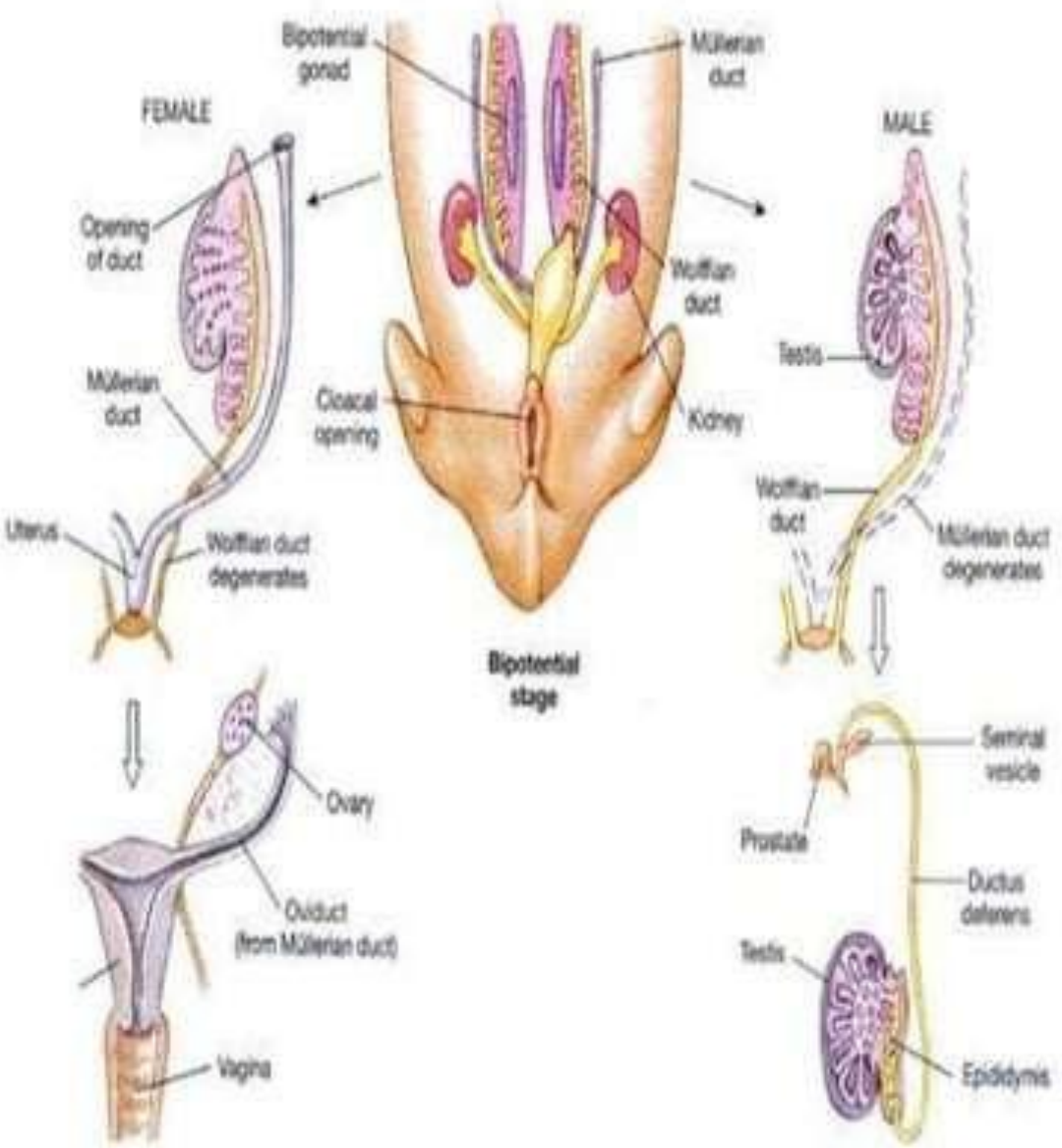
ANATOMY OF MALE AND FEMALE GENITAL SYSTEM

The Reproductive System

- Male and female reproductive systems develop from similar embryonic tissue.
- Adult reproductive systems share some functional similarities.

