INTRODUCTION TO DEVELOPMENTAL ANATOMY

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Intended Learning Outcomes

1. Define and state the scope of developmental anatomy
2. Outline the developmental periods
3. Familiarize with key terminologies in developmental anatomy
4. State the significance of embryology

Introduction

* Anatomy – study of structure of the body

* Human anatomy – focuses on the human body

Divisions of Anatomy

Gross Anatomy

* Topographic approach
* Systemic approach

Microscopic Anatomy

* Cytology
* Histology

Developmental Anatomy

Developmental Anatomy

* Study of prenatal development
* Gametogenesis until birth
* Both normal and abnormal development
* Postnatal development, if significant

Prenatal Developmental Periods

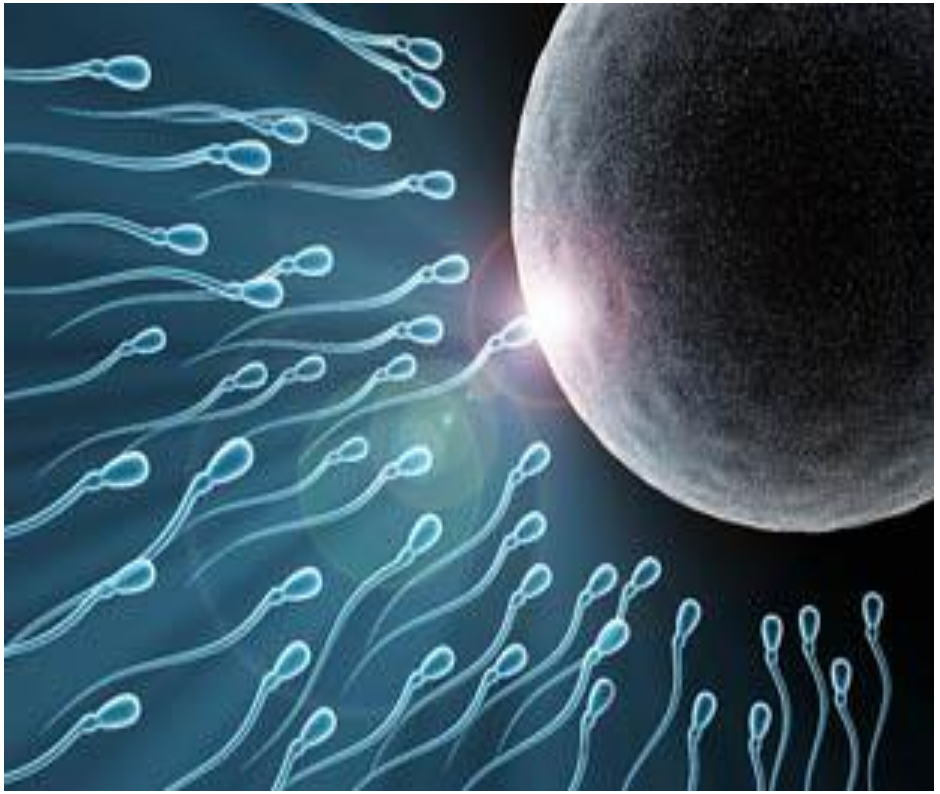
* Gametogenesis – spermatogenesis, oogenesis
* Fertilization (and its outcome)
* Early development (1st and 2nd week)
* Implantation
* Embryonic period (3rd to 8th week)
* Foetal period (9th week until birth)

Definition of terms

* Embryology – Study of developmental process from a single cell to a baby in 9 months
* Embryogenesis – formation and development of an embryo
* Ontogeny – Process of development of an organism

