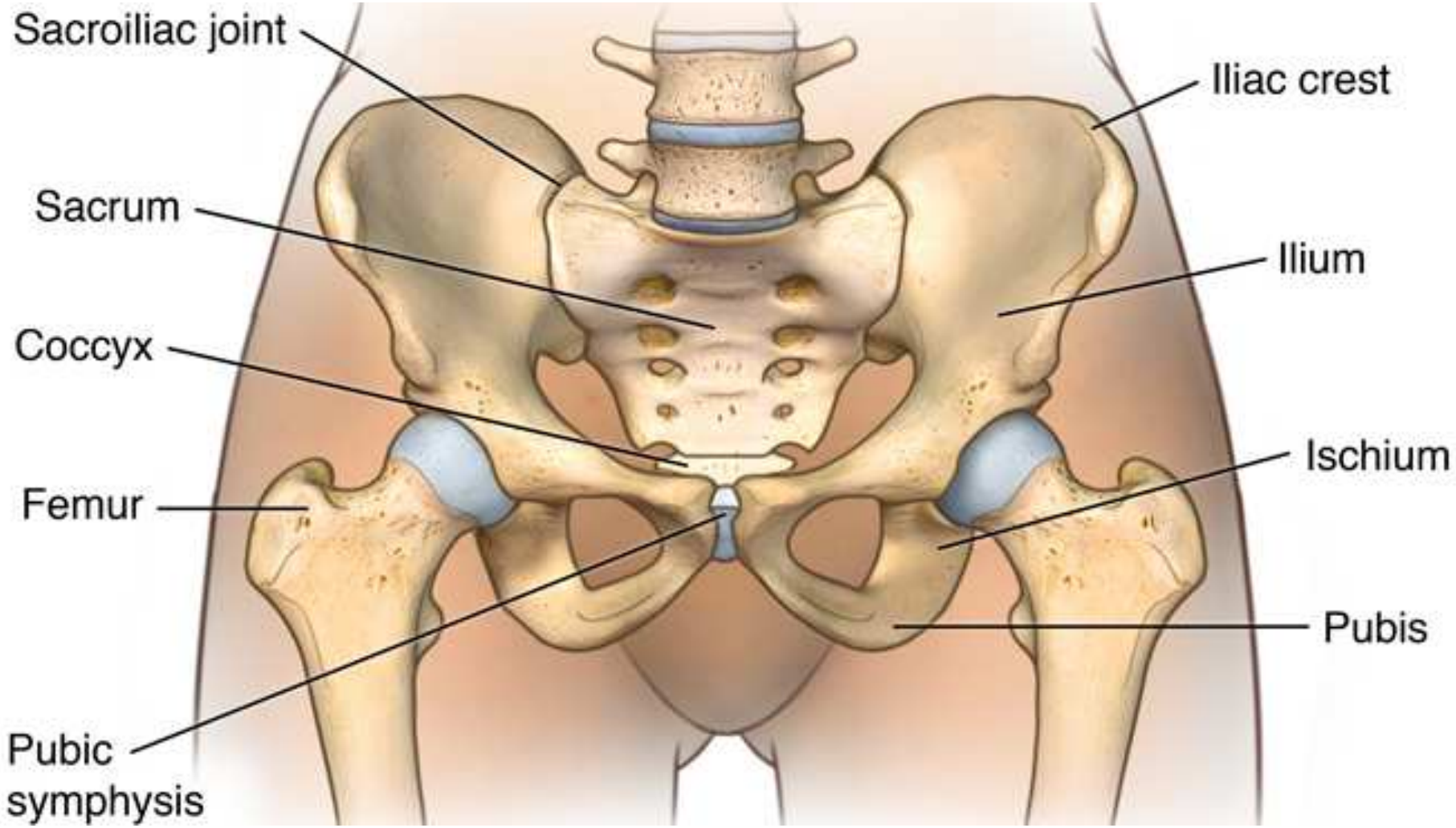
Surgical Anatomy of Female Pelvis: An Overview

Dr A M Tarnekar
Professor (Anatomy)
MGIMS Sevagram

Pelvis

- Walls
- Contents
- Vascular supply & lymphatic drainage
- Sp. Features of female pelvis
- Structural details of selected viscera

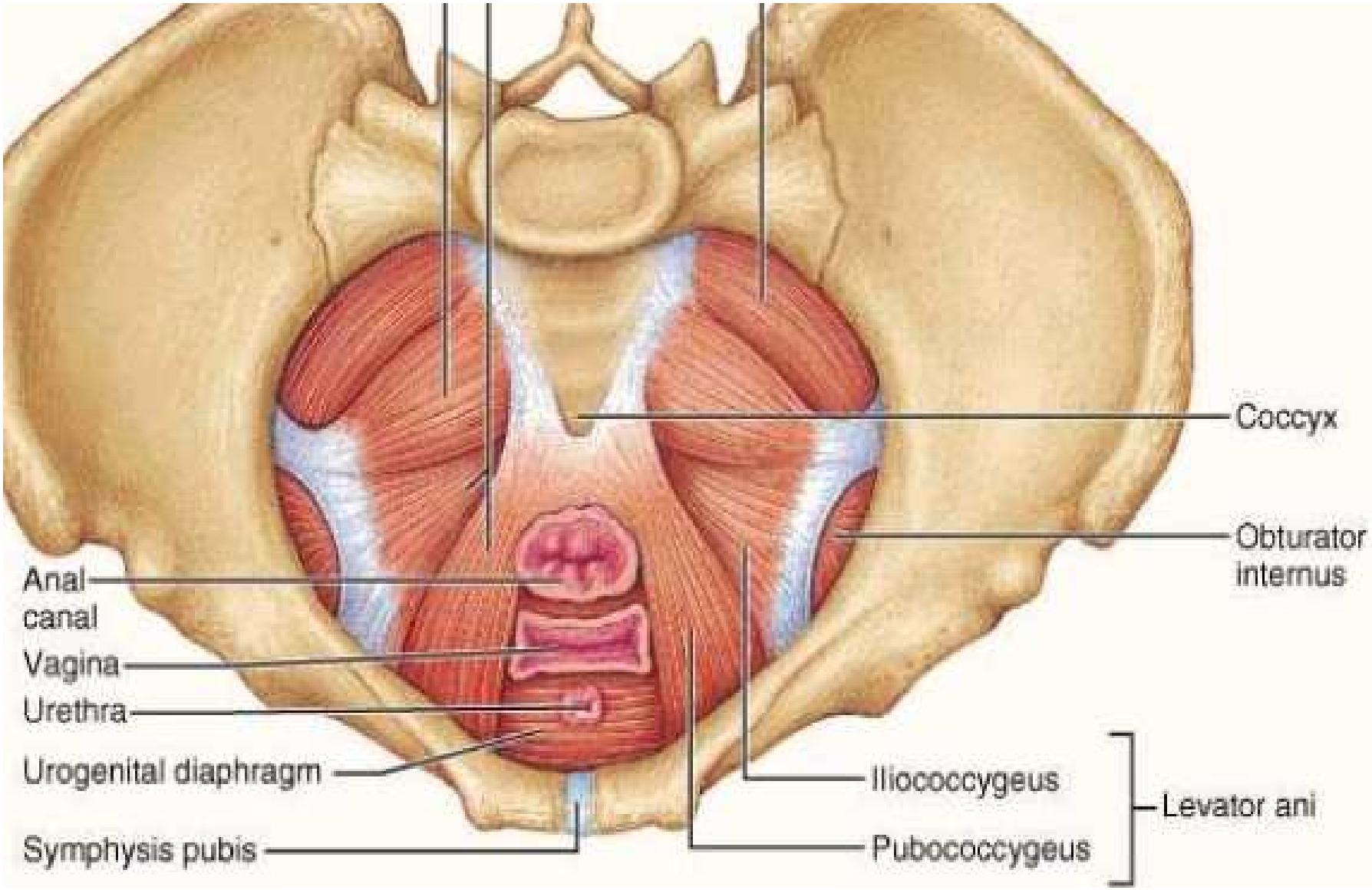
Bony pelvis- Female



Wall of Pelvis

- Long bony posterior wall
  - Sacrum & coccyx
  - Sacrotuberous lig & sacrospinous lig.
  - Piriformis muscle with sacral plexus