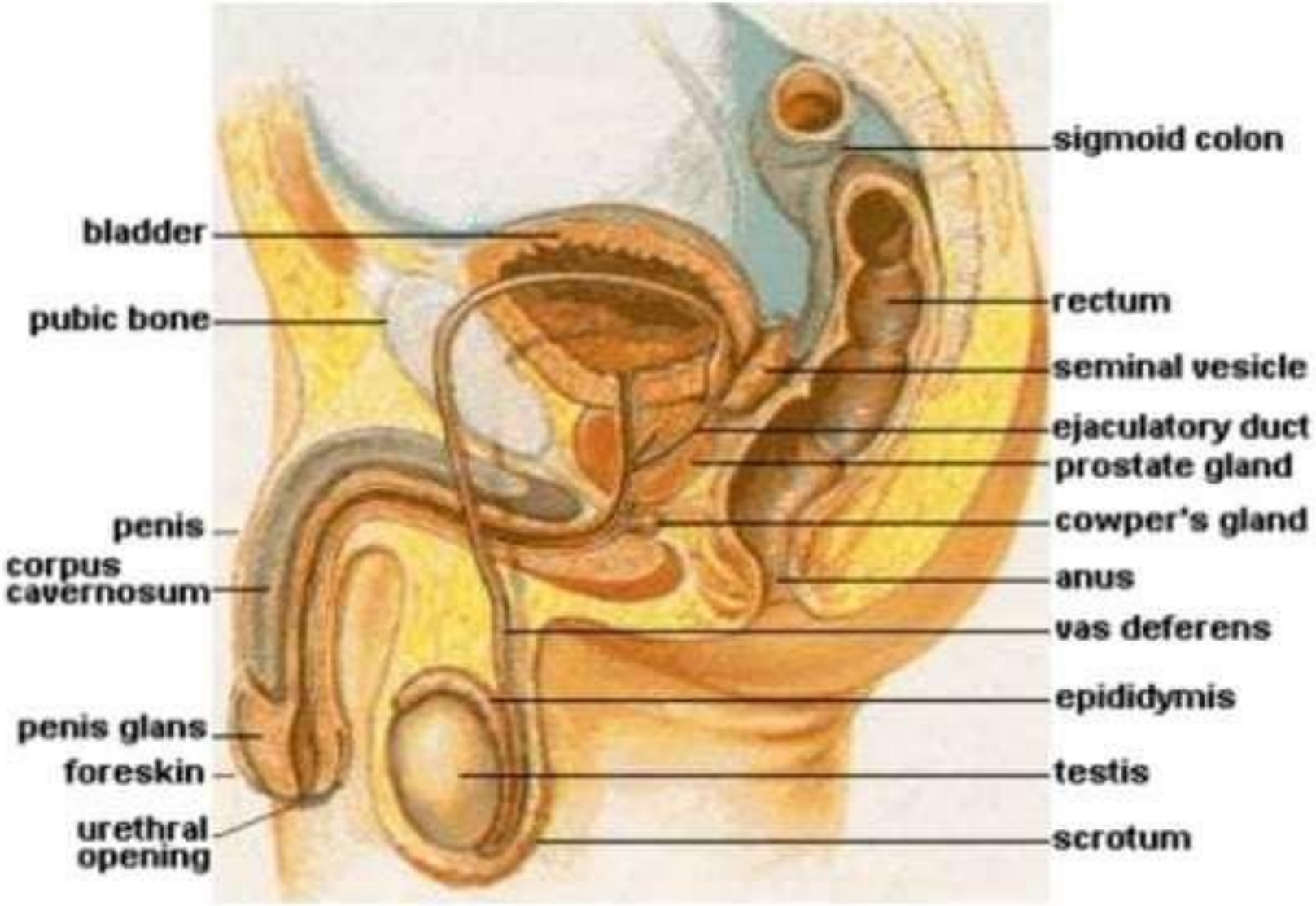


Anatomy of male reproductive system

Male reproductive system

- Composed of prostate gland, penis, urethra, testes, epididymis, scrotum, ductus deferens, ejaculatory ducts, seminal vesicles.
- Main function is the reproduction
- Testes produce sperm and male sex hormones
- Ducts and glands deliver sperm to the female reproductive tract

Male reproductive system



Urethra

. Extends from internal orifice in bladder to external meatus.

18 – 20 cm long , Divided into

(1) Anterior urethra - 16 cm, lies within corpus spongiosum divided into

(a) proximal **bulbar** urethra – widest part surrounded by bulbospongiosus and

(b) distal **penile** urethra – dilated at its termination within glans penis – navicular fossa

External urethral orifice – narrowest part of urethra .

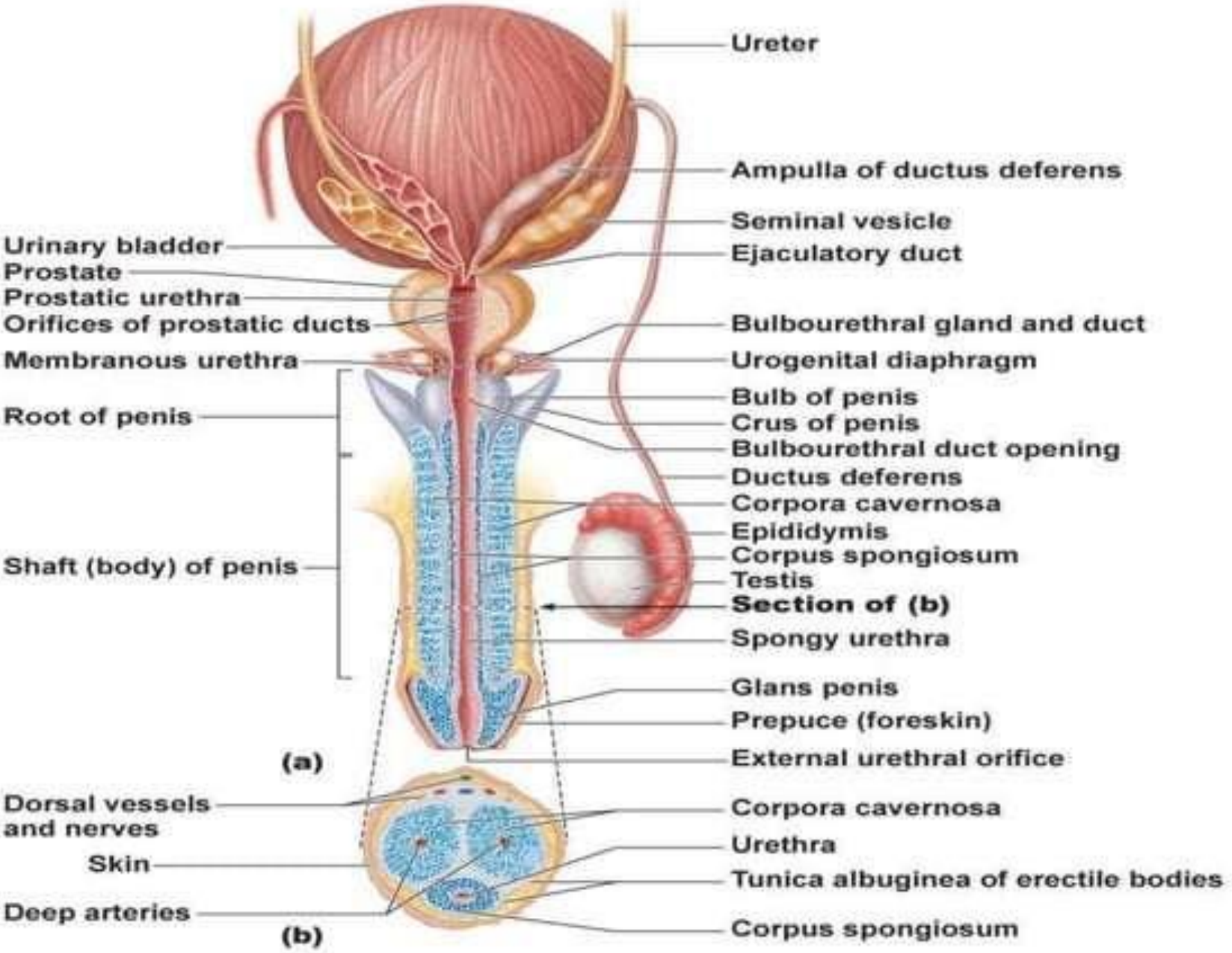
(2) Posterior urethra - 4 cm - divided into (a) **preprostatic** - 1cm ,from base of bladder to prostate

(b)**Prostatic** - 3 to 4 cm , posterior wall has median ridge ,the urethral crest,on each side of crest a depression prostatic sinus which is perforated by 15-20 prostatic ducts . Verumontanum - elevation at middle of urethral crest, on both sides of which openings of ejaculatory ducts

(c) **Membranous** - shortest, least dilatable, from prostate to bulb of penis through perineal membrane

Lymphatic drainage of urethra

- Posterior urethra - Internal iliac nodes , few into external iliac nodes
- Anterior urethra – accompany those of glans penis and end in Deep inguinal node , few into superficial inguinal and external iliac nodes.



Scrotum

- It is cutaneous fibromuscular sac that hangs outside the abdominopelvic cavity at the root of the penis.