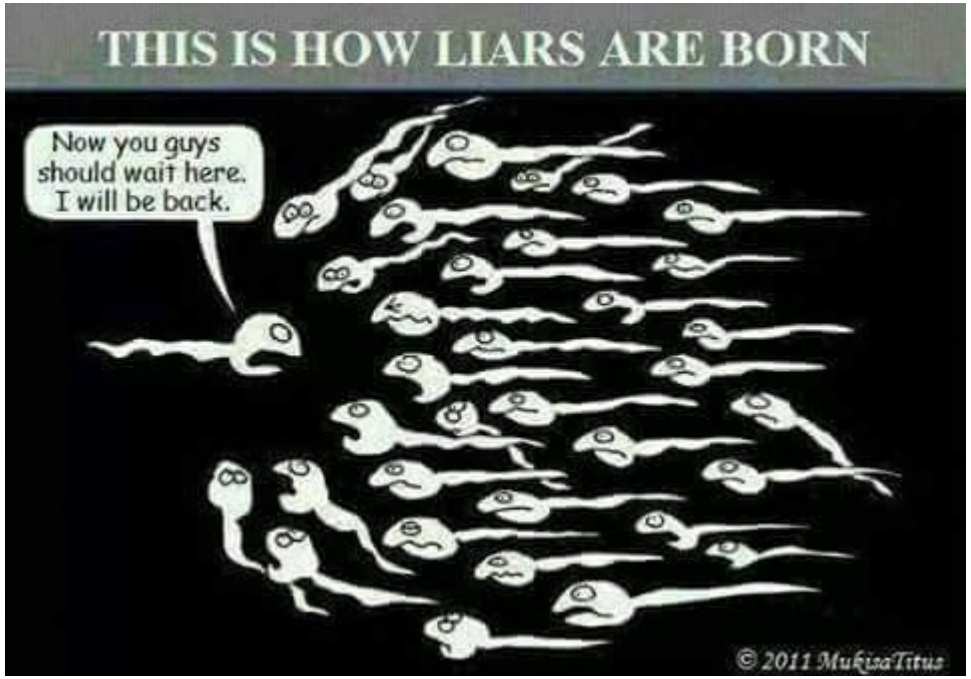
Definition of terms

* Gametogenesis
* Oogenesis
* Spermatogenesis
* Fertilization
* Zygote
* Conceptus



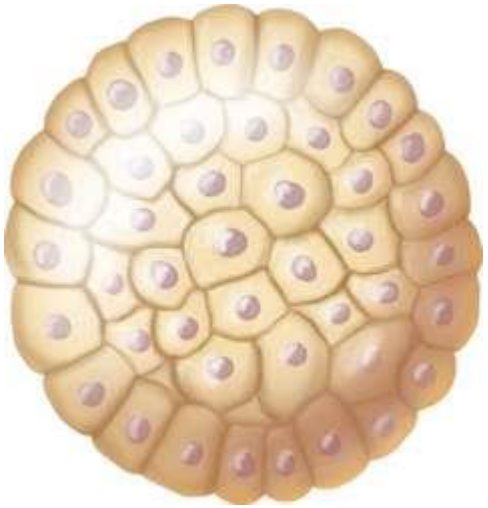
Whenever you feel worthless,
REMEMBER

you were once
the quickest sperm cell.



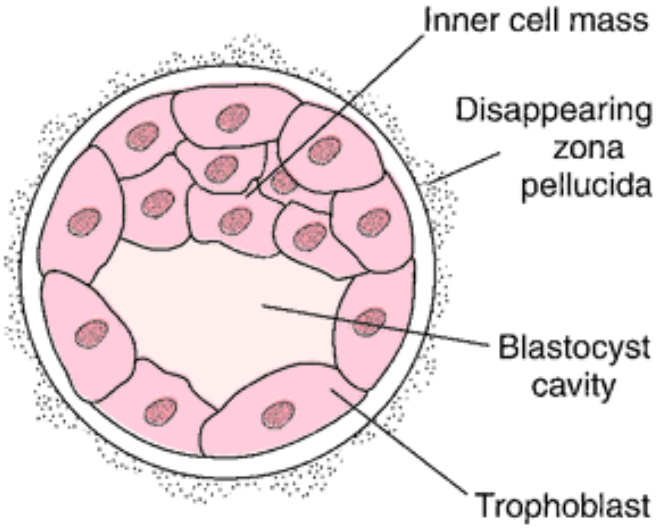
Definitions of Terms

* Cleavage – Series of mitotic cell divisions of the zygote resulting in blastomeres
* Blastomeres are early embryonic cells
* Morula – a mass of **12** to **32** blastomeres