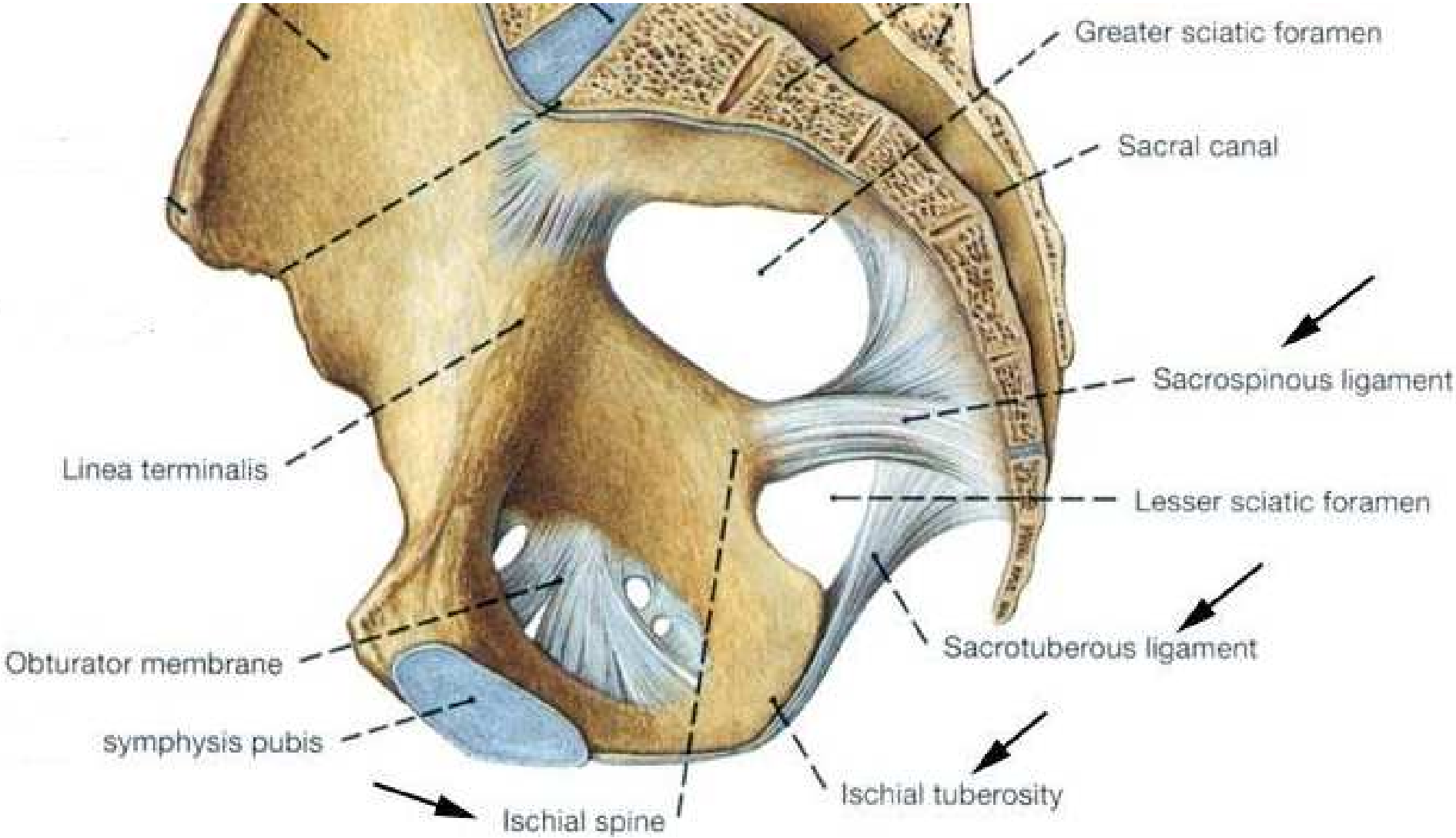
Muscles of Pelvic floor & posterior wall



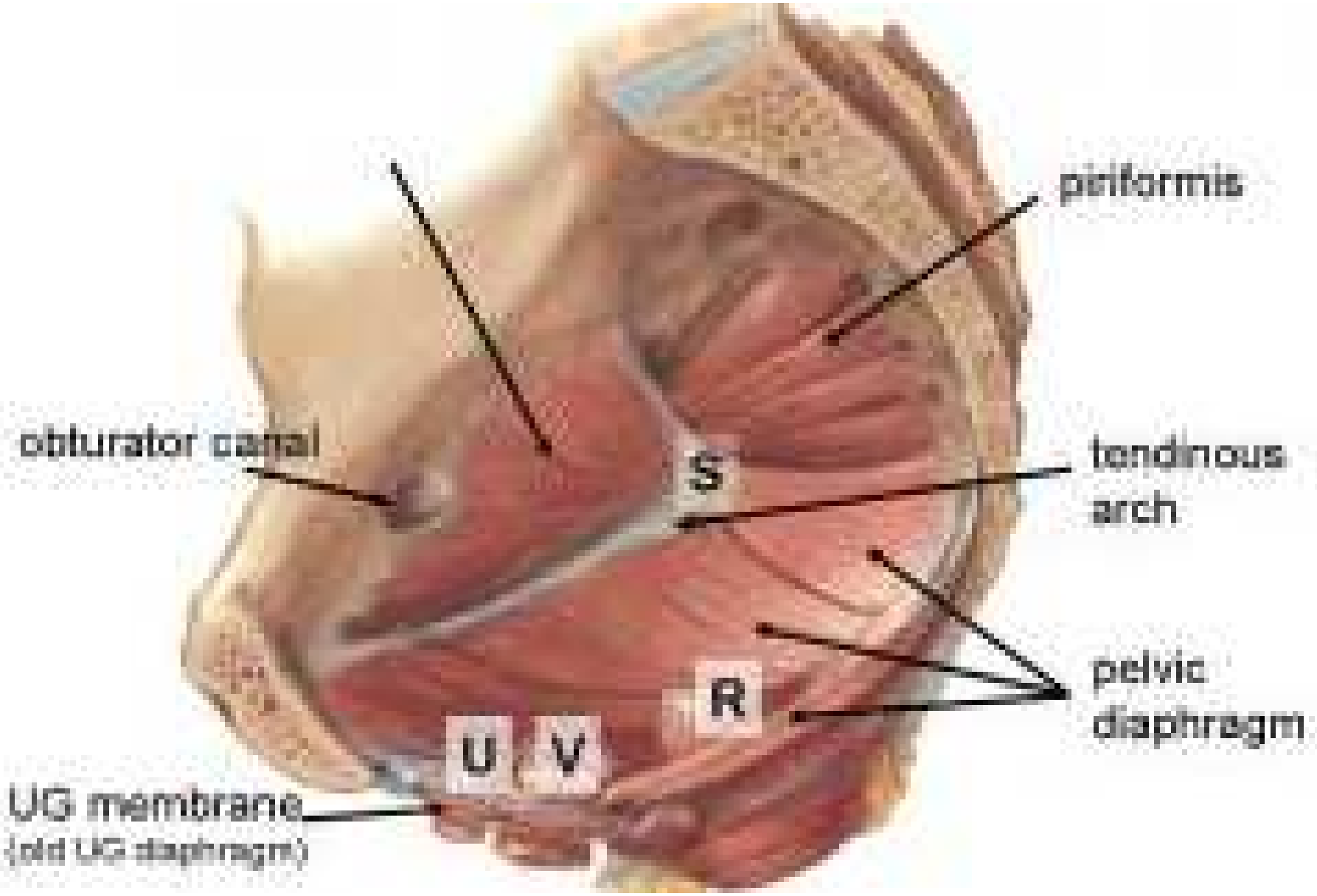
Lateral walls of pelvis

- Obturator internus and covering fascia; arcus tendineus for attachmment of levator ani
- Ischial tuberosity, spine & conjoint ischio-pubic rami
- Obturator foramen, membrane; greater & lesser sciatic foramina
- Internal iliac vessels, ureter, nerves

