratogens typically have more problems than those exposed to only one.
 - **Genetics:** Genetic makeup also plays a role on the impact a particular teratogen might have on the child.

- **There are four categories of teratogens:**

1. Physical teratogens: These could be saunas, hot tubs, or infections that raise a pregnant woman's body temperature to 102 degrees Fahrenheit or higher. This is associated with neural tube defects, spontaneous abortions, and various cardiovascular abnormalities.

- **There are four categories of teratogens:**

2. Metabolic conditions affecting pregnant females: Metabolic conditions are abnormalities in the chemical process of producing energy from food, and thereby affect the development and function of the body.

If a pregnant woman is malnourished, then her fetus likely lacks the nutrients essential for its development. These include: malnutrition, diabetes, and thyroid disorders.

- **There are four categories of teratogens:**

3. Infections: Different maternal infections, including rubella virus, herpes simplex virus, and syphilis can cause congenital abnormalities in fetuses.

4. Drugs and chemicals: When pregnant females ingest or absorb these, they may cause a variety of different effects based on specific agent, amount of exposure, and timing. This category includes: radiation, heavy metals (including lead), insecticides and herbicides, prescription and over the counter drugs, alcohol, cigarettes, nicotine, caffeine, and even some vitamins.

5. Infectious disease and accidents

a) Teratogens from Animals/Pets

- **Toxoplasmosis**

- This parasite can be passed through cat feces and undercooked meat (especially pork, lamb, or deer meat).
- If the fetus is infected it can cause miscarriage, stillbirth, hydrocephalus, macro or microcephalus, vision issues, and damage to the nervous system.

- **Lymphocytic choriomeningitis**

- This virus carried by rodents including mice, and guinea pigs. If an infected mother passes it to her fetus it can cause issues with brain

5. Infectious disease and accidents

b.) Maternal Infections as Teratogens

- **Rubella** Congenital infection (becoming infected while in the womb) can damage the development of the eyes, ears, heart, and brain and result in deafness.
- **Varicella (chicken pox)**
- Congenital infection can cause a severe form of the infection affecting the eyes, limbs, skin, and central nervous system.
- **Sexually transmitted infections**
- Infections such as HIV, gonorrhea, syphilis, and chlamydia can be passed from the mother during pregnancy and/or delivery.⁵⁰

7. Pituitary and thyroid glands disorders tend to influence growth and development.

8. Socioeconomic. (recedency, economic level, education).

9. Nutrition

- References

- Johnson A., (2019)CHILD GROWTH AND DEVELOPMENT , Editor:, Version 1.2