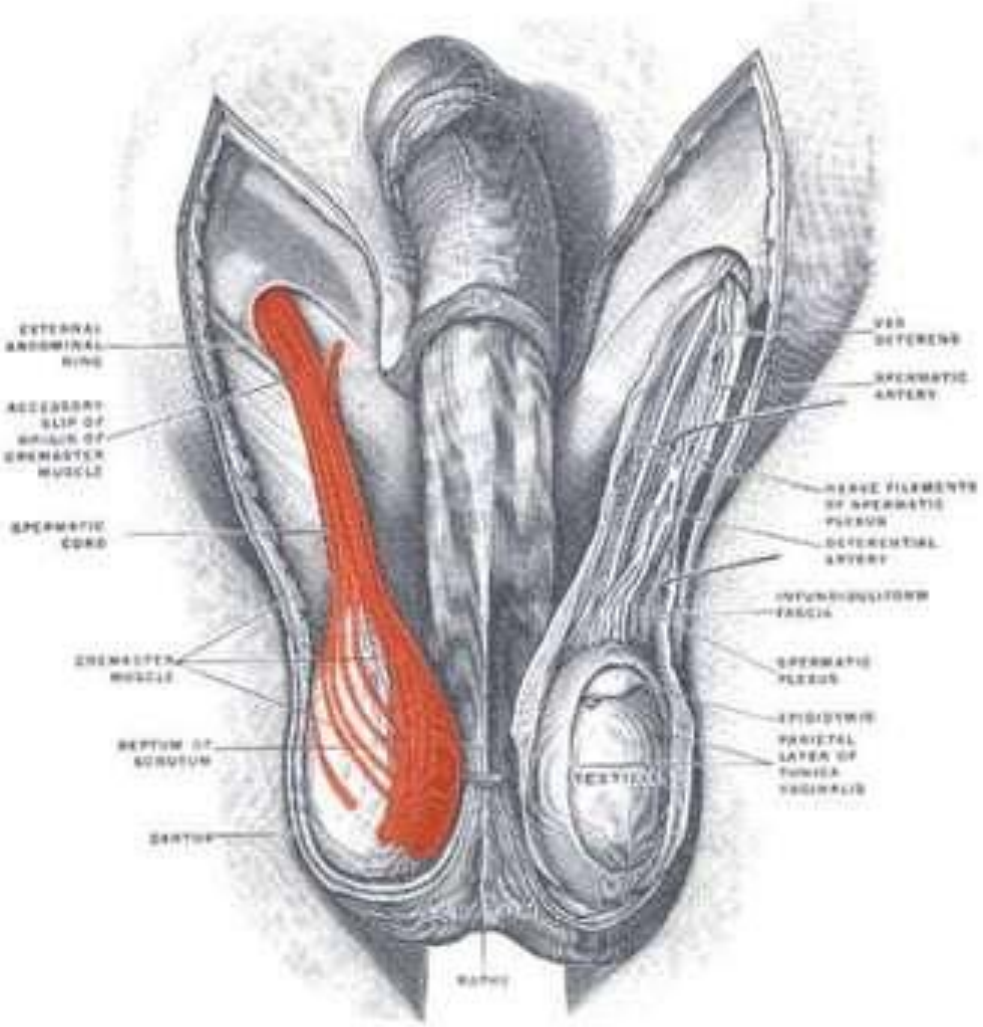
- Consists of skin(thin, pigmented, rugose,thinly scattered hairs, sebaceous glands, no subcutaneous adipose tissue) dartos muscle, external spermatic cremasteric and internal spermatic fascia , testicles separated by a midline septum.

- Lt side of scrotum is usually lower as lt spermatic cord is longer Its external positioning keeps the testes 3°C lower than core body temperature.

- Lymphatics of scrotum drain to Superficial inguinal nodes.

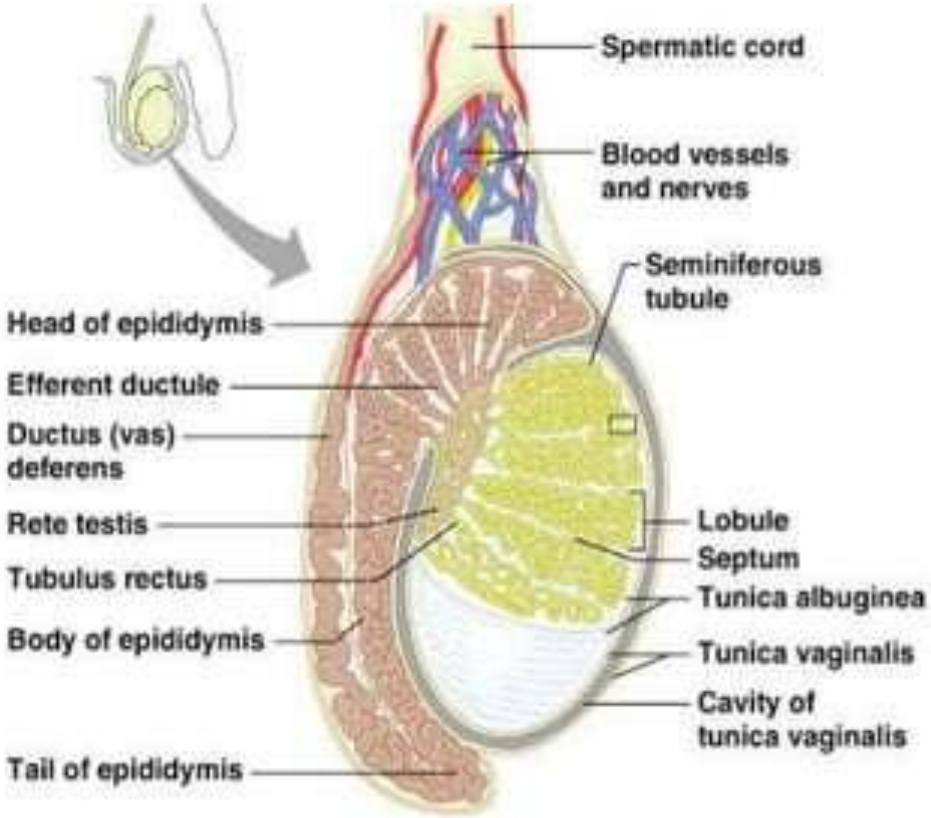
Wall of the Scrotum

- In the dermis, there is a thin layer of smooth muscle known as the **dartos muscle**. Contractions of this muscle causes wrinkling of the skin.
- The **cremaster muscle** is a thicker layer of skeletal muscle that lowers and raises the testes based on temperature.