Side wall of pelvis



Pelvic Musculature: view from interior



Anterior wall of Pelvis

- Shorter as compared to other walls
- Bodies of Pubis & pubic symphysis
- This wall is at much lower level as compared to Posterior wall
- So inlet of the pelvis is tilted & directed little downwards and forwards
- Lower limit of the anterior wall is below the lower limit of posterior wall but above the two ischial tuberosities (lateral wall)

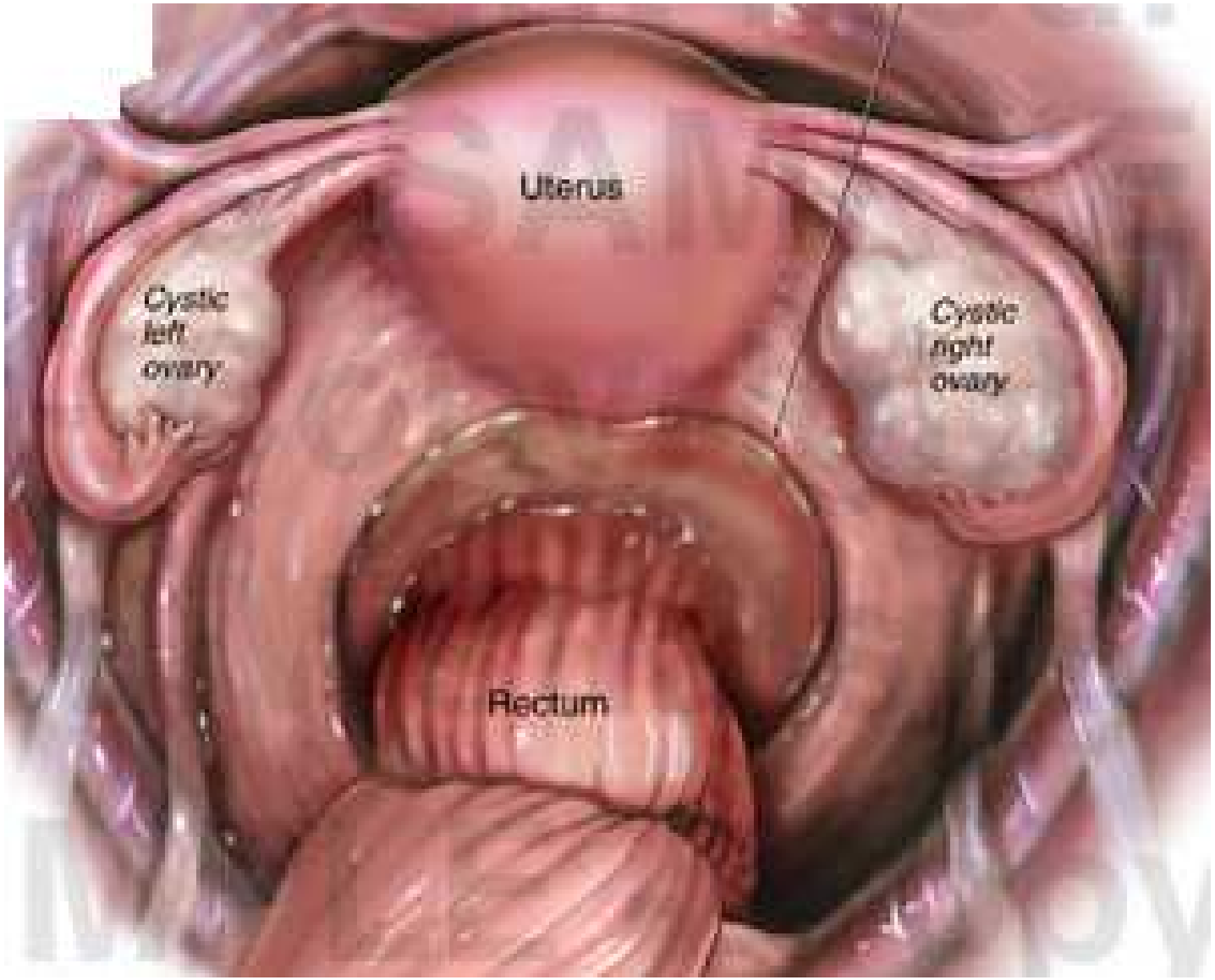
Two slopes at the pelvic floor

- Due to difference in ratio of pelvic walls, two triangular intervals exist at floor, covered by muscles
- Urogenital Δ is in front, sloping downward & forward & anal Δ behind, sloping downward & backward; base of both triangles is shared at a line drawn between two ischial tuberosities
- Urogenital diaphragm covers the urogenital Δ and pelvic diaphragm covers anal Δ
- Perineal body, lying in the middle of two Δs, provides attachments to muscles at pelvic floor

Female Pelvic Cavity & Viscera

- Viscera belong to terminal parts of uro-genital system [ureters, urinary bladder, uterus, fallopian tubes & ovaries] and digestive systems [rectum].
- The organs are held in pelvic cavity while their openings (outlets) have to go through urogenital [urethra, vagina] and pelvic diaphragms [anal canal] and open in perineum.
- The line of demarcation between pelvis and perineum is attachment of levator ani muscle.

