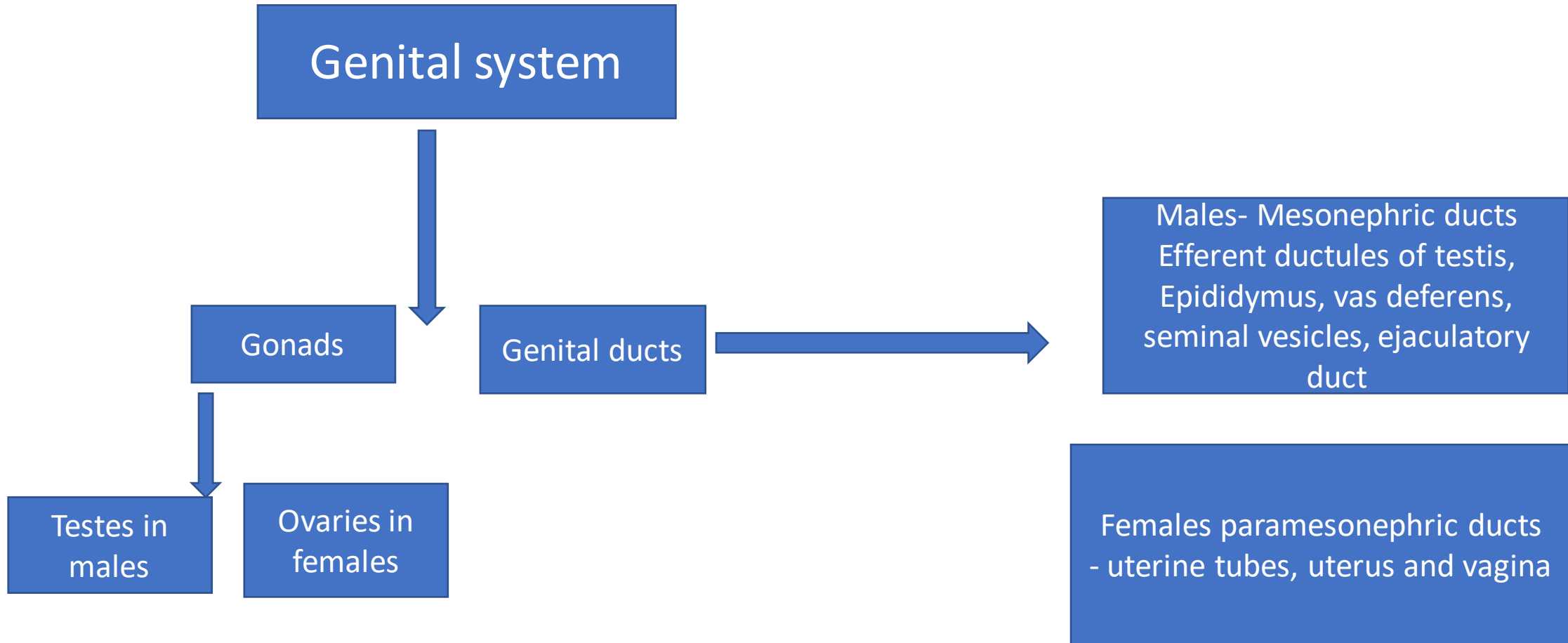


Male reproductive system

Dr. Anjali Sabnis

- Introduction
- Formation of primitive gonads-----
 - a. genital ridge
 - b. Migration primordial germ cells
 - c. Differentiation into definitive gonads
- Development of testis-----Stages of development, Descent, anomalies
- Mesonephric duct
- Development of prostate

Introduction

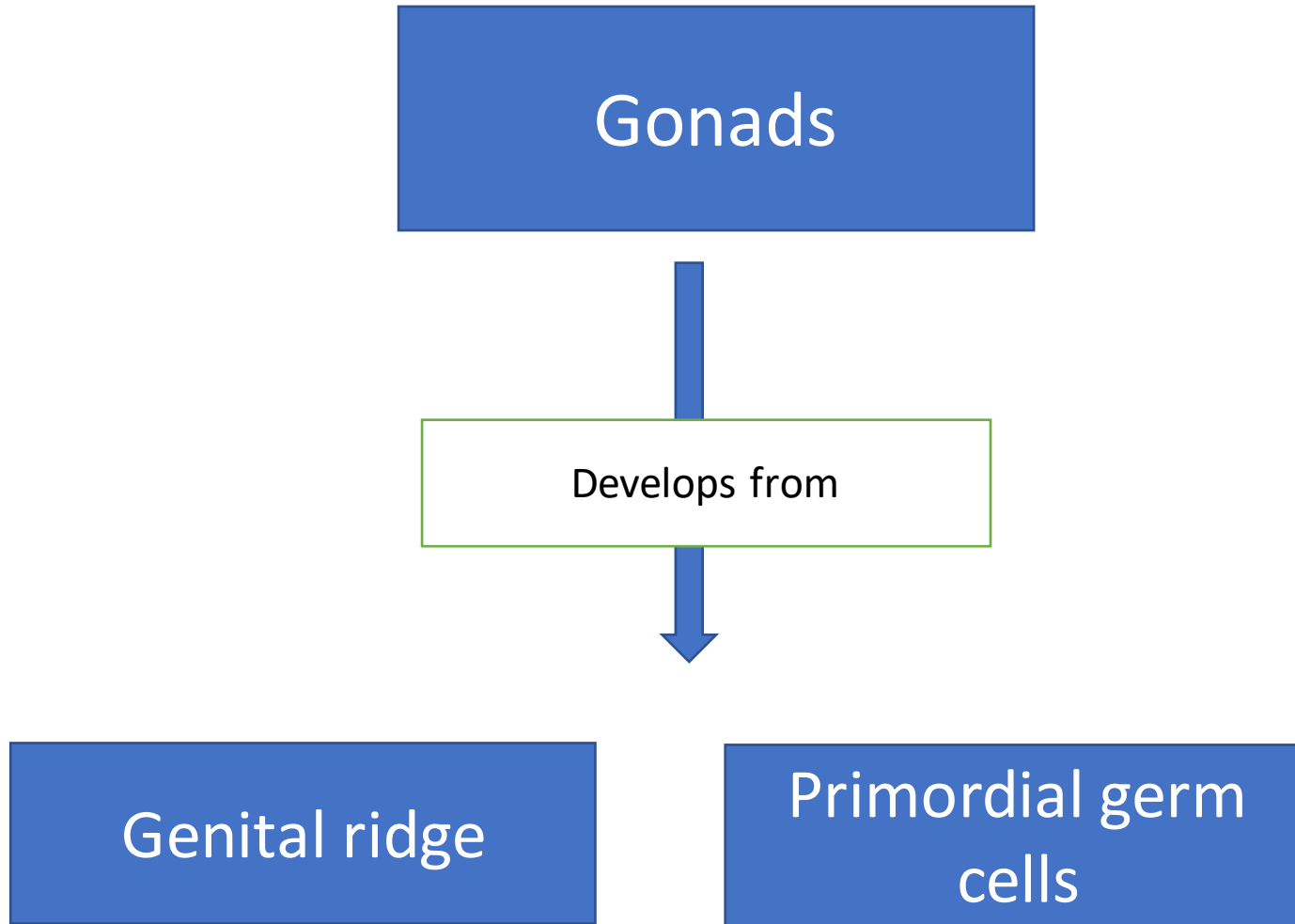


Gonads

Develops from

Genital ridge

Primordial germ
cells



Accessory sex glands

- Males-----prostate, bulbourethral glands
- Females-----greater vestibular glands (Bartholin's glands)