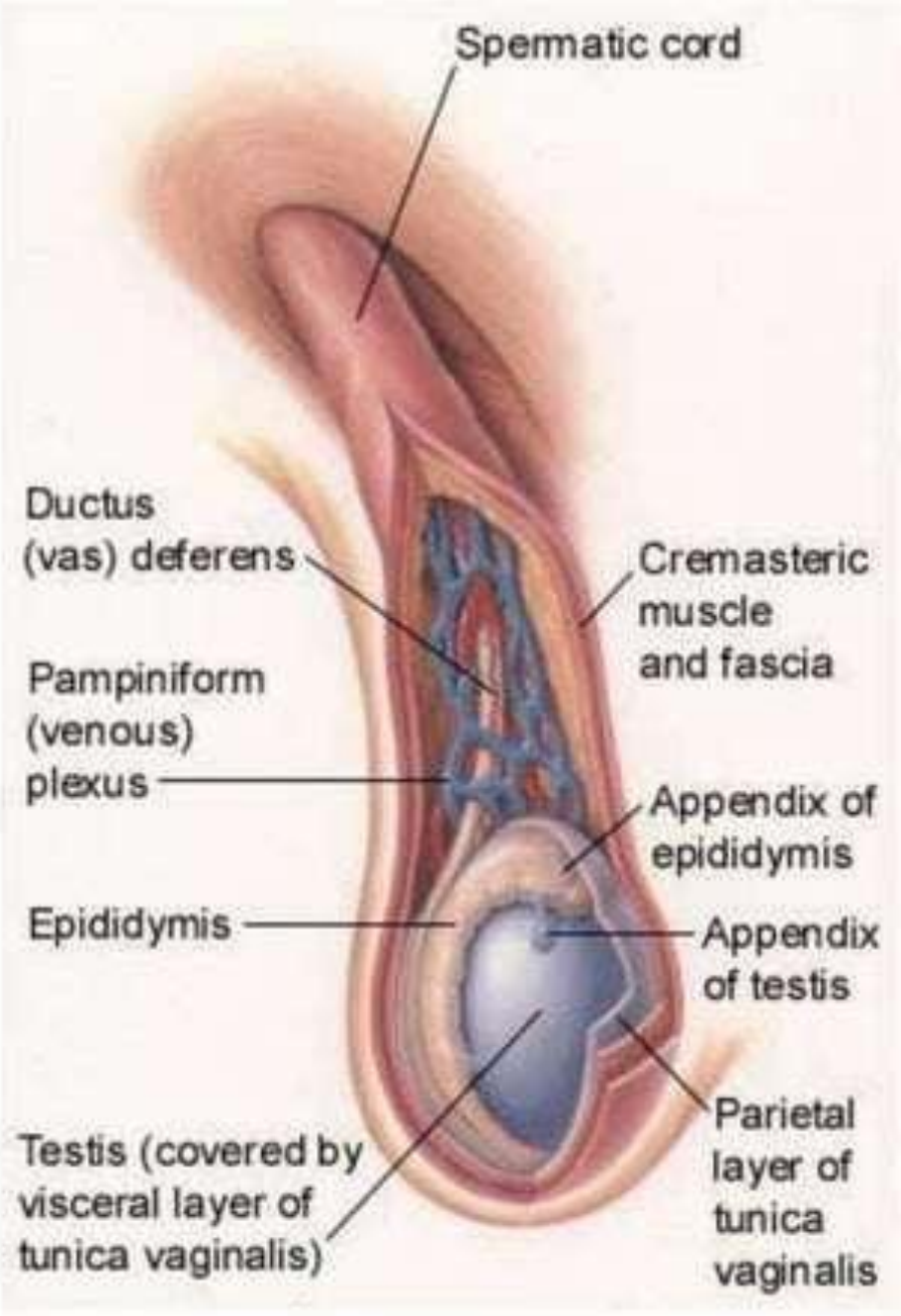
Testes

- Each testes is enclosed by the **tunica vaginalis**, a continuation of the peritoneum that lines the abdominopelvic cavity.
- A fibrous capsule covers each testis called the **tunica albuginea.**
  - The tunica albuginea gives rise to septa (partitions) that divide the testis into lobules (about 250)
  - Each lobule contains 3 or 4 highly coiled **seminiferous tubules**
  - These converge to become **rete testis** which transport sperm to the **epididymis**



Spermatic cord

- Contains the structures running from the testicles to the pelvic cavity.
  - Passes through the inguinal canal
- Contents:
  - Vas Deferens
  - Nerves
  - Blood Vessels



Epididymis

It lies posteriorly and lateral to testes and vas deferens lies along its medial side

Function :Storage and maturation area for sperm

- Its head joins the efferent ductules and caps the superior aspect of the testis
- The duct of the epididymis has stereocilia that:
  - Absorb testicular fluid
  - Pass nutrients to the sperm
- Nonmotile sperm enter, pass through its tubes and become motile (propelled by peristalsis)
- Upon ejaculation the epididymis contracts, expelling sperm into the ductus deferens

Prostate Gland

- Doughnut-shaped gland that encircles part of the urethra inferior to the bladder

Zones – 1. Periurethral zone

2. Central zone

3. Peripheral zone

- Prostatic secretions- 30% of ejaculate volume . pH is 7 plays a role in protecting against urinary tract infection

  - Enters the prostatic urethra during ejaculation

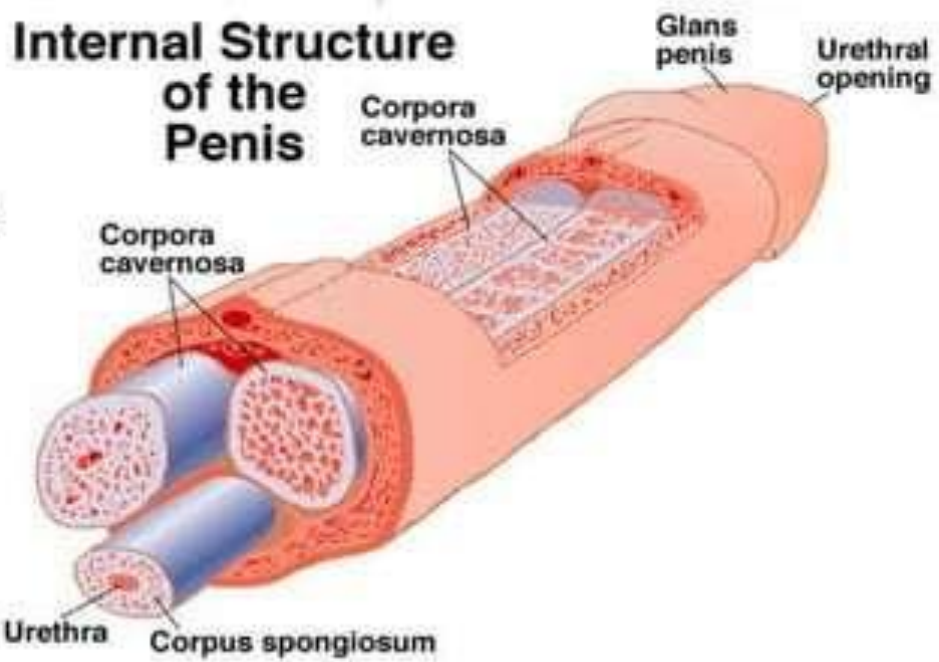
Penis

Consists of attached root(radix)in perineum and free pendulous body (corpus) enveloped in skin.

Skin - thin, loosely connected to tunica albuginea, At corona of penis folded to form prepuce.

Root- two crura (post parts of corpora cavernosa) and one bulb (post end of corpus spongiosum.