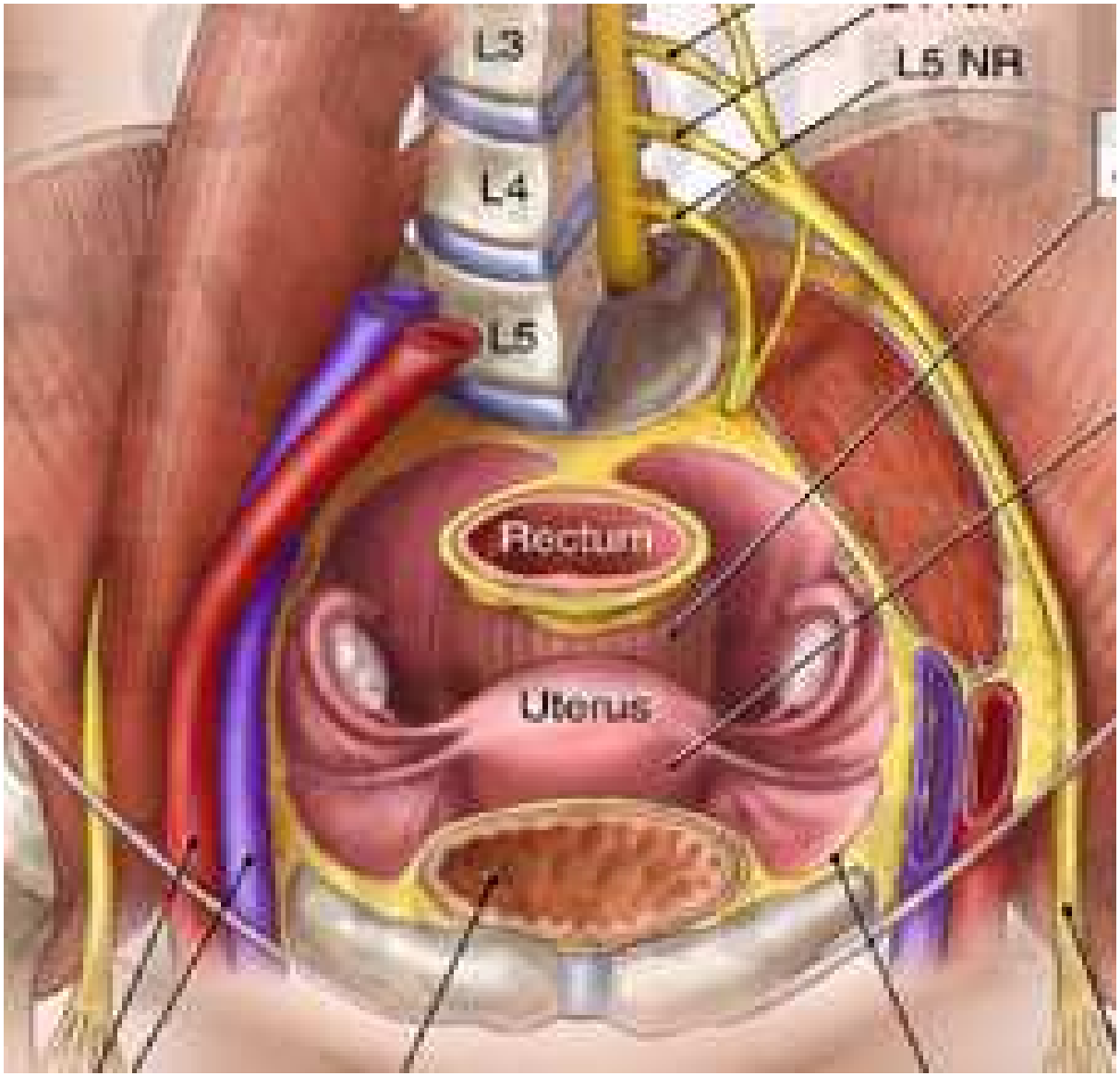
Pelvic viscera: Top-back view



Peritoneum at Pelvis

- Parietal peritoneum is in continuity of abdomen, follows the walls of pelvis
- Uterus & its adnexa may be assumed to have lifted this peritoneum from pelvic floor to create a coronally held shelf of broad ligament, in addition to number of other folds
- Two hollow pouches are created on either side of peritoneally covered uterus, in front utero-vesical pouch and behind recto-uterine pouch [of Douglas].

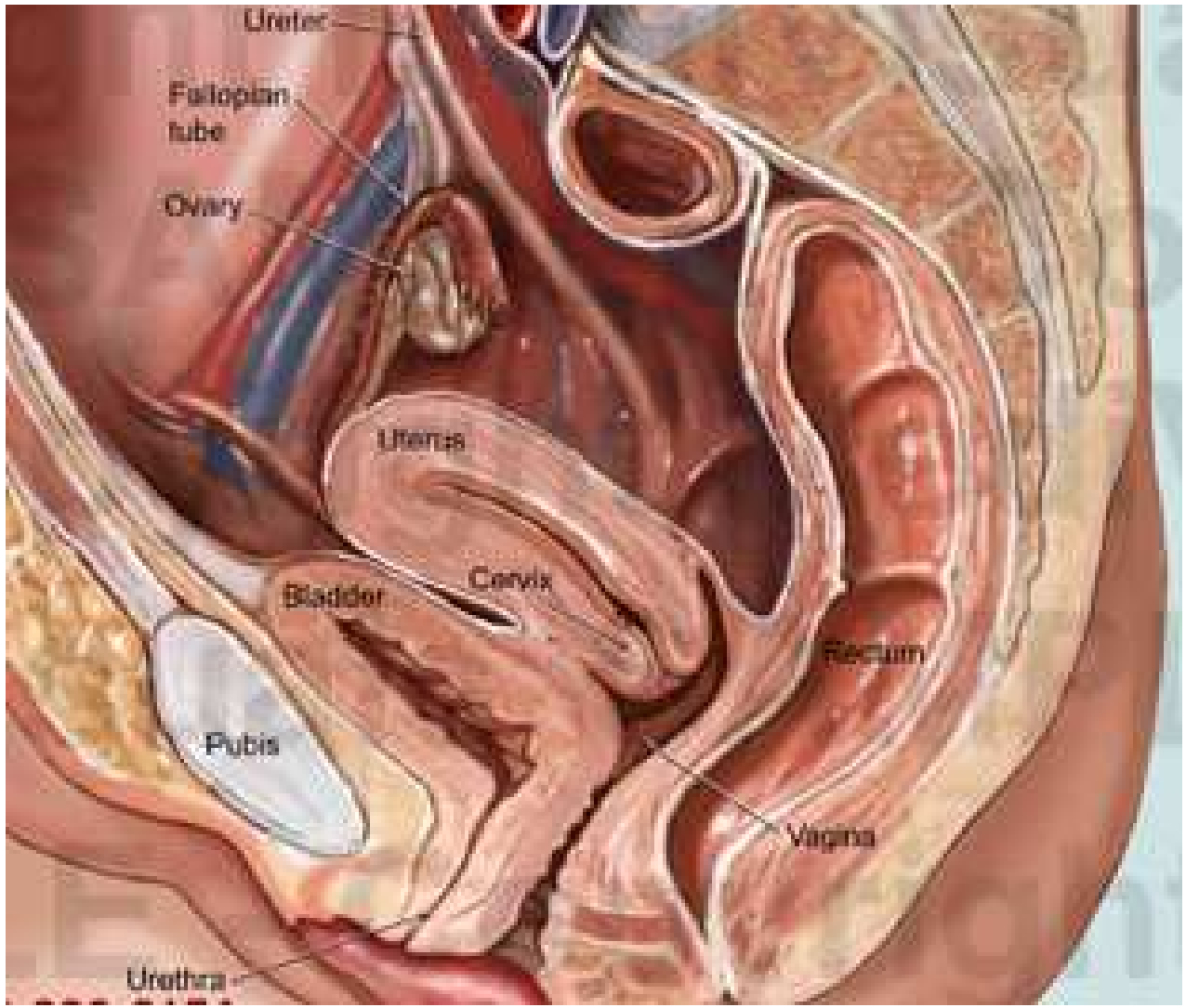
Pelvic viscera (female): front-top view



Pelvic Fascia

- The deep fascia beneath peritoneum of pelvic wall
- Fascia is thickened at places where it surrounds the organs and forms supporting band (ligaments)
- Fascia leaves pelvic wall along the vessels and nerves & reach organs forming vascular pedicles or neuro-vascular bundles for the pelvic viscera and then wraps the viscus as a visceral layer of fascia
- Fascia exists even in absence of peritoneum between the organs (e.g. vesico-vaginal space)
- All muscles (including those of two diaphragms) are covered on their pelvic surfaces by this fascia.

Sagittal section of Female pelvis



Special Designing of Female Pelvis

- The nature provides mechanisms to secure the pelvic viscera at their own places and prevent their undue mobilisation or descent (prolapse) through the pelvic outlet
- Pelvis is specially designed to accommodate foetus during pregnancy and facilitates normal vaginal delivery (parturition) at full term.
- The openings of the outlet are protected by sphincteric mechanisms- both internal (involuntary) and external (voluntary) and thus prevent urinary or faecal incontinence