Formation of primitive gonads

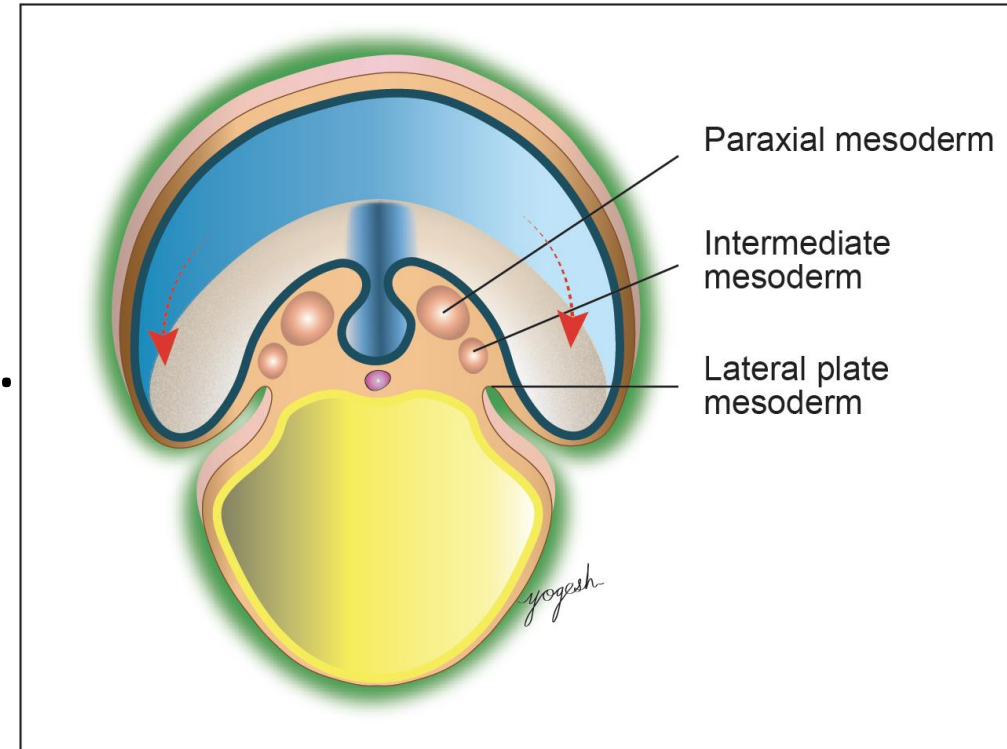
- a. genital ridge
- b. Migration primordial germ cells
- c. Differentiation into definitive gonads

Urinary and genital systems develop from the common sources: Intermediate mesoderm and cloaca.

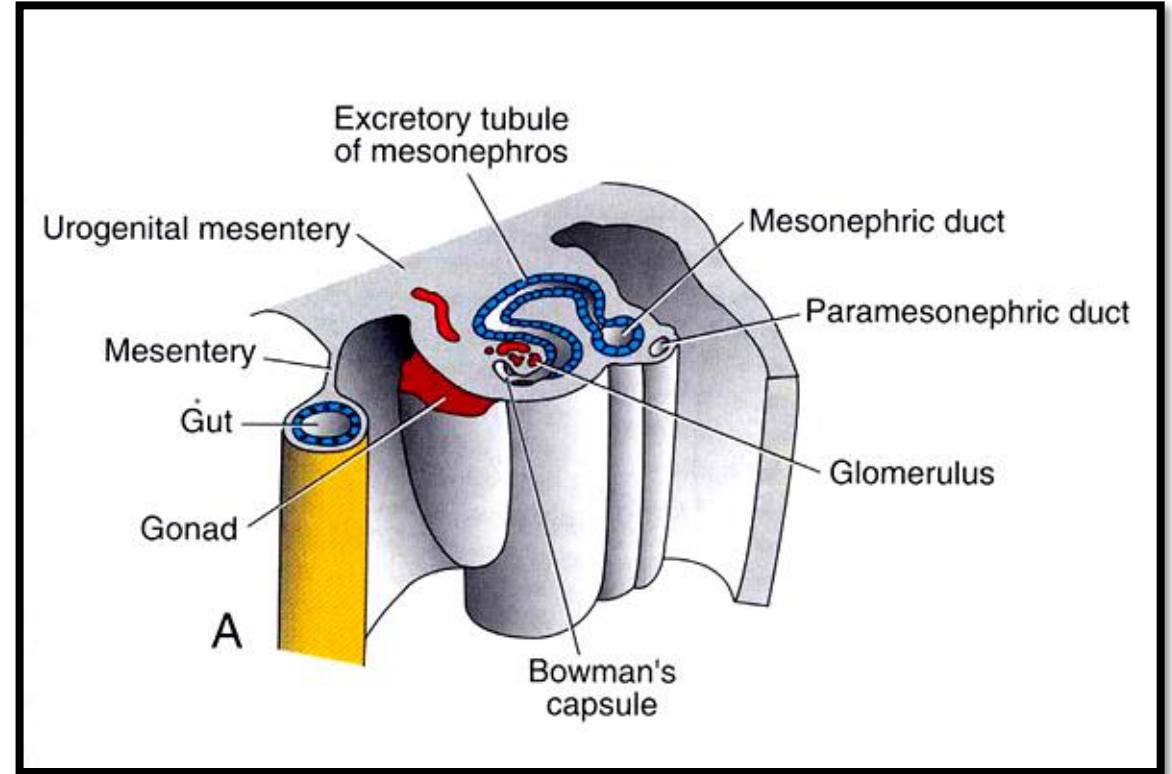
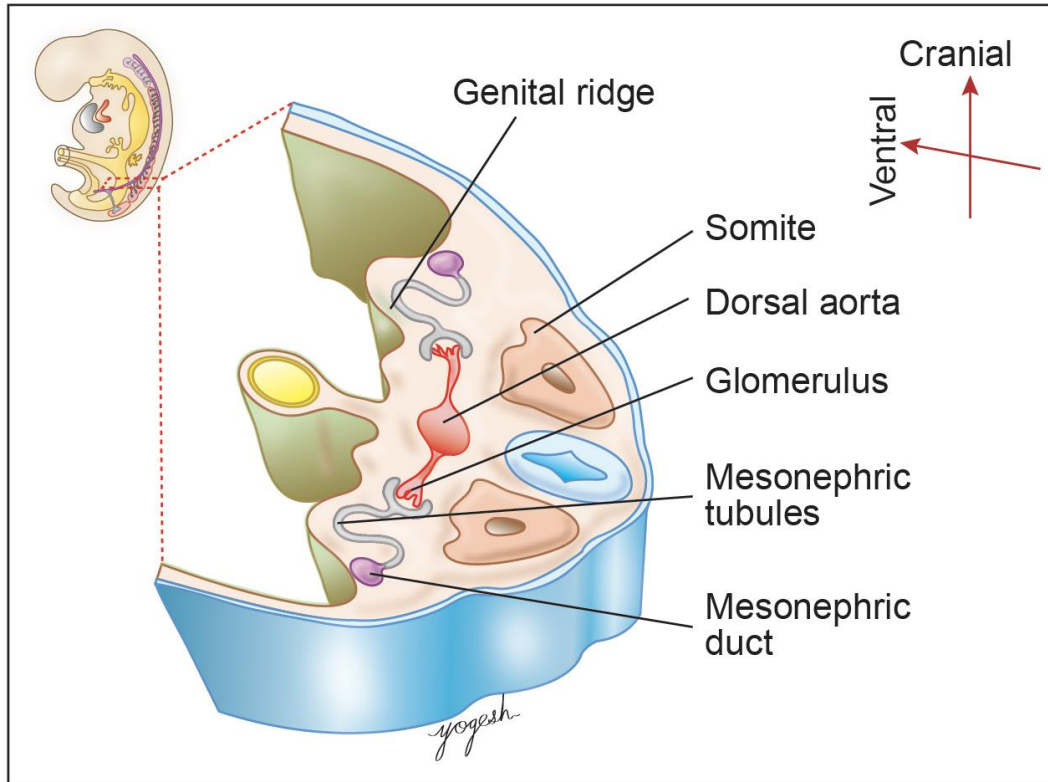
Intermediate Mesoderm

- Three segments:

1. **Paraxial mesoderm** that forms somites.
2. **Intermediate mesoderm** that forms genitourinary system.
3. **Lateral plate mesoderm** that forms somatopleuric and splanchnopleuric layers.