Body – Consists of rt and lt corpora cavernosa and median corpus spiongiosum(at tip expands to form glans)



Lymphatics

- **Penile and perineal skin** –Superficial inguinal nodes
- **Glans** – Deep inguinal and External iliac nodes
- **Erectile tissue and penile urethra** – Internal iliac nodes

Accessary Glands – **Seminal vesicles**

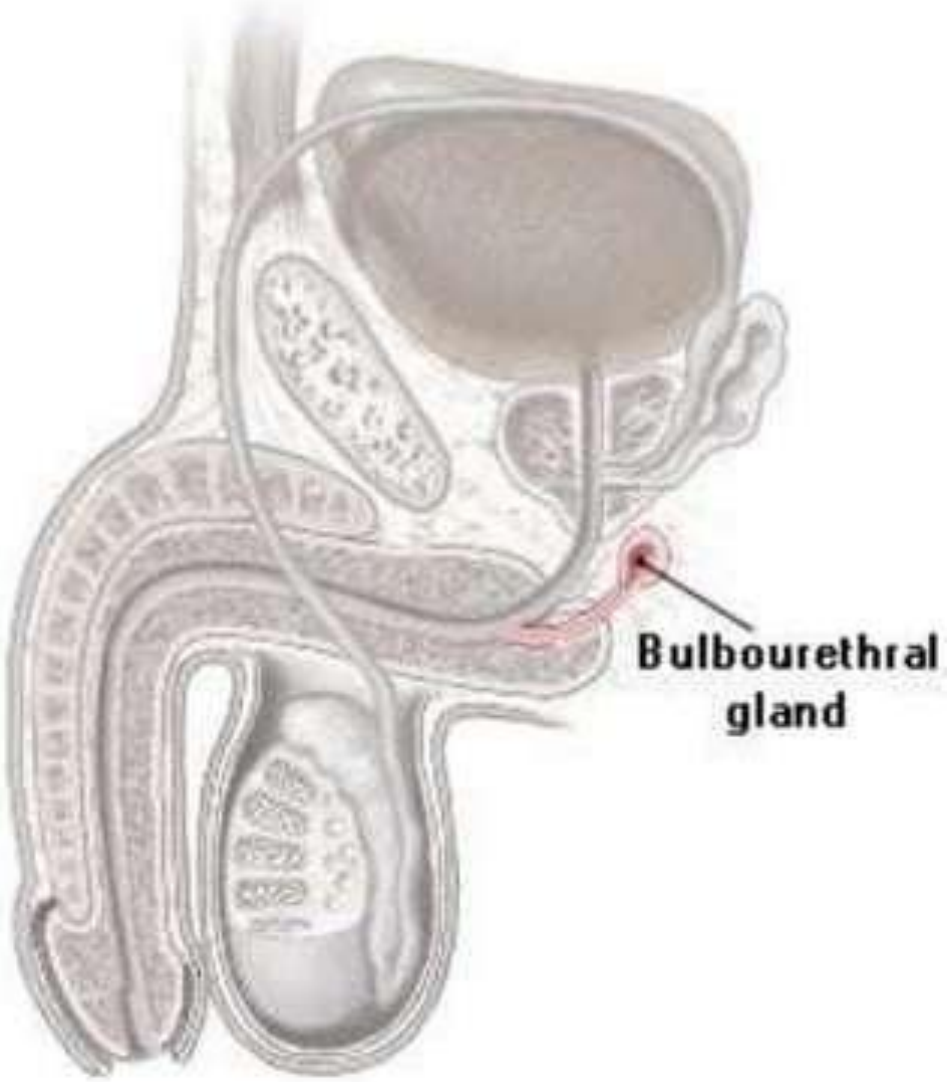
Lie on the posterior wall of the bladder and secrete 60-70 % of the volume of semen

- Seminal fluid: -alkline , yellowish viscid fluid
  - **Fructose**: provides energy for the sperm.
  - Fibrinogen: helps turn semen into a bolus that can be readily propelled into the vagina.
  - Prostaglandins: decrease cervical mucus viscosity and stimulate reverse peristalsis of the uterus.

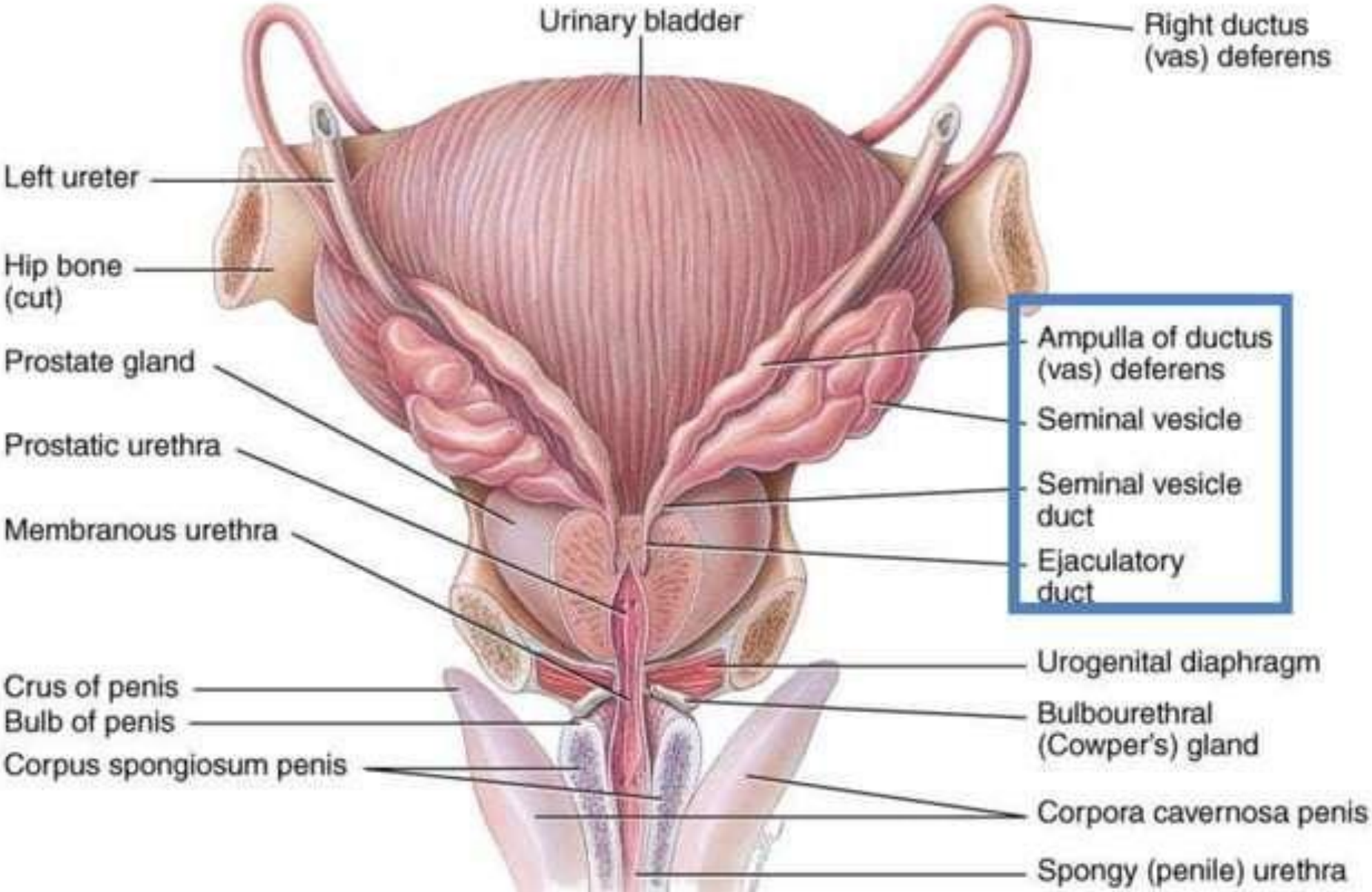
- Upper pole is cul-de-sac and lower pole narrows to a straight duct which joins the ductus deferens to form the ejaculatory duct