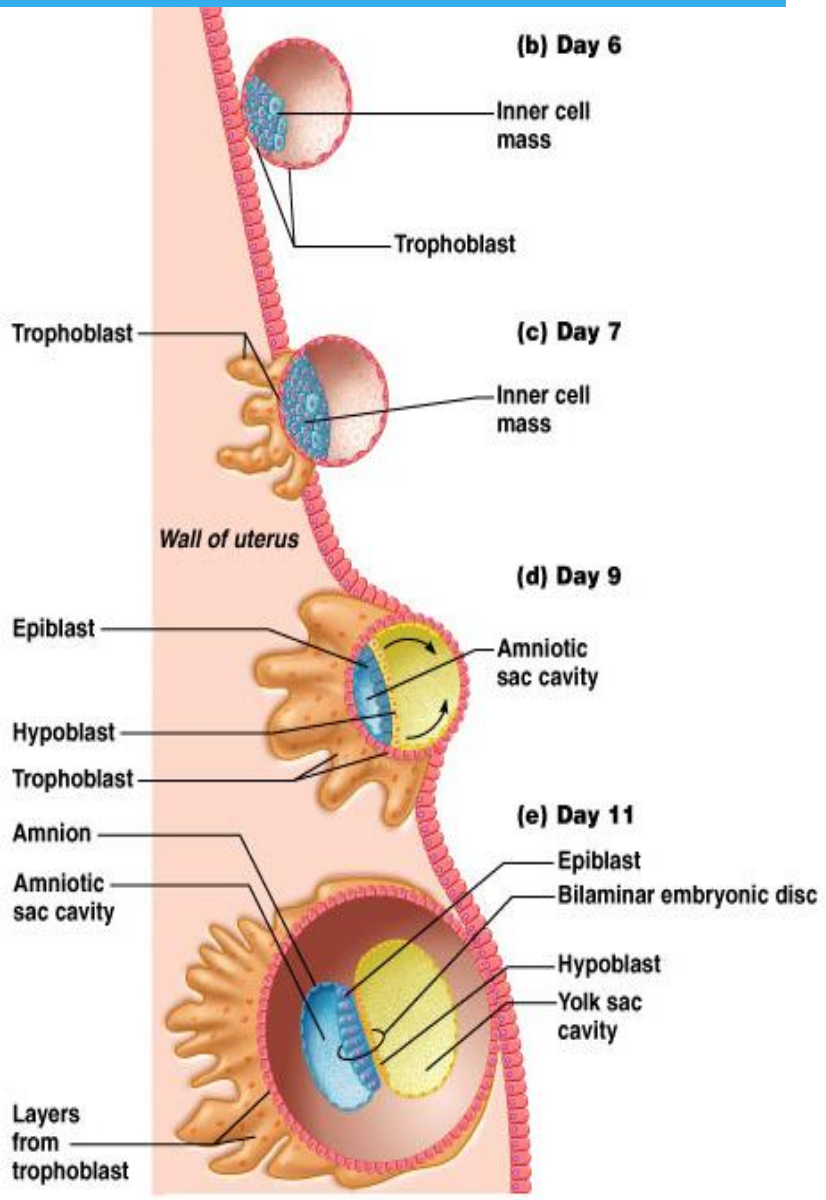
Definition of Terms

* Blastocyct – structure formed after a cavity forms within the morula
* Embryoblast
* Trophoblast