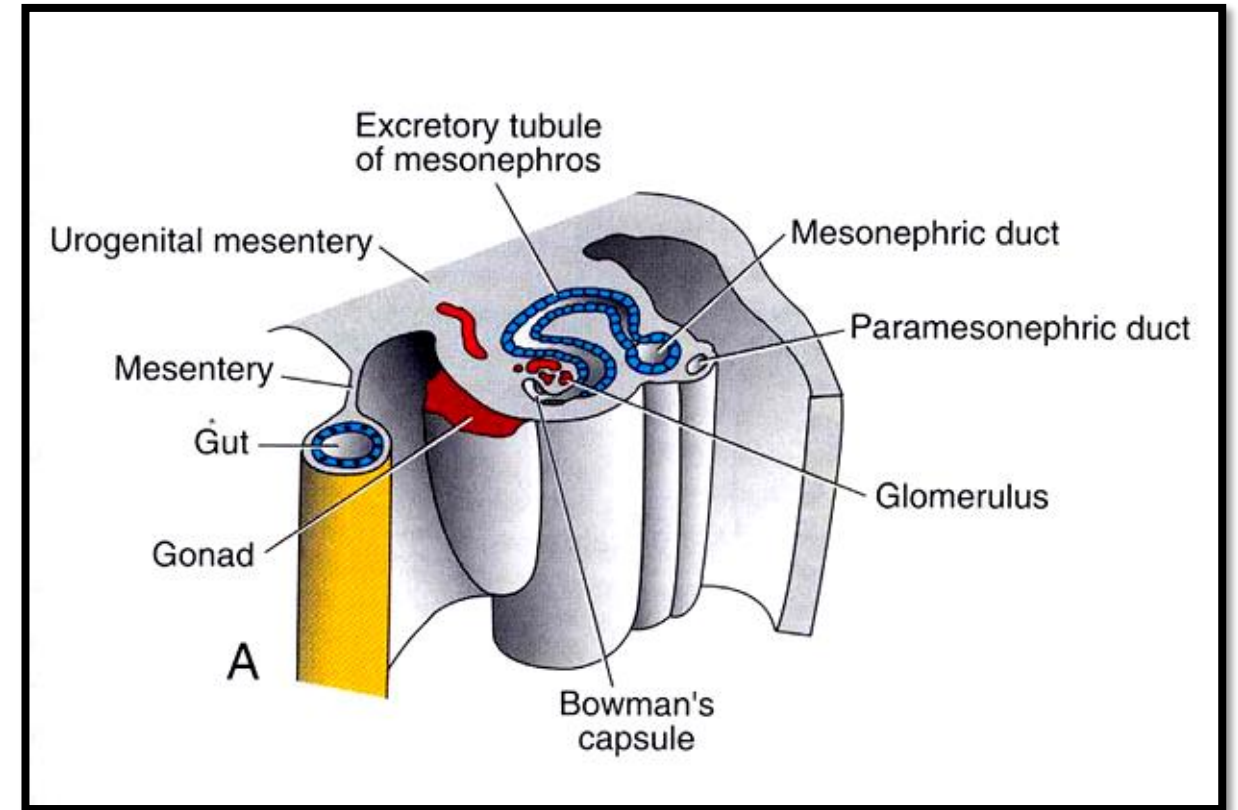


Genital ridge/ gonadal ridge

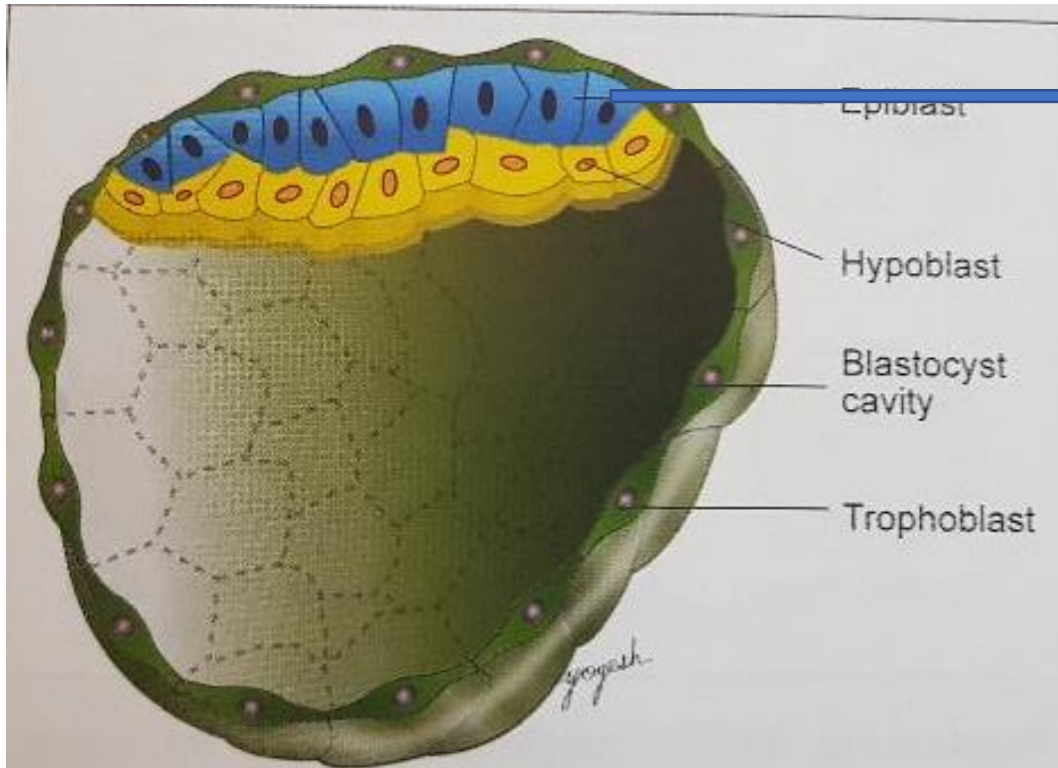


- Coelomic epithelium covering medial surface of mesonephros proliferates to form genital ridge
- GUS develops from genital ridge of intermediate mesoderm
- Genital ridge is an elevation of posterior abdominal wall in between dorsal aorta and mesonephros

- Genital ridge consists of inner medulla and outer cortex
- Testis or ovary arises from genital ridge retroperitoneally on the posterior abdominal wall in lumbar region



Migration primordial germ cells

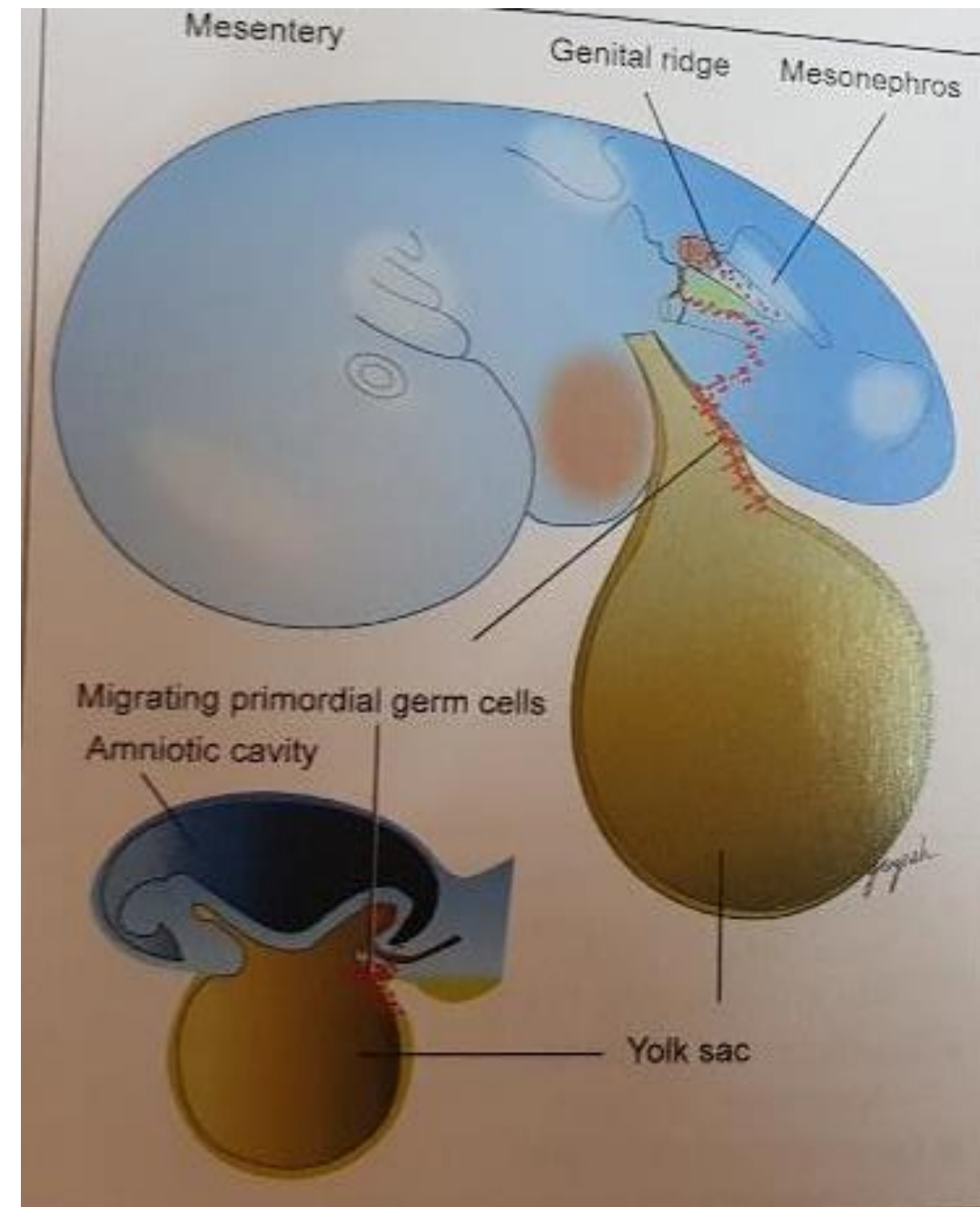


In 2nd week
Primordial germ
cells arise from
epiblast

- PGC remain within extraembryonic mesoderm of connecting stalk and wall of yolk sac
- On formation of the tail fold, PGC come to lie in splanchnopleuric mesoderm that surrounds hindgut
- In 5th wk