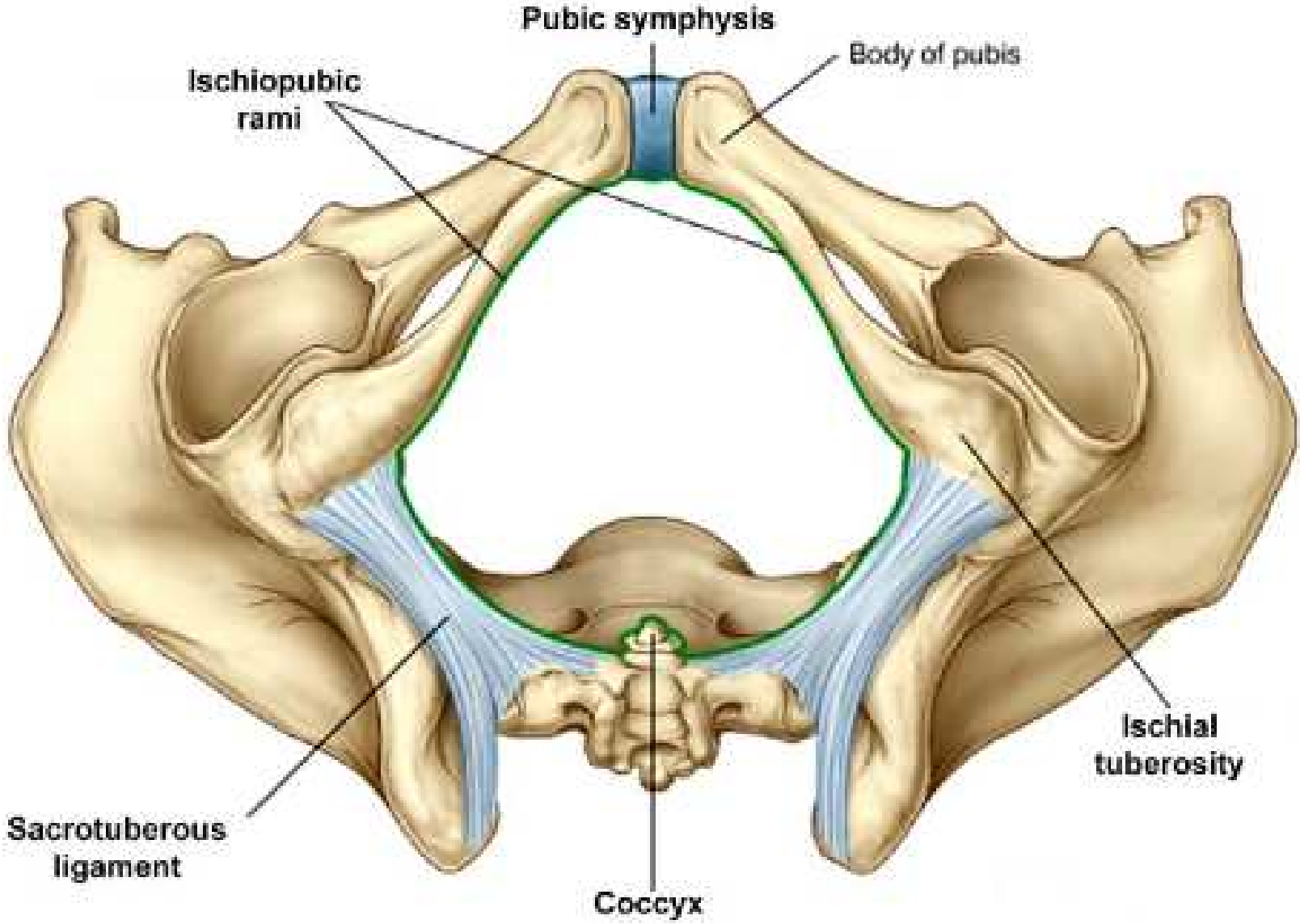
Digital examination of Pelvis

- Pelvis is accessible for digital examination by Per rectal (P/R) or per vaginal (P/V) route, in specific positions such as knee-elbow, lithotomy or P/R.
- One can not go above the levels of ischial spines
- Recto-uterine fossa is the most dependant part of peritoneal cavity; approachable via posterior vaginal fornix (colposcopy and culdescentasis).

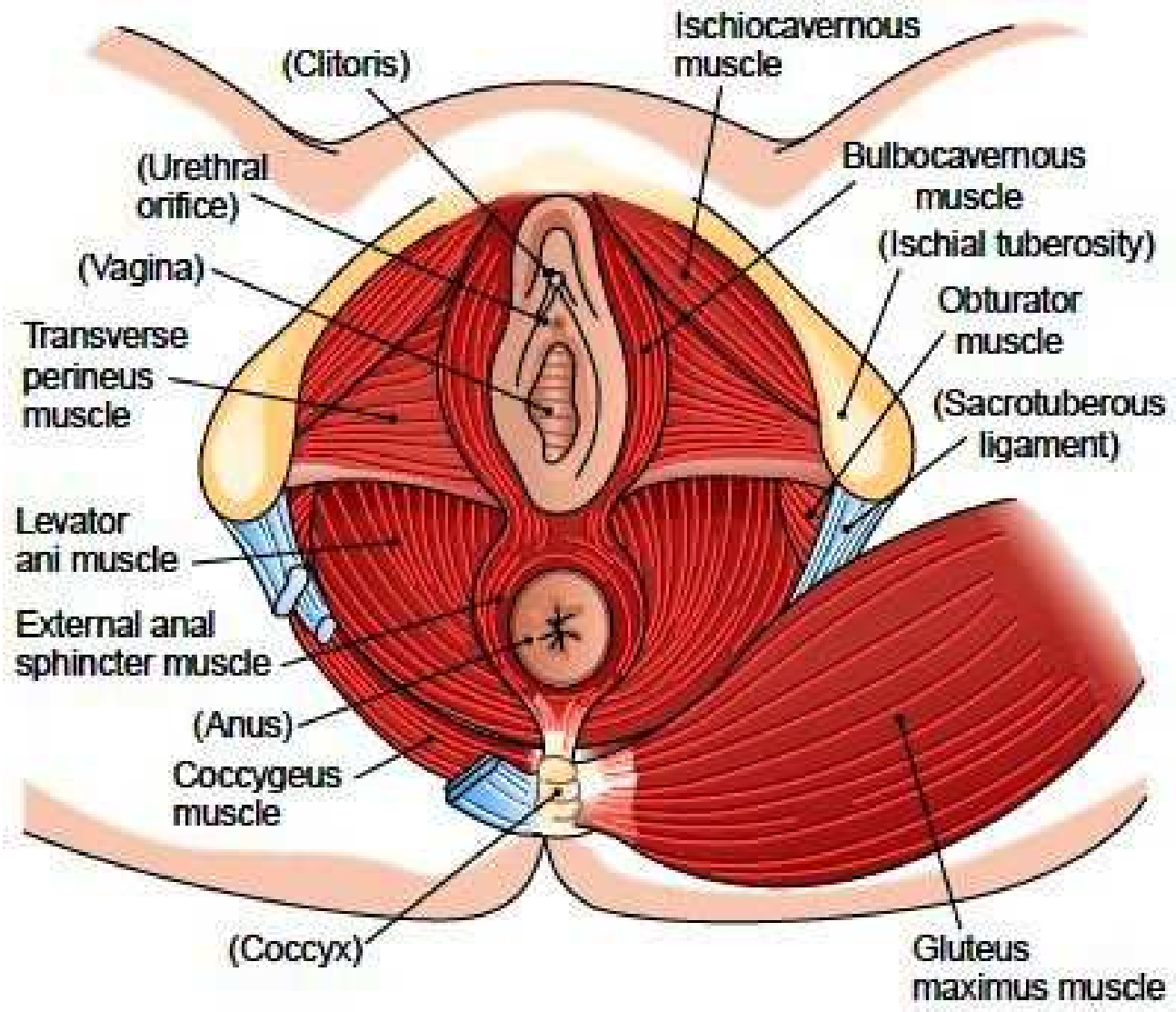
Perineum: the Outlet area

- The soft tissue encountered at the diamond shaped interval of the pelvic outlet, comprises the perineum where three outlets- urethra, vagina and anal canal, are affecting the mid line portions.
- The former two openings are in urogenital Δ while the latter is in anal Δ
- The direction of terminal part of the hollow passages at pelvic outlet follow the slopes of corresponding Δs.