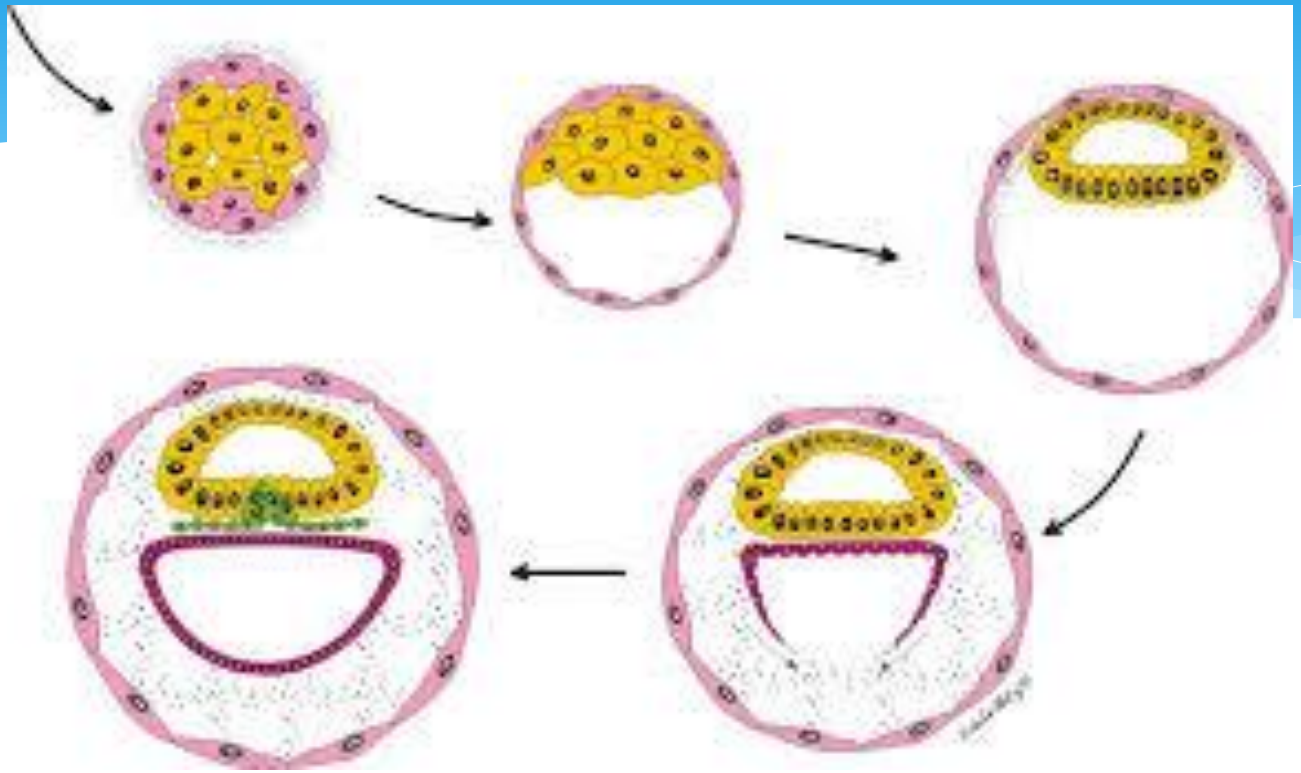


Definition of Terms

* Implantation – Attachment & embedding of the blastocyst to the endometrium
* Endometrium
* Decidua