Bulbourethral Glands (Cowper's Glands)

- Paired Pea-sized glands inferior to the prostate
- Excretory ducts drain into post. urethra
- Produce thin, alkaline mucus prior to ejaculation that neutralizes traces of acidic urine in the urethra



Posterior Bladder



Anatomy of female reproductive system

Female reproductive system

- composed of mammary glands, ovaries, uterine tubes, uterus, and vagina
- Main function is the production of offspring
- Ovaries produce eggs and female sex hormones
- Remaining structures serve as sites for fertilization and development of the fetus
- Mammary glands produce milk to nourish the newborn

Female genital tract is divided into

1.lower genital tract (vulva and vagina)

2.upper genital tract (uterus,cervix,fallopian tubes,and ovaries)

Lower genital tract

1.Mons pubis- hair bearing area of skin over pubic symphysis.
2.Labia majora- longitudinal folds of skin from mons pubis to perineum.
3.Labia minora- cutaneous folds devoid of fat that lie between the labia minora.
3.Vestibule- cavity between labia minora , contains vaginal and external urethral orifices and openings of two Bartholins glands.
4 Urethra- 4 cm long , 6mm in diameter, opens into vestibule 2.5 cm below clitoris.
Ducts of paraurethral (Skene's glands)open on each side of lateral margin of urethra

Greater vestibular gland (Bartholin'glands)

- Homologues of male bulbourethral glands
- Two small round or oval , reddish yellow bodies that flank the vaginal orifices, each opens into posterolateral part of vestibule by a 2 cm duct
- Gland secrete a clear or whitish mucus with lubricant properties

Clitoris

- Homologues of penis, has root, body, glans. It is enclosed by bifurcated ends of labia minora.

Vagina

Fibromuscular tube extending from vestibule to the uterus.

Upper end of vagina surrounds the vaginal projection of the uterine cervix

Vagina opens externally via a sagittal introitus below urethral meatus.

Hymen is thin fold of mucous membrane situated just within the vaginal orifice.

Vaginal mucosa - thick membrane lined by non keratinized stratified squamous epithelium with high glycogen content.

The action of Doderline bacilli on this glycogen produce lactic acid, which is responsible for acidity of vaginal secretions .

Lymphatic drainage

- **Vulva**

-Mons pubis : Superficial inguinal nodes which drain to Deep inguinal nodes through cribriform fascia, which drain via femoral canal to Pelvic nodes

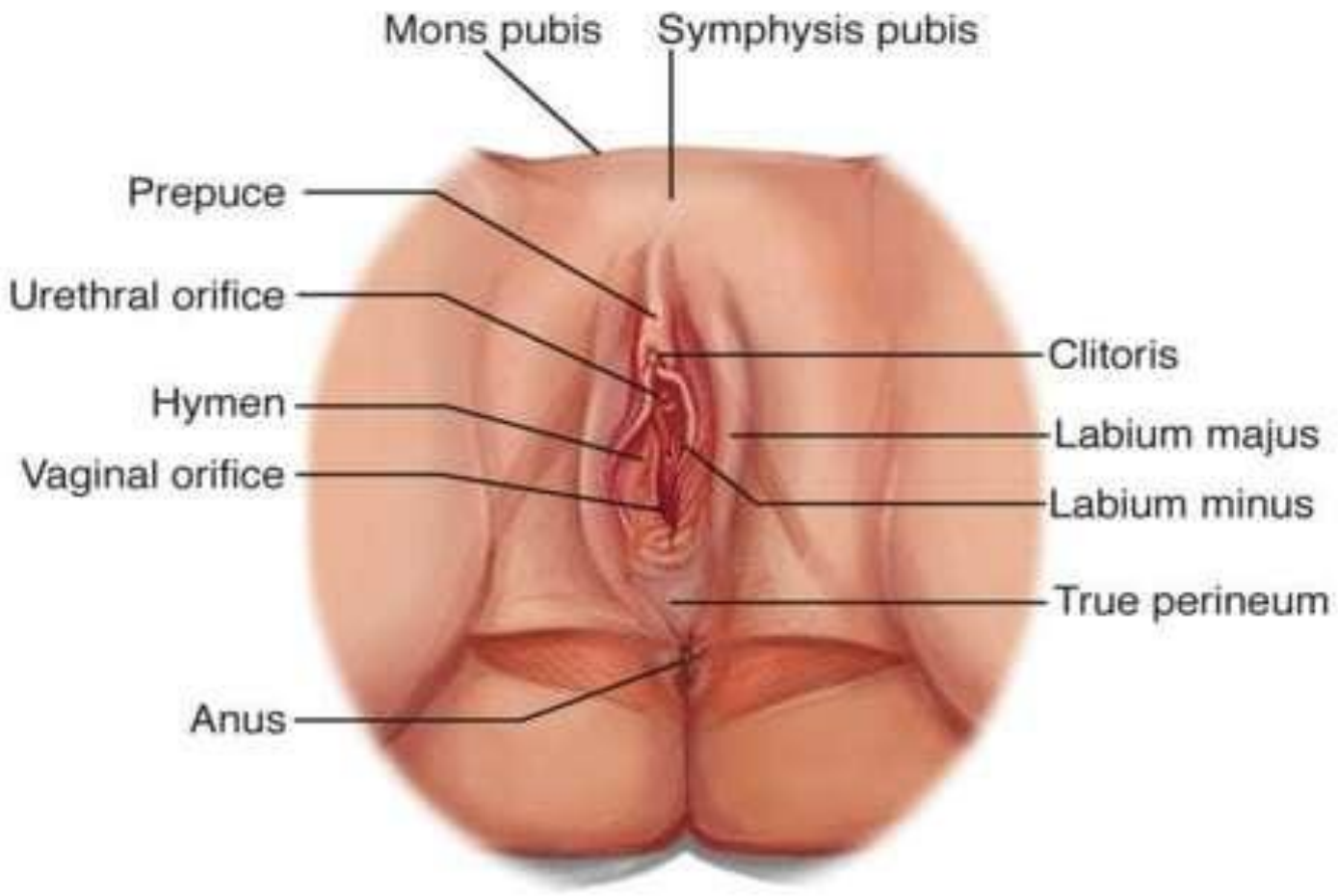
-Perineum and lower part of labia majora drain to Rectal lymphatic plexus

-Clitoris and labia minora drain to deep inguinal nodes.