Outlet of Bony pelvis



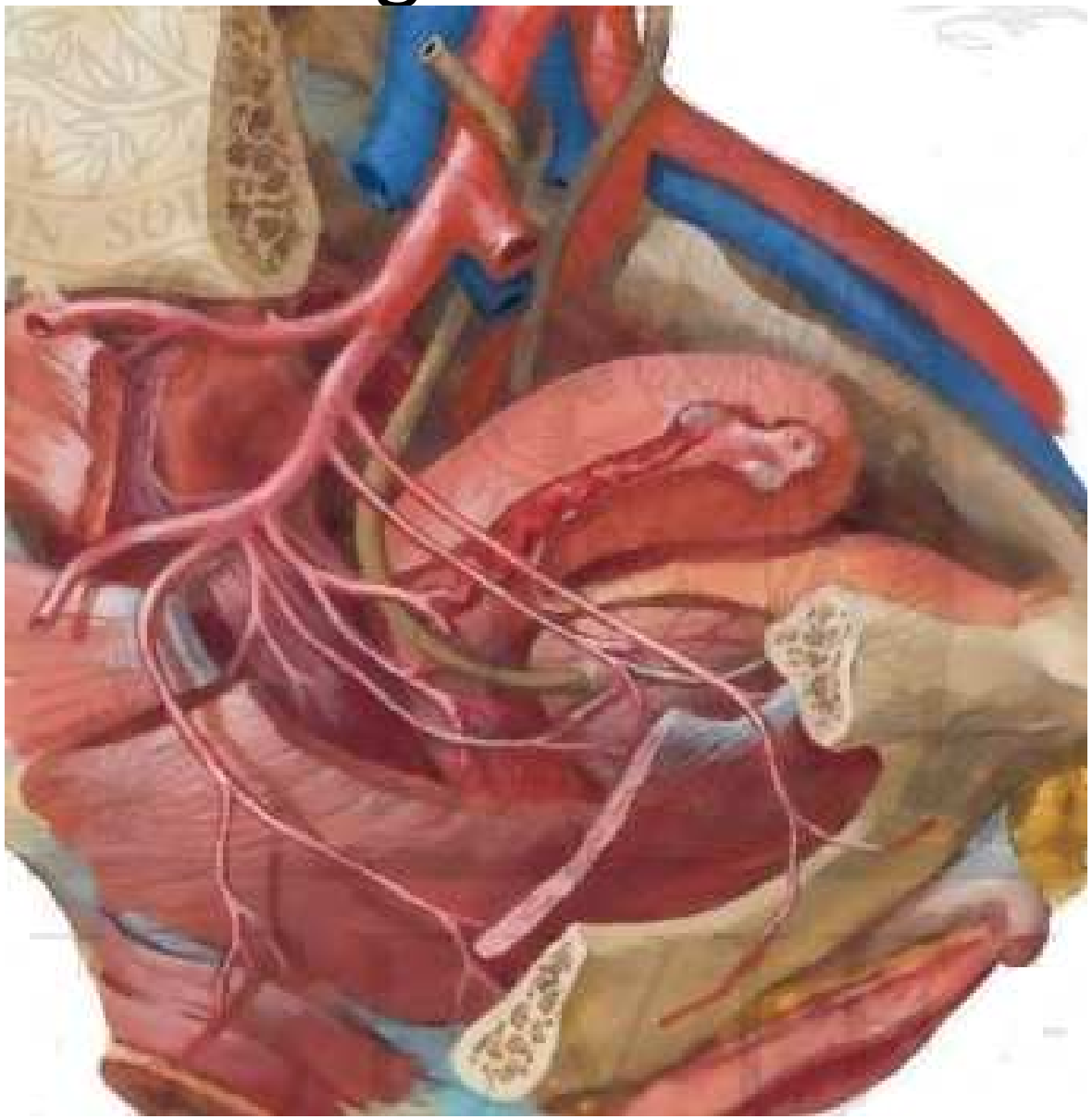
Perineal muscles viewed from below



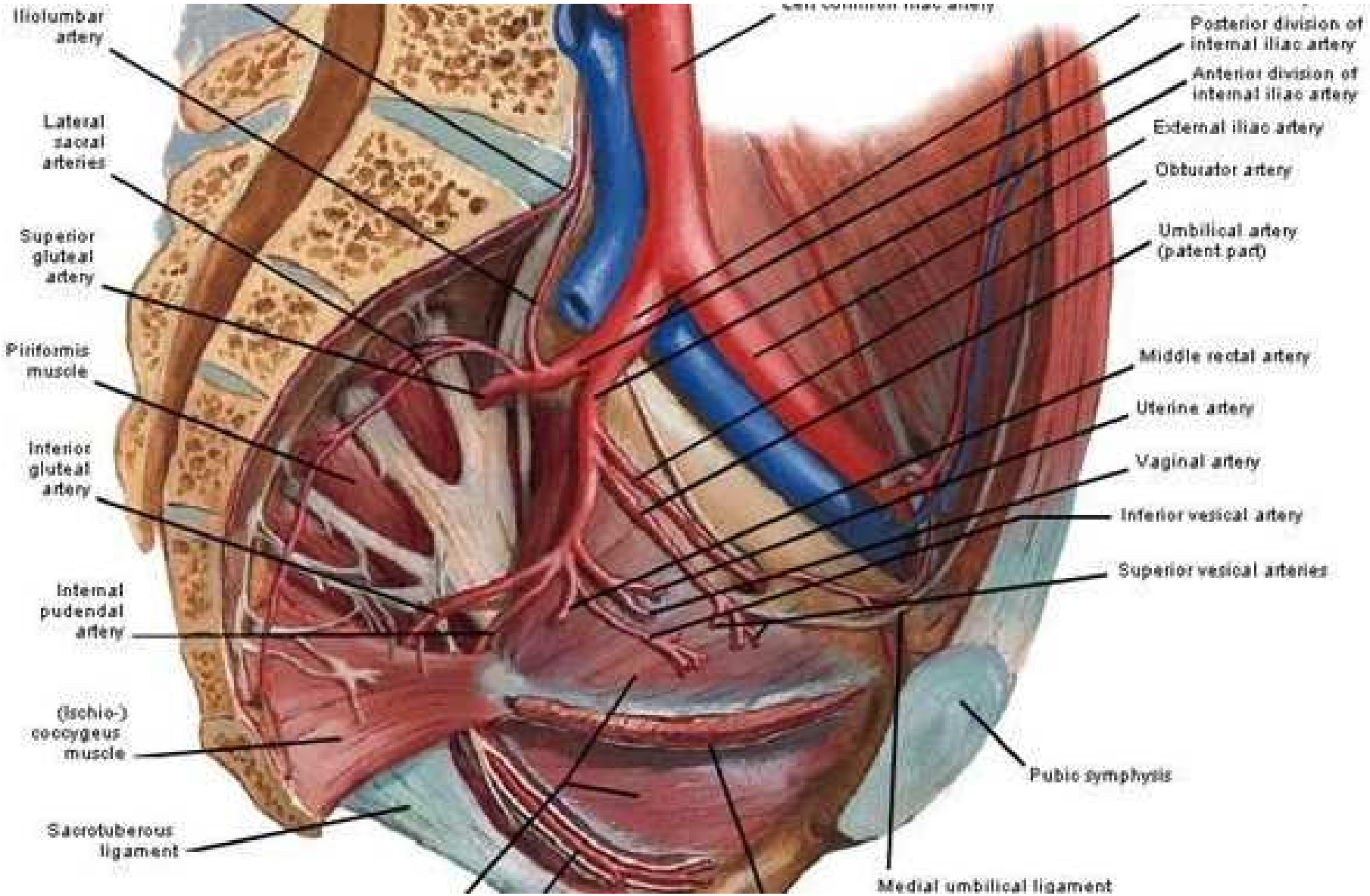
Blood vessels of female pelvis

- The chief source of blood to pelvic viscera & perineum is through Internal iliac artery.
- The corresponding vein drains the blood from same and empties in inferior vena cava..
- Lymphatics mostly accompany the stem arteries and drain in different lymph nodes confined to pelvis or abdomen.