Definition of Terms



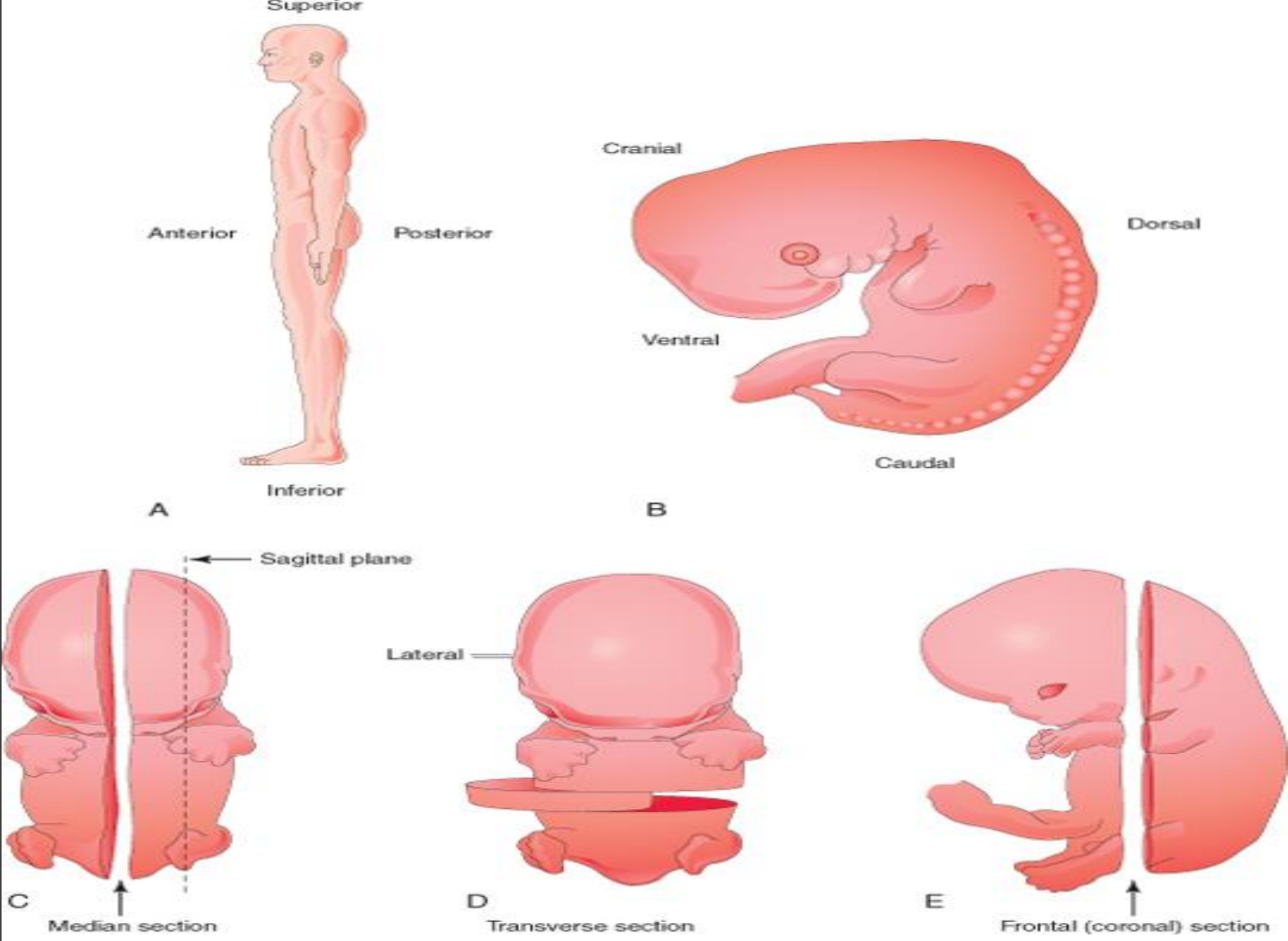
* Bilaminar disc
* Gastrula – trilaminar disc embryo (ectoderm, mesoderm, and endoderm)
* Gastrulation

Definition of Terms

* Neurulation – process of formation of the neural tube, the primordium of the central nervous system
* Primordium – beginning or first discernible indication of an organ or structure
* Organogenesis – formation of body organs
* Morphogenesis – Process of shape development

Definition of terms

* Fetus – unborn offspring (week 9 till birth)
* Trimester - period of *three calendar months* during a pregnancy (roughly 13 weeks each)
* Abortion – expulsion of an embryo or fetus before its viability (capable of living outside the uterus)



Definitions of Terms

* Teratology – Study of birth defects
* Teratogen – An agent that causes congenital defects
* Congenital – born with
* Anomaly – structural abnormality
* Malformation – abnormal developmental process
* Deformation – mechanical distortion