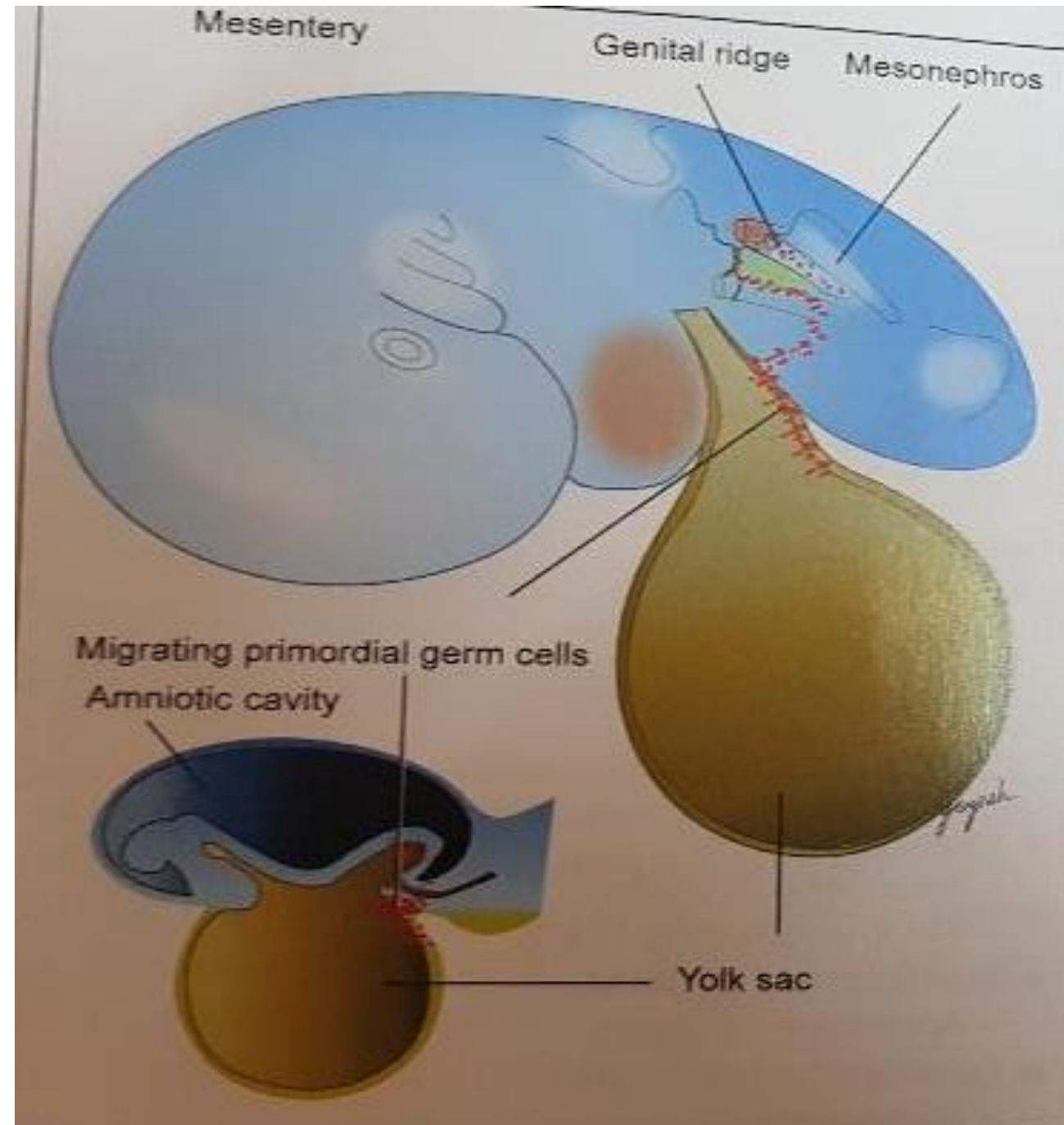
Coelomic epithelium covering mesonephric ridges proliferate to form genital ridges.