Internal Iliac artery (Rt): viewed from right side of female pelvis



Lt. Internal Iliac artery (viscera removed)



Lymph nodes of Pelvis (female)

Chief groups are four:

1. External Iliac
2. Internal iliac
3. Common Iliac
4. Sacral

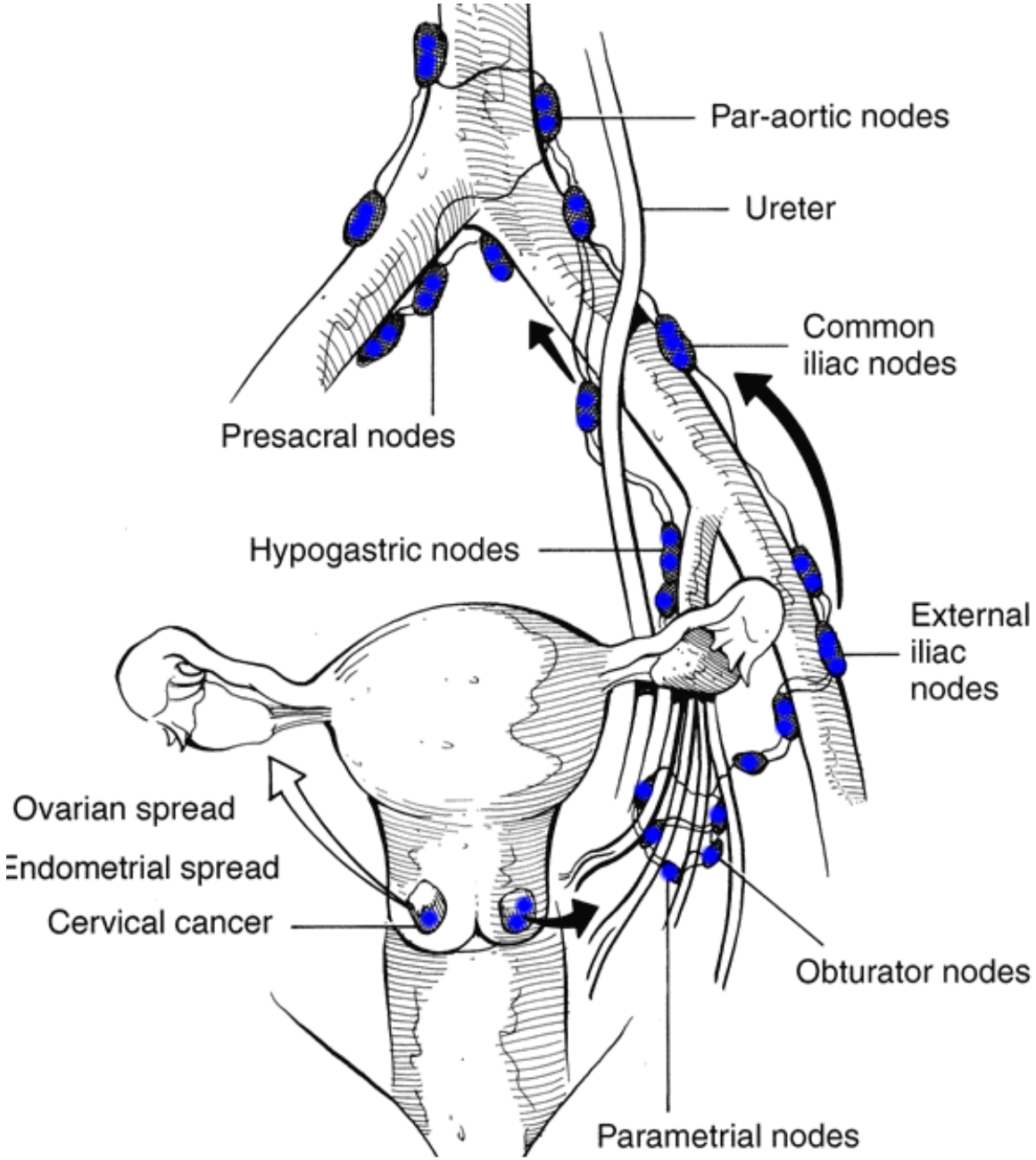
A few more recognised groups are:

- Obturator (along obt. artery)
- Para cervical (at crossing of uterine a & ureter)
- Para Rectal (at recto-sigmoid Jn.) with sup. rect. a.

[Superficial inguinal nodes drain uterine cornu, perineum]

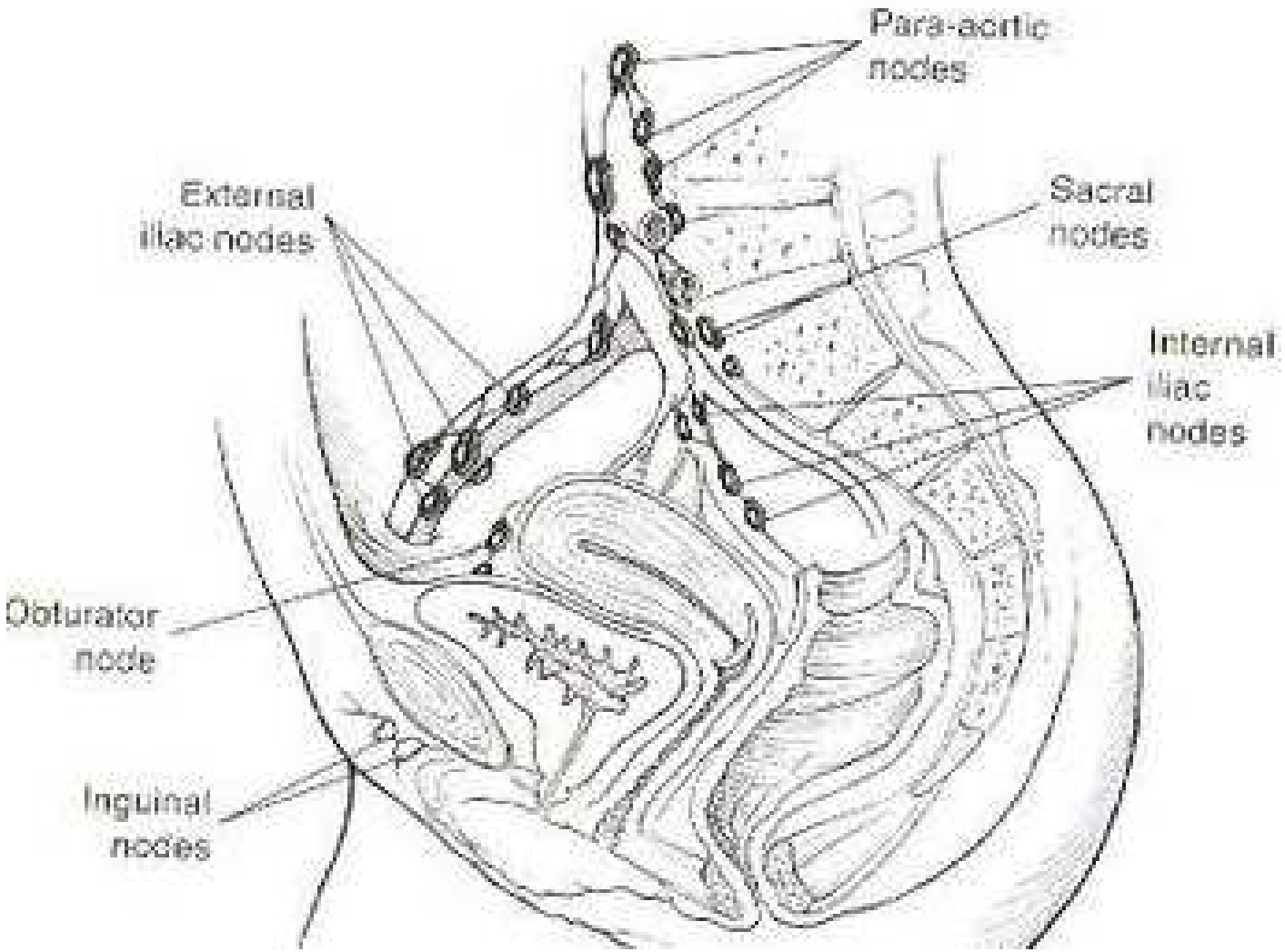
Lymphatic drainage of uterus

Gynaecological L.N.

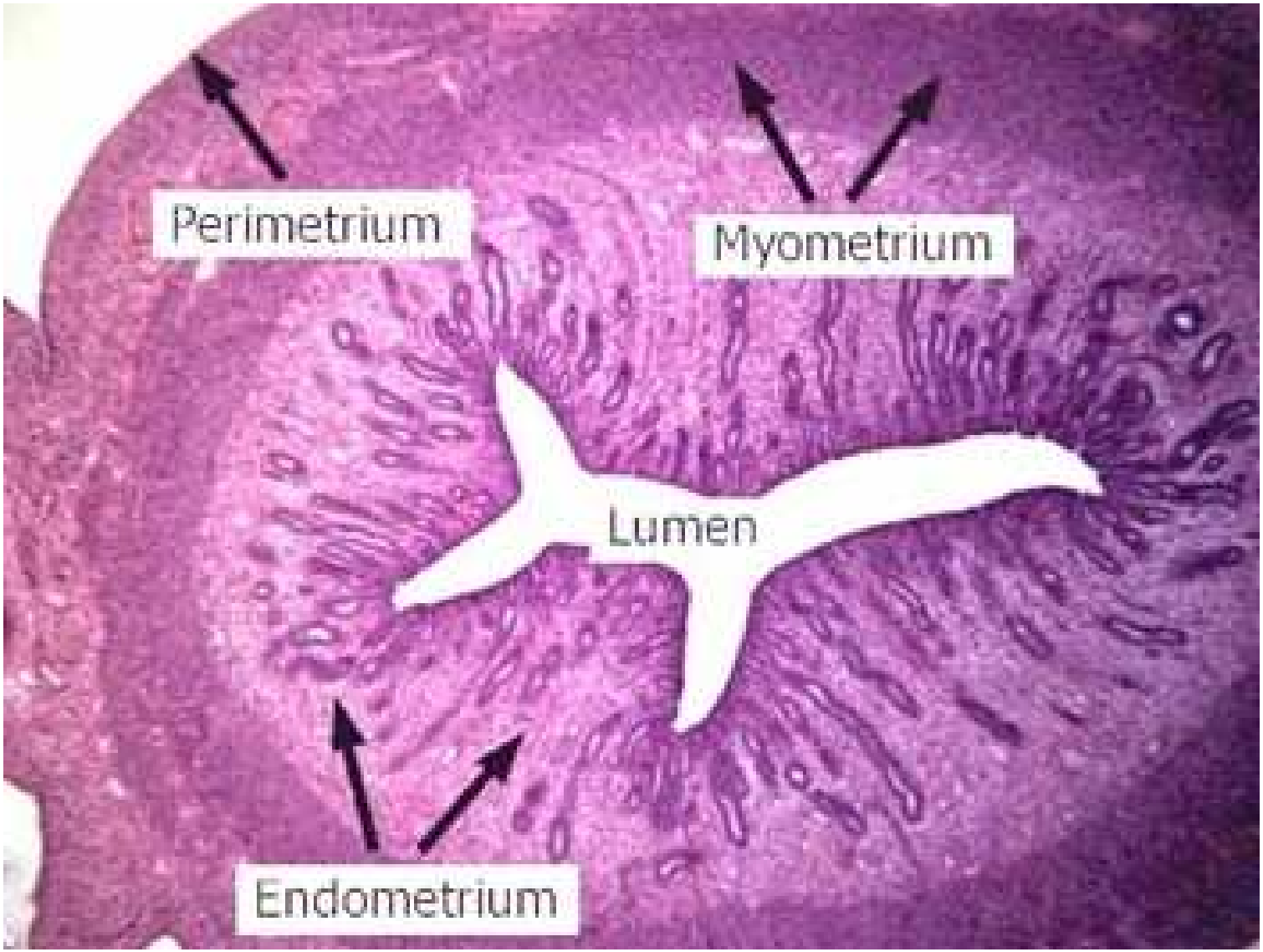


Regional L.N.

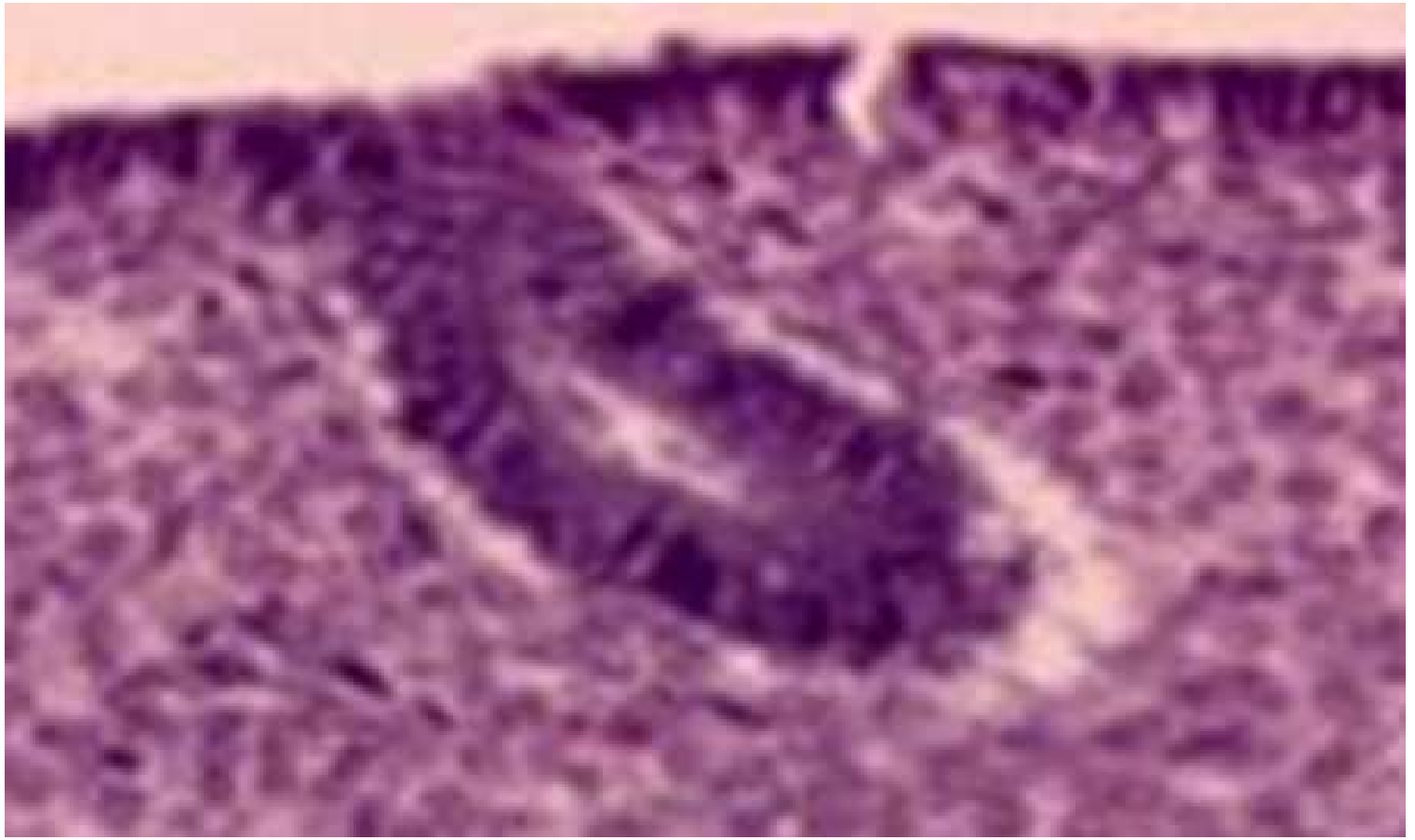
Paracervical, para-metrial, hypogastric (obturator), common, internal & external iliac, presacral, and sacral