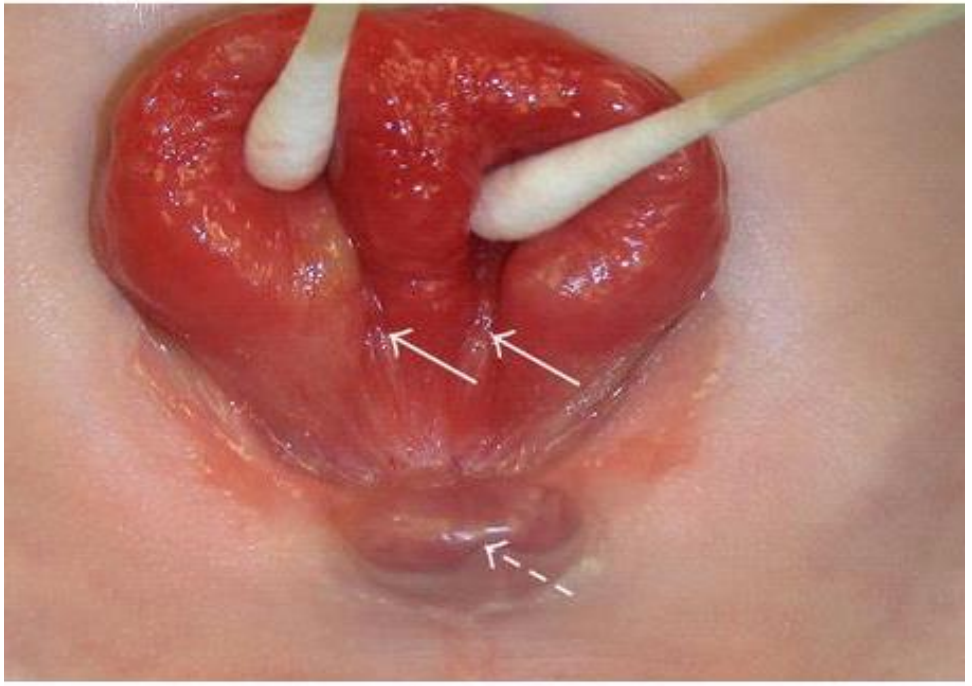
Conjoined twins

Limb defects

CNS Defects

Craniofacial defects

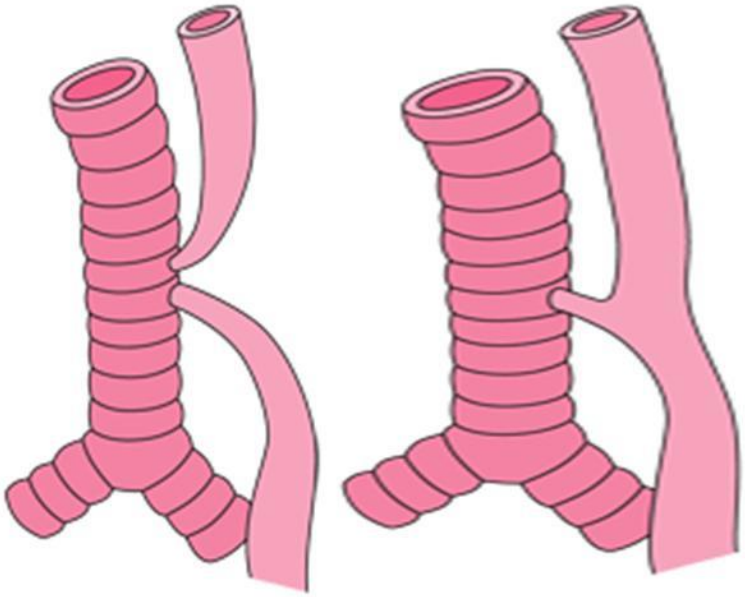
Defects of Urinary system



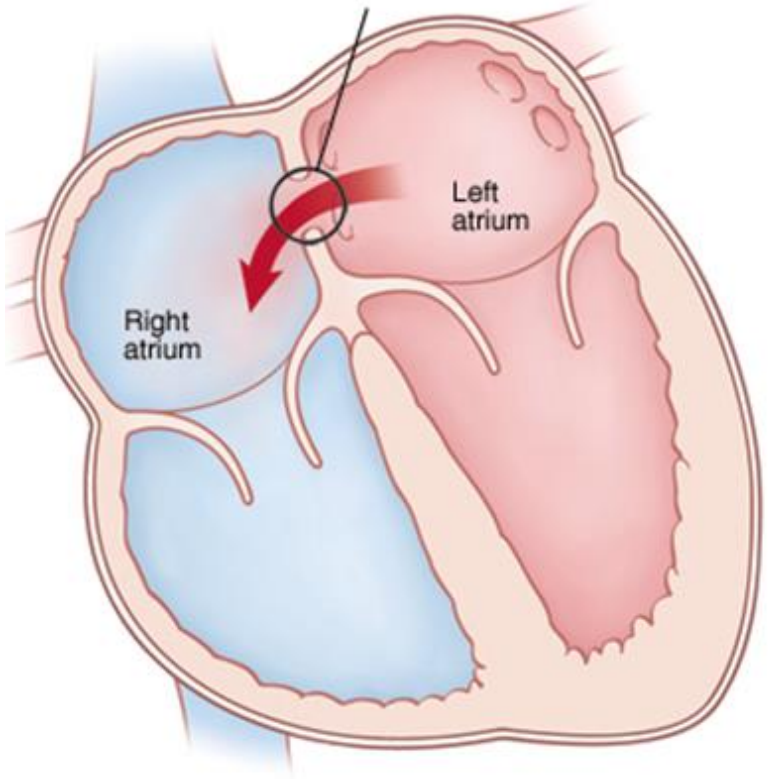
Genital defects

Abdominal wall defects

Defects of the digestive system



Heart Defects



Skin disorders

Postnatal Developmental periods

* Infancy – the first 12 months after birth
* Neonate/newborn – infant aged 1 month or younger
* Childhood – period after infancy until puberty
* Puberty – period when capability of sexual reproduction is attained

Postnatal Developmental periods

* Adolescence – rapid physical and sexual maturation
* Adulthood – grown up - attainment of full growth and maturity
* Senescence - biological aging, characterized by gradual deterioration of function
* Old age