. **Vagina**

1) Upper 1/3 rd – accompany uterine artey to Internal and External iliac nodes
2) Mid 1/3 rd – accompany vaginal artery to Internal iliac nodes
3) Lower 1/3 rd draining vagina below hymen, from vulva and perineal skin to Superficial inguinal nodes.

Female reproductive system

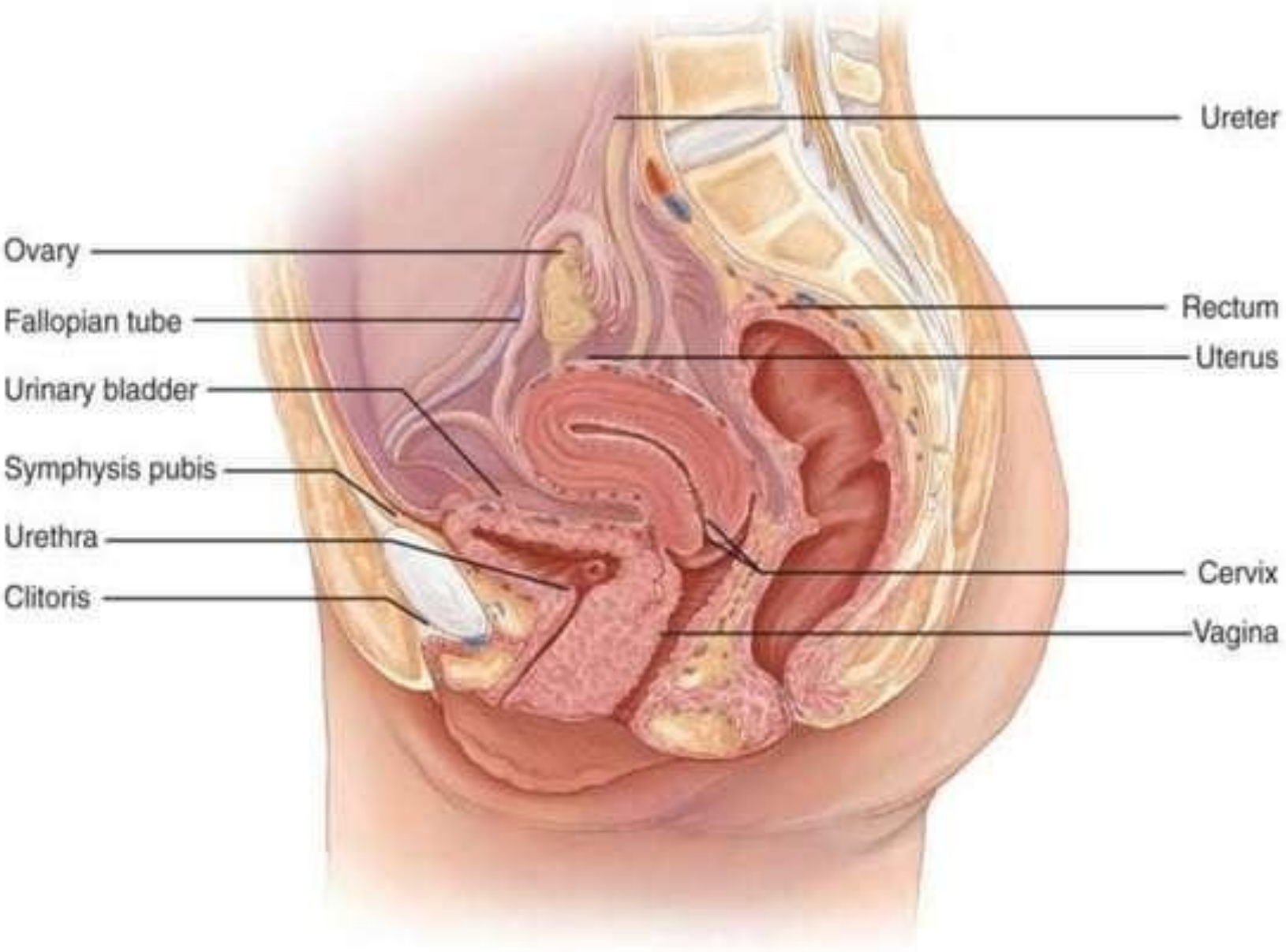


Ovary

- Paired, situated on either side of uterus
- Close to lateral pelvic wall
- In *ovarian fossa of Waldeyer*
- Size: 4x3x2 cm
- *Only intra-abdominal structure not covered by peritoneum*
- Medial pole: attached to uterine cornua by ovarian ligament
- Laterally to the pelvic wall by infundibulopelvic ligament
- Fimbrial end of oviduct close to ovary & attached to it via *fimbria ovarica*
- **Lymphatics**
    - Para-aortic nodes

Fallopian tubes

- 10-14 cm
- Lies within the superior border of broad ligament
- 2 openings
  - Medially into cornua
  - Laterally into abdominal cavity
- Lymphatics
  - Para-aortic nodes


Ureter
Ovary
Rectum
Fallopian tube
Uterus
Urinary bladder
Symphysis pubis
Urethra
Cervix
Clitoris
Vagina

Uterus

- Hollow, pyriform muscular organ in pelvis
- Position: anteversion & anteflexion
  - ➢ uterus dextrorotated
  - ➢ cervix levorotated
- Measurements - 7.5cm long, 5cm wide, 3cm thick
  - – Weight : 50-80gm