Formation of genital ridge is the first sign of gonad formation

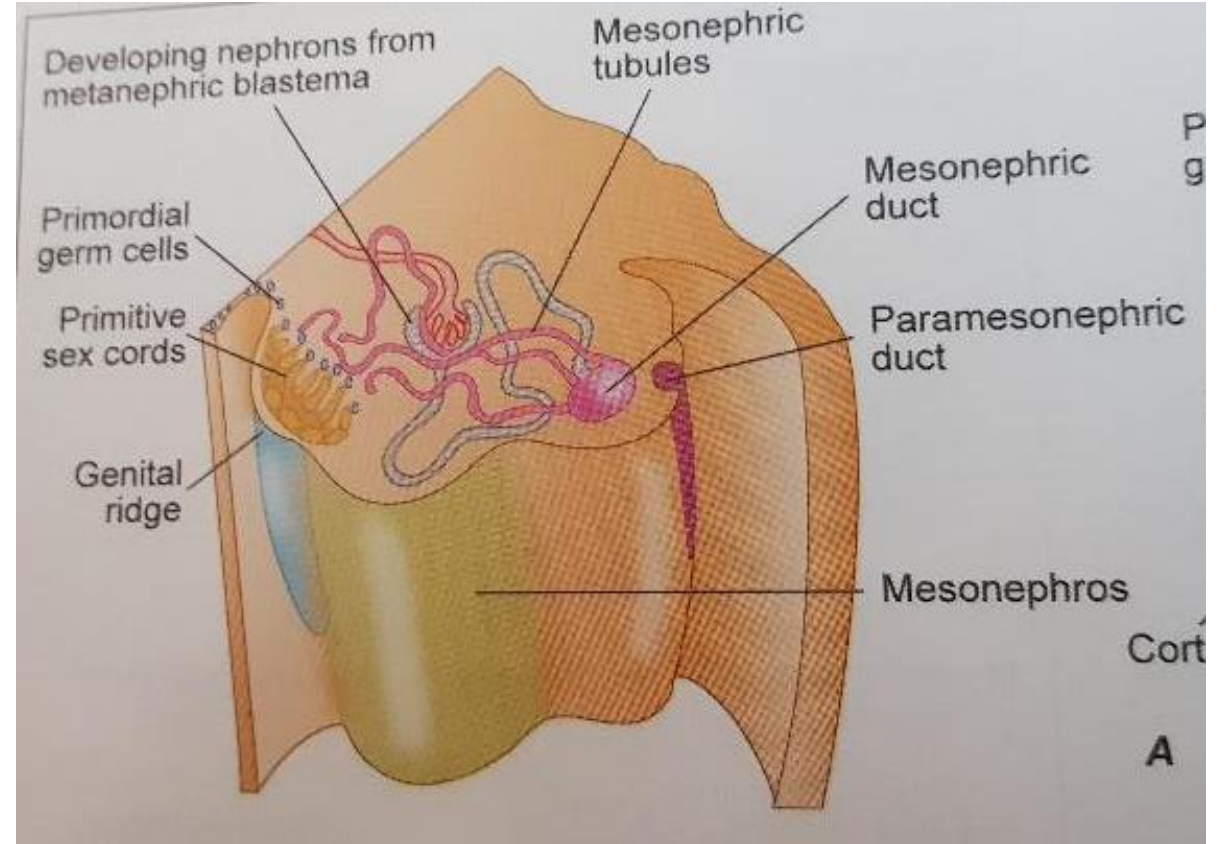


- By 5th wk

PGC migrate bilaterally through dorsal mesentery to the region of genital ridges

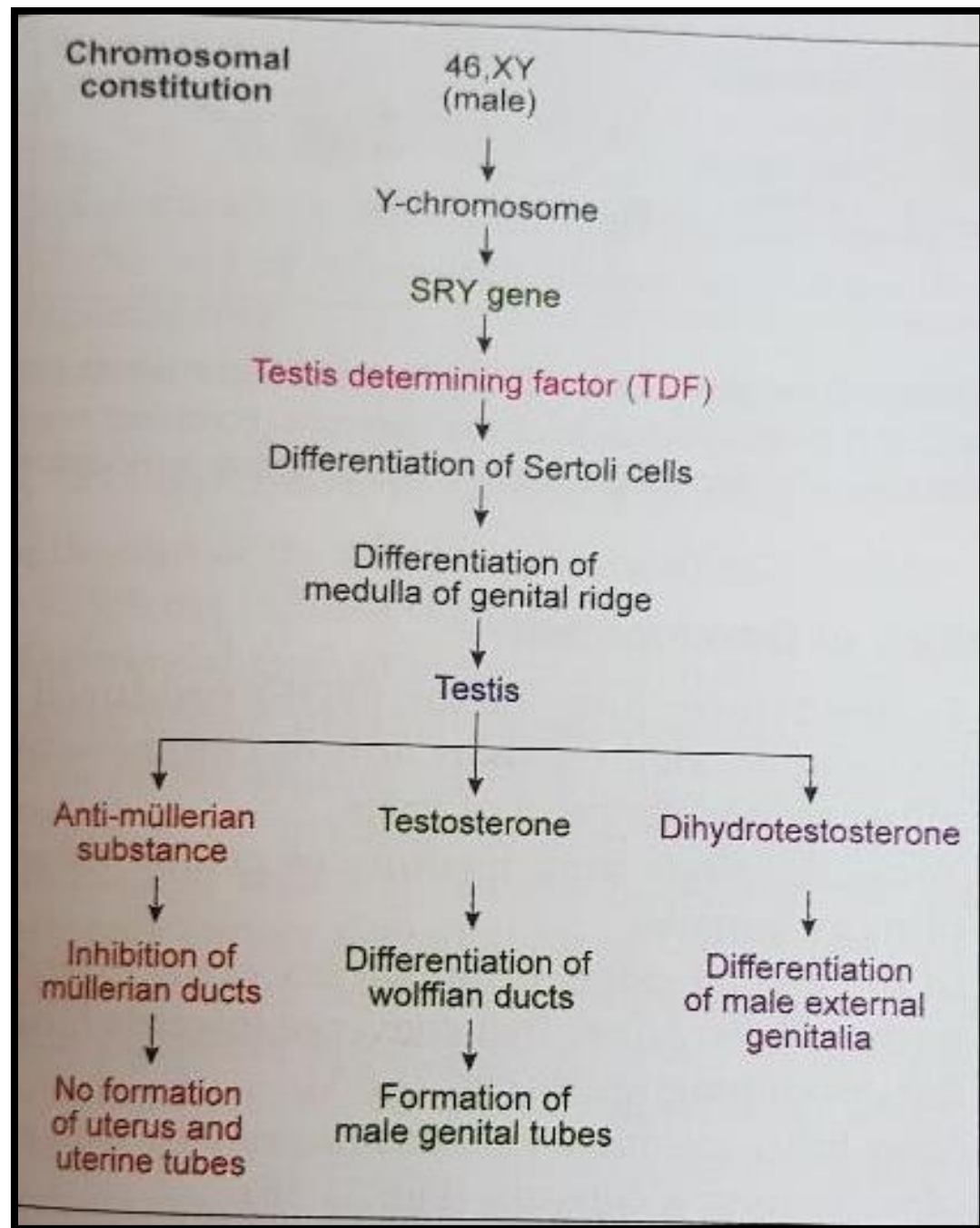


- From surface epithelium, numerous cord like processes develop and enter the genital ridge to form finger like cord called primitive sex cords



Differentiation into definitive gonads

- Up to 7th week of IUL, Gonad is undifferentiated
- Depending on chromosomal constitution, differentiation of genital ridge into testis or ovary happens



GENITAL RIDGE

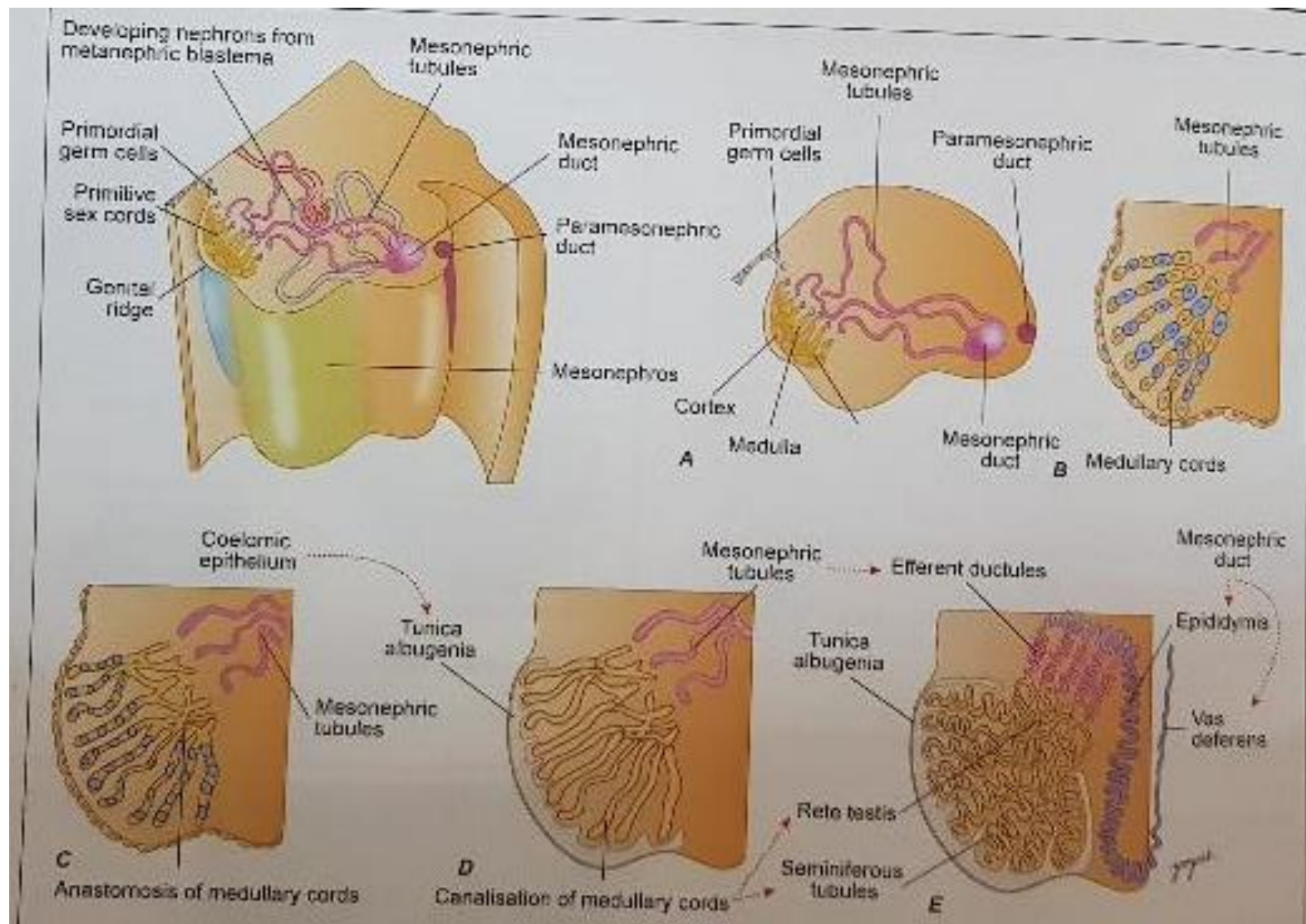
OUTER CORTEX

INNER MEDULLA

OVARY

TESTIS

- Medulla of genital ridge forms seminiferous tubules, rete testis, Interstitial cells, fibrous septa and intrinsic coverings of testis
- Mesonephric tubules form efferent ductules
- Mesonephric duct forms canal of epididymis and vas deferens
- Paramesonephric duct—appendix of testis
- Mesonephros—appendix of epididymis



Development of testis

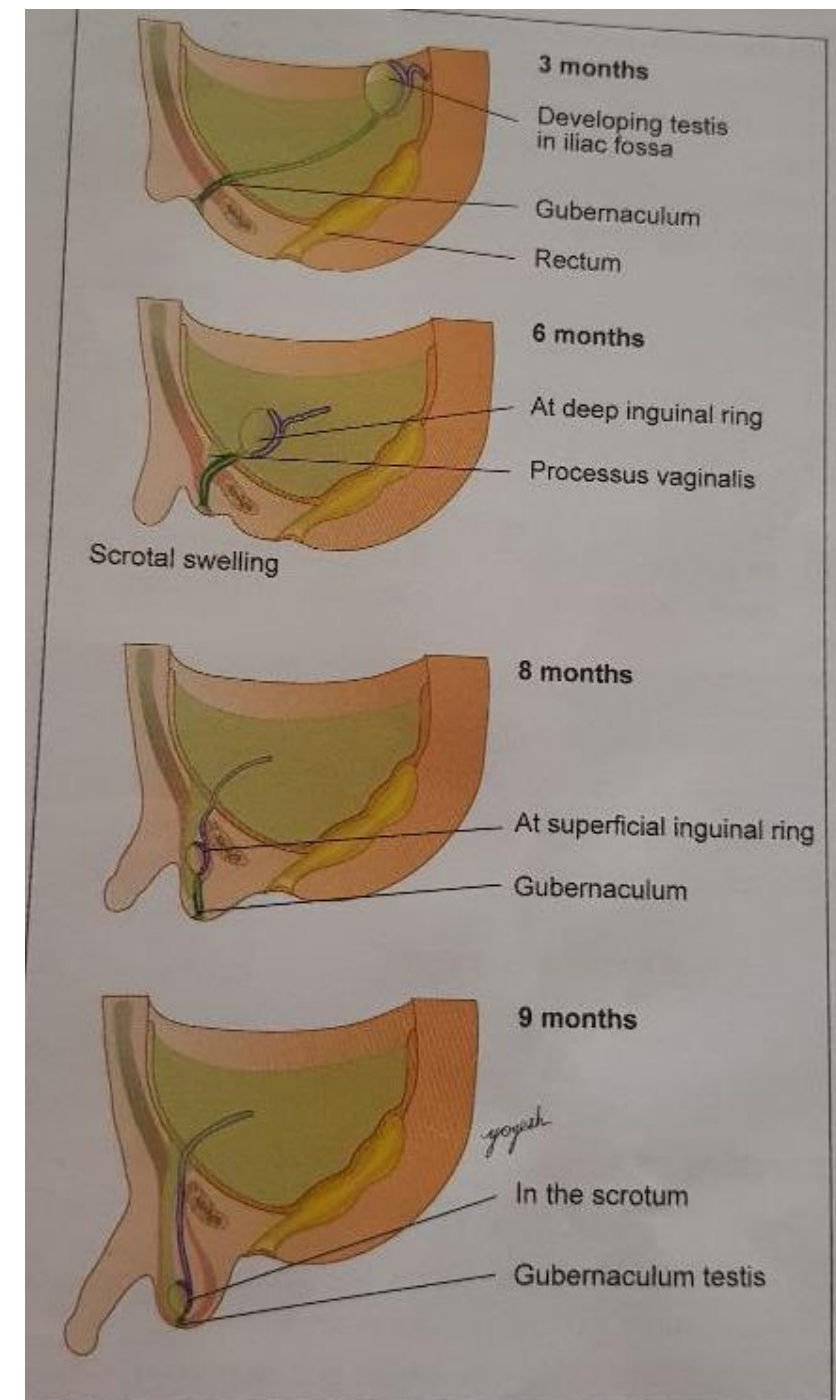
- STAGES OF DEVELOPMENT
- DESCENT OF TESTIS

STAGES OF DEVELOPMENT

- 46,XY-----Y CHROMOSOME-----SRY GENE-----TESTIS
- MEDULLA OF GENITAL RIDGE-----TESTIS
- GENITAL RIDGE-----PRIMITIVE SEX CORDS
 - MEDULLARY CORD NETWORK
 - SEMINIFEROUS TUBULES RETE TESTIS
- PRIMITIVE SEX CORD CELLS-----SERTOLI CELLS
- PRIMORDIAL GERM CELLS-----SPERMATOGONIA

- IN 7th week
- Mesenchymal tissue separates sex cords from coelomic epithelium and forms tunica albugenia, mediastinal septa and interstitial cells of Leydig
- The tubules of rete testis develop communication with adjacent 12-15 mesonephric tubules. These mesonephric tubules form efferent ductules of testis.
- Later mesonephric duct forms Duct of epididymis, vas deferens Seminal vesicles and ejaculatory duct.

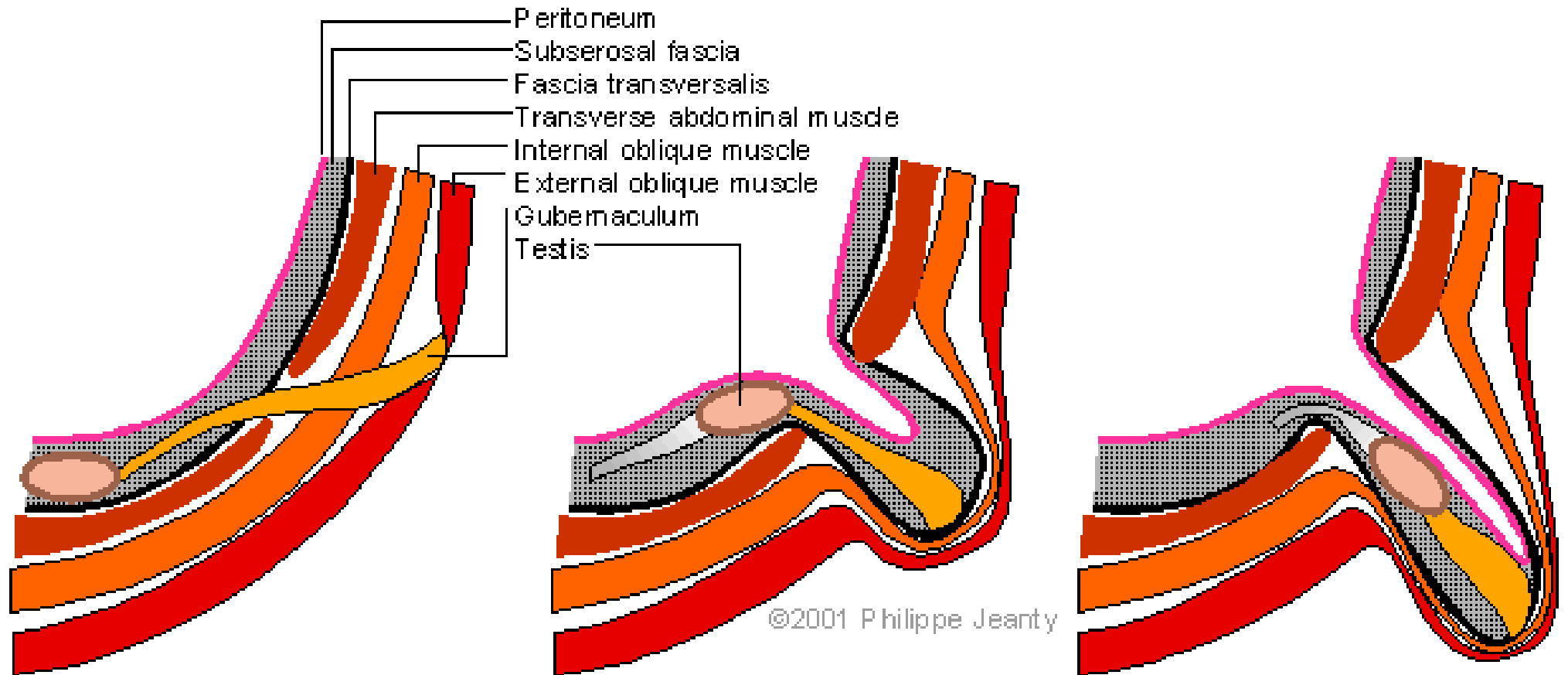
DESCENT OF TESTIS



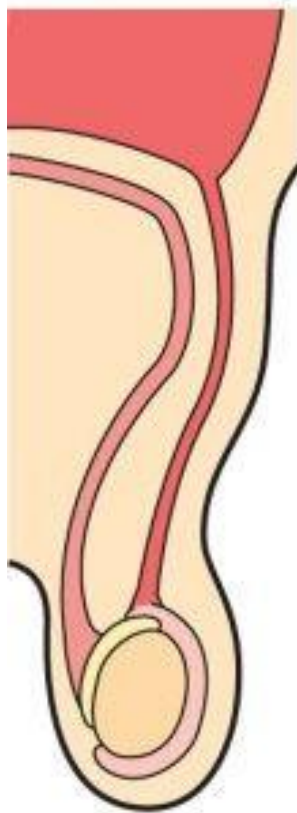
FACTORS RESPONSIBLE FOR DESCENT OF TESTIS

- Differential growth of the body wall.
- Increased intra-abdominal pressure and temperature.
- Formation of inguinal bursa
- Contraction of the gubernaculum (a band of loose fibromuscular tissue extending from the lower pole of the testis to the base of the scrotum).
- Processus vaginalis
- Hormones (male sex hormones produced by the testis, and maternal gonadotrophins).
- Calcitonin gene-related peptide (CGRP), a neurotransmitter secreted by the genitofemoral nerve.

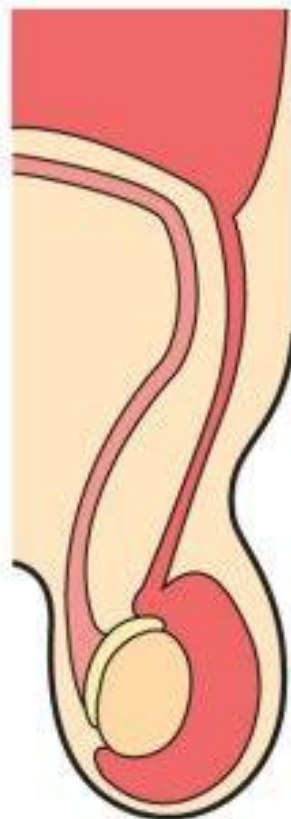
Gubernaculum



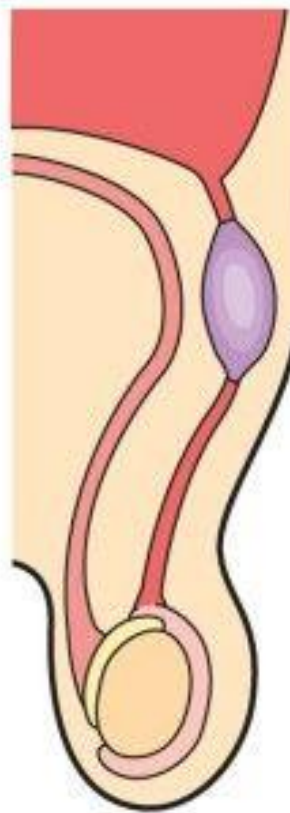
Normal



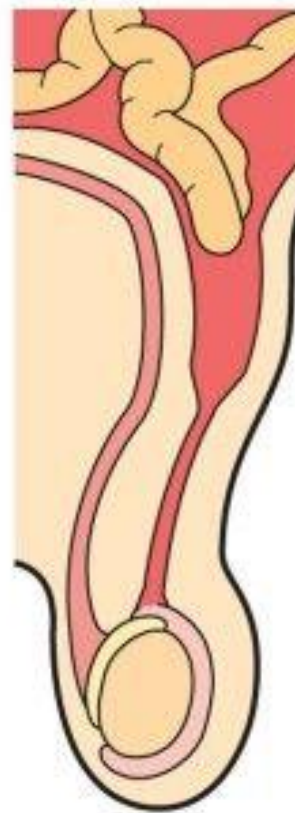
Congenital hydrocele



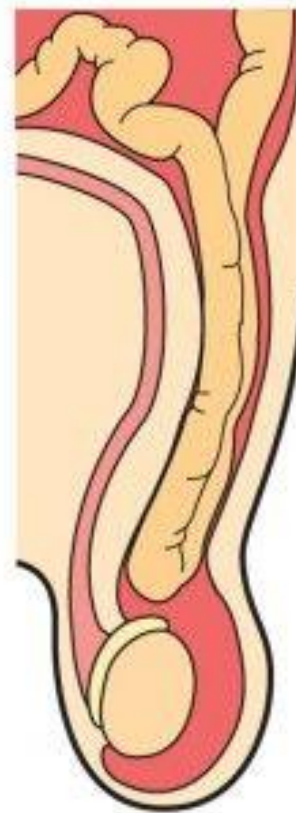
Hydrocele of the cord



Incomplete hernia



Complete hernia



 Spermatic cord

 Obliterated processus vaginalis

Anomalies of testis

- Cryptorchidism

True

Ectopic

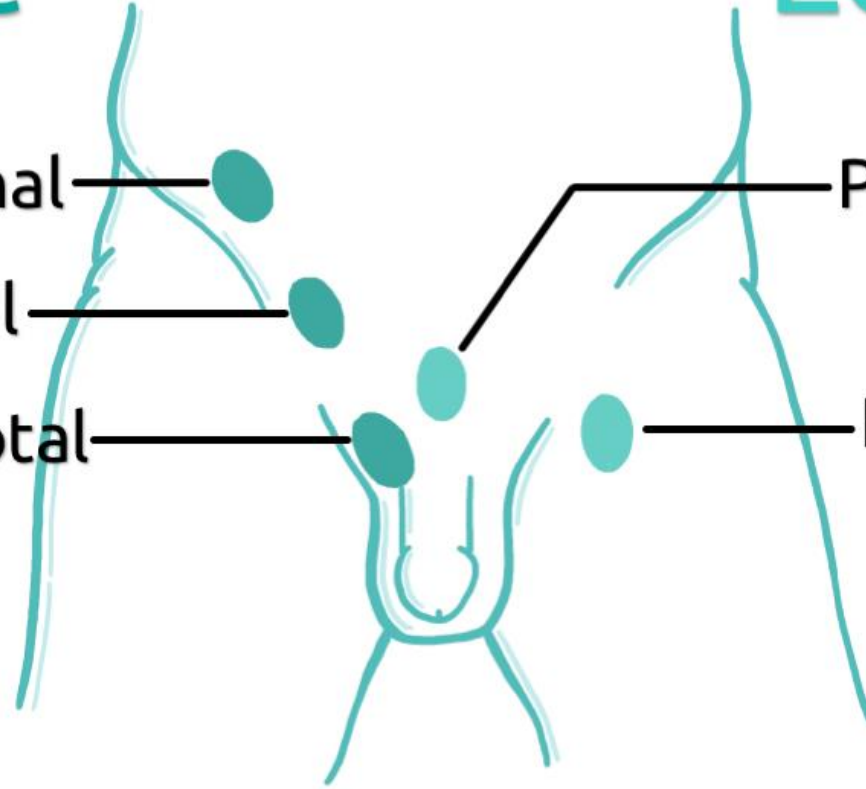
Abdominal

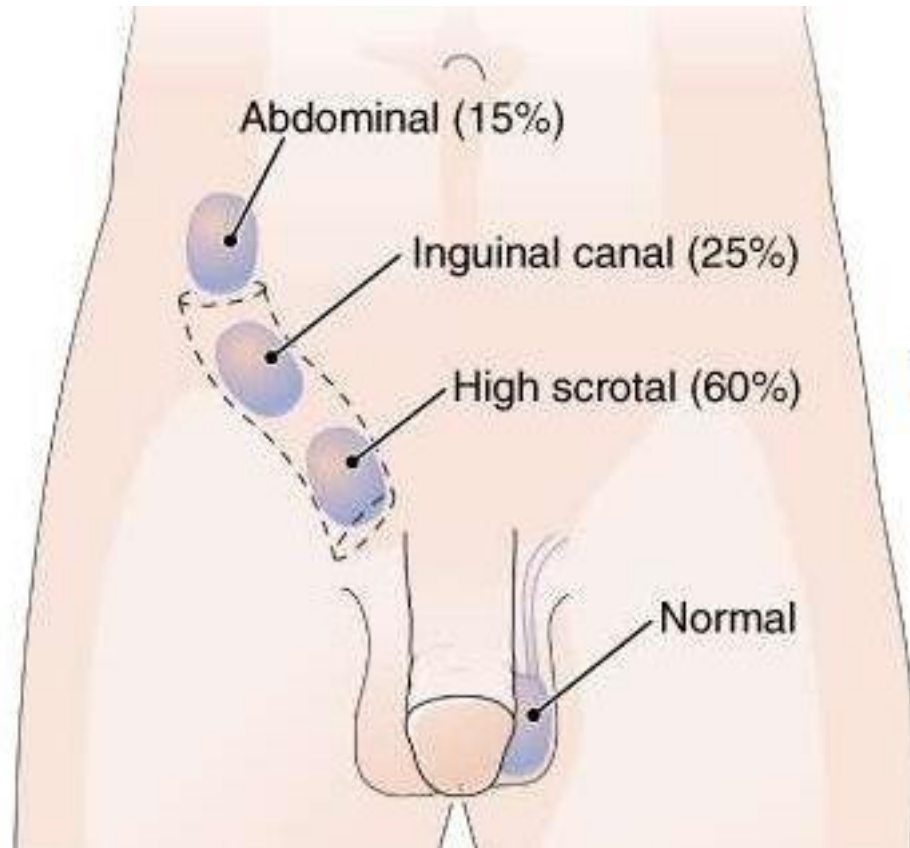
Inguinal

Suprascrotal

Prepenile

Femoral

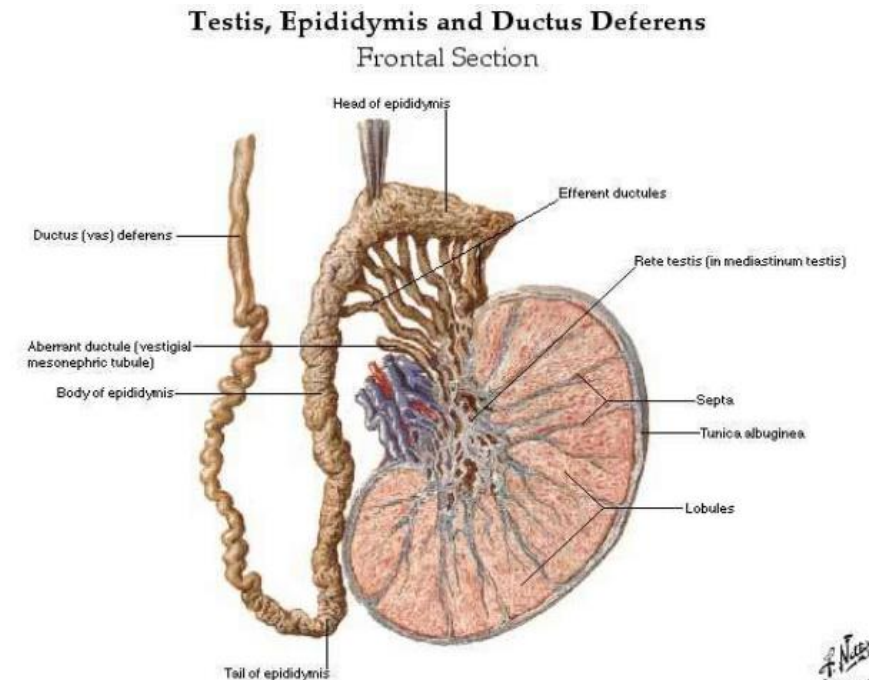




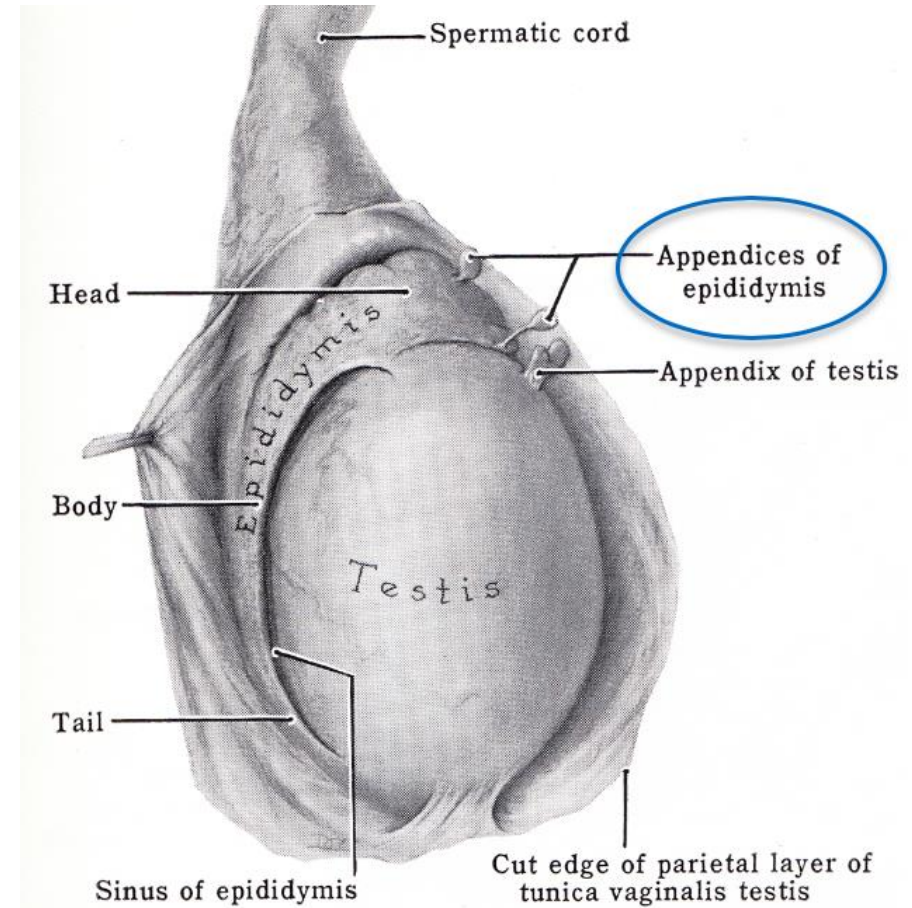
UNDESCENDED TESTICLE

Genital Ducts

- Mesonephric ducts----canal of epididymis, ductus deferens and ejaculatory duct
- Mesonephric tubules-----
- Efferent ductules
- superior aberrant ductules
- Inferior aberrant ductules
- Tubules of paradidymis
- Ductus deferens-----seminal vesicles



- Paramesonephric ducts-----
appendix of testis and prostate
utricle



Prostatic Urethra:

Structures seen on its posterior wall:

Urethral crest:

- A longitudinal elevated ridge.

Prostatic sinus:

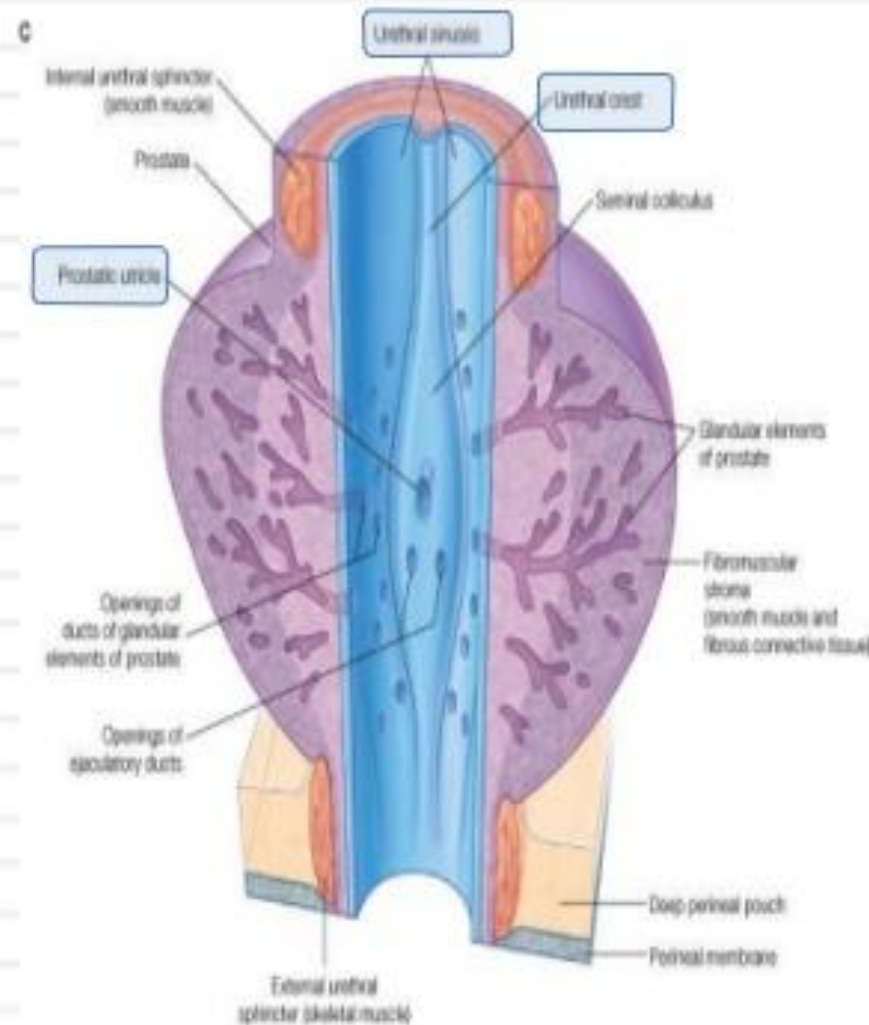
A groove on each side of the crest.

- **The prostatic gland opens into the sinuses.**

Seminal colliculus a rounded eminence that opens into the prostatic utricle.

Prostatic utricle

- A depression on the summit of the urethral crest.
- The ejaculatory ducts open on the sides of the utricle.



Development of prostate

Outer glandular zone

Develops from buds arising
from prostatic
urethra(endodermal in origin)

Inner glandular zone

From buds arising from
mesodermal posterior wall of
urethra above opening of
ejaculatory ducts

Muscle

From surrounding mesoderm
of urethra

THANK YOU