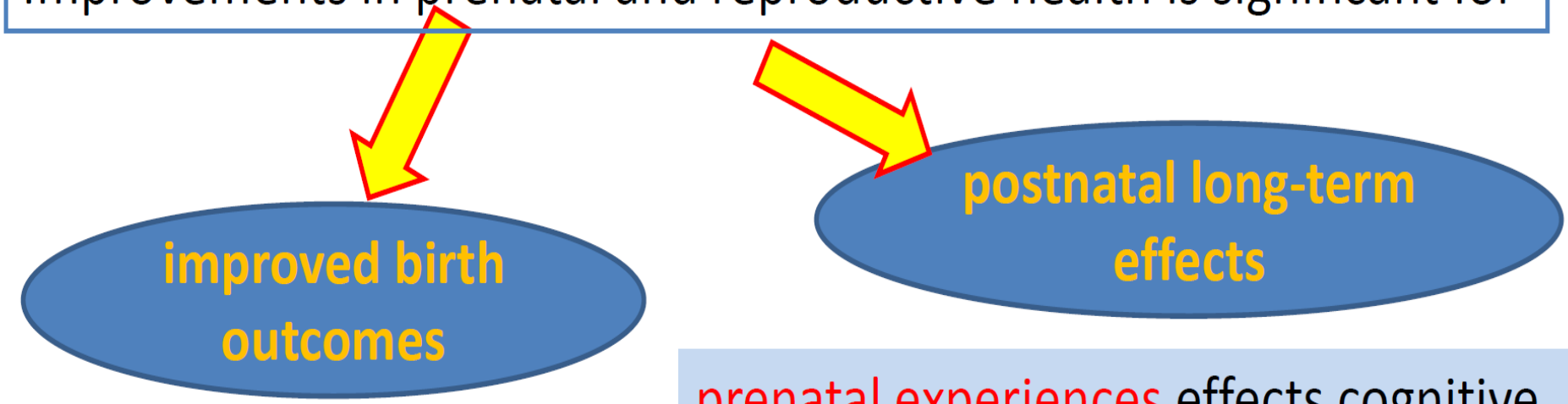
SIGNIFICANCE OF EMBRYOLOGY

* Bridges the gap between prenatal development and obstetrics, perinatal medicine, pediatrics, and clinical anatomy
* Develops knowledge concerning the beginnings of human life and the changes occurring during prenatal development
* Is of practical value in helping to understand the causes of variations in human structure
* Illuminates gross anatomy and explains how normal and abnormal relations develop

Clinical Importance

- Understanding embryology is essential for creating health care strategies;
  1. Prenatal diagnosis and surgical treatments
  2. Therapeutic procedures for infertility
  3. Mechanisms to prevent birth defects

Improvements in prenatal and reproductive health is significant for



prenatal experiences effects cognitive capacity and postnatal health

THANK YOU