Parts

1)**Body**- Fundus : 1.5 cm

Body proper: 3.5 cm

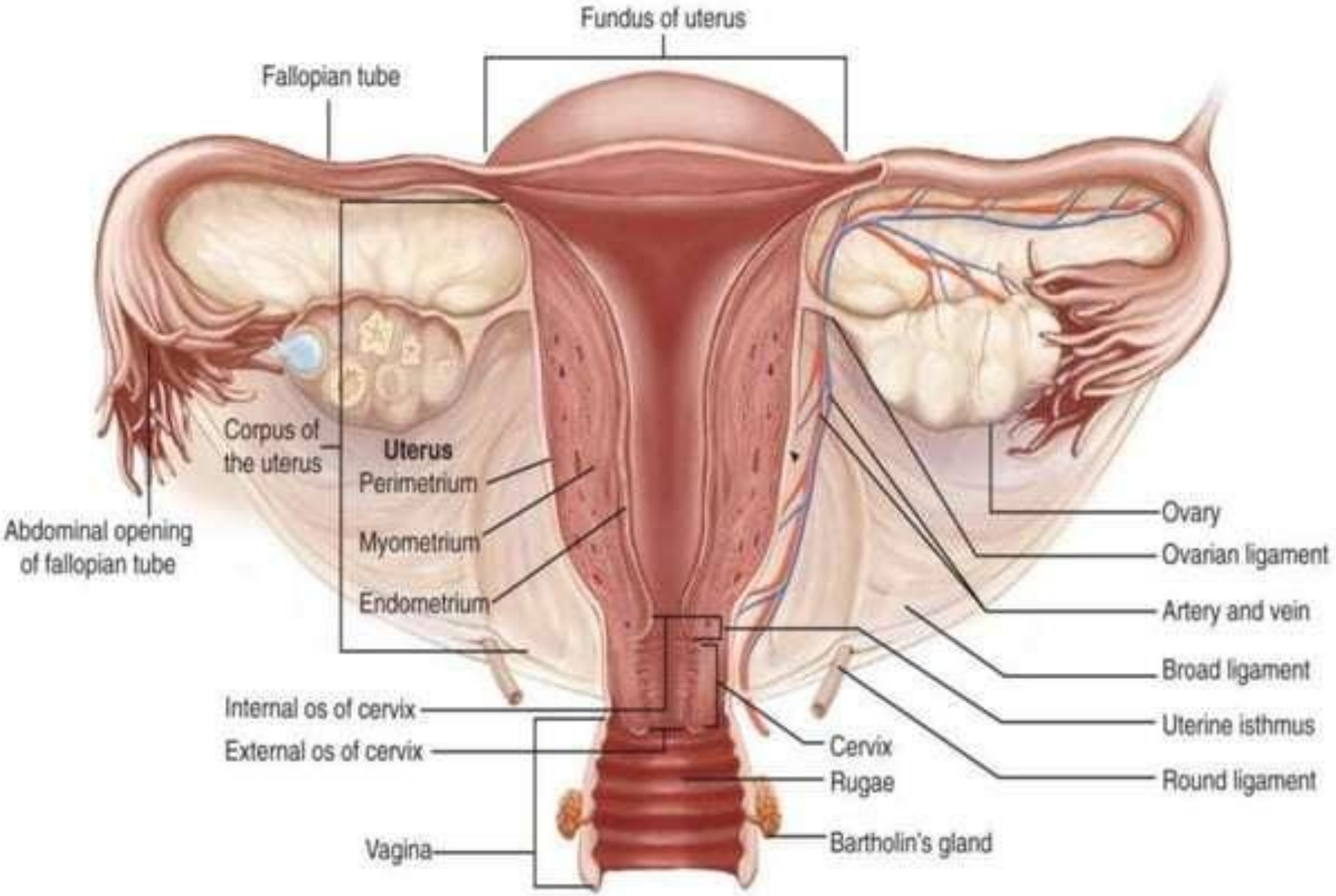
2)**Isthmus**- 0.5 cm, Between anatomical & histological internal os (of Aschoff)

3)**Cervix**- 2.5cm , Supravaginal & infravaginal (portio vaginalis) parts

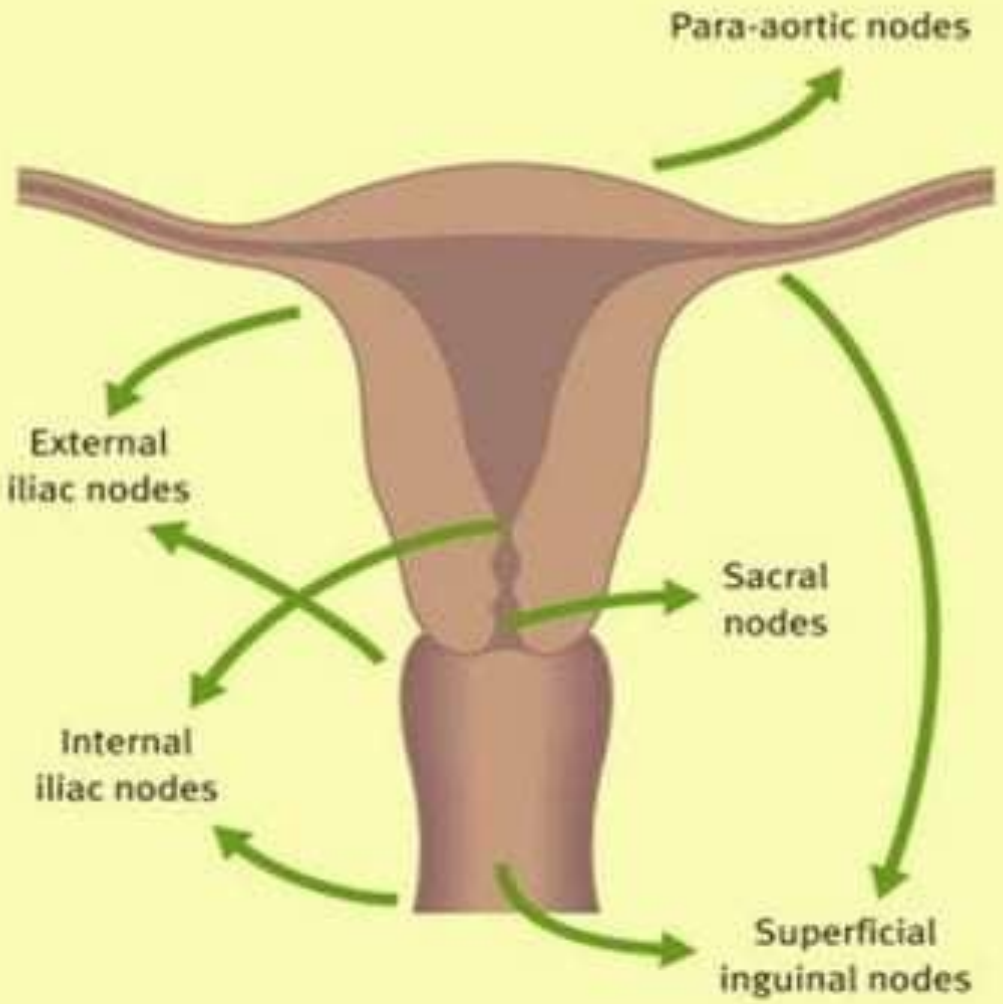
-Cervical canal

-External os

-Secretion: alkaline & thick, rich in fructose, NaCl, & mucoprotein


Fundus of uterus
Fallopian tube
Corpus of the uterus
Uterus
Perimetrium
Myometrium
Endometrium
Abdominal opening of fallopian tube
Ovary
Ovarian ligament
Artery and vein
Broad ligament
Uterine isthmus
Round ligament
Internal os of cervix
External os of cervix
Cervix
Rugae
Bartholin's gland
Vagina

Lymphatic drainage of the uterus and vagina



THANK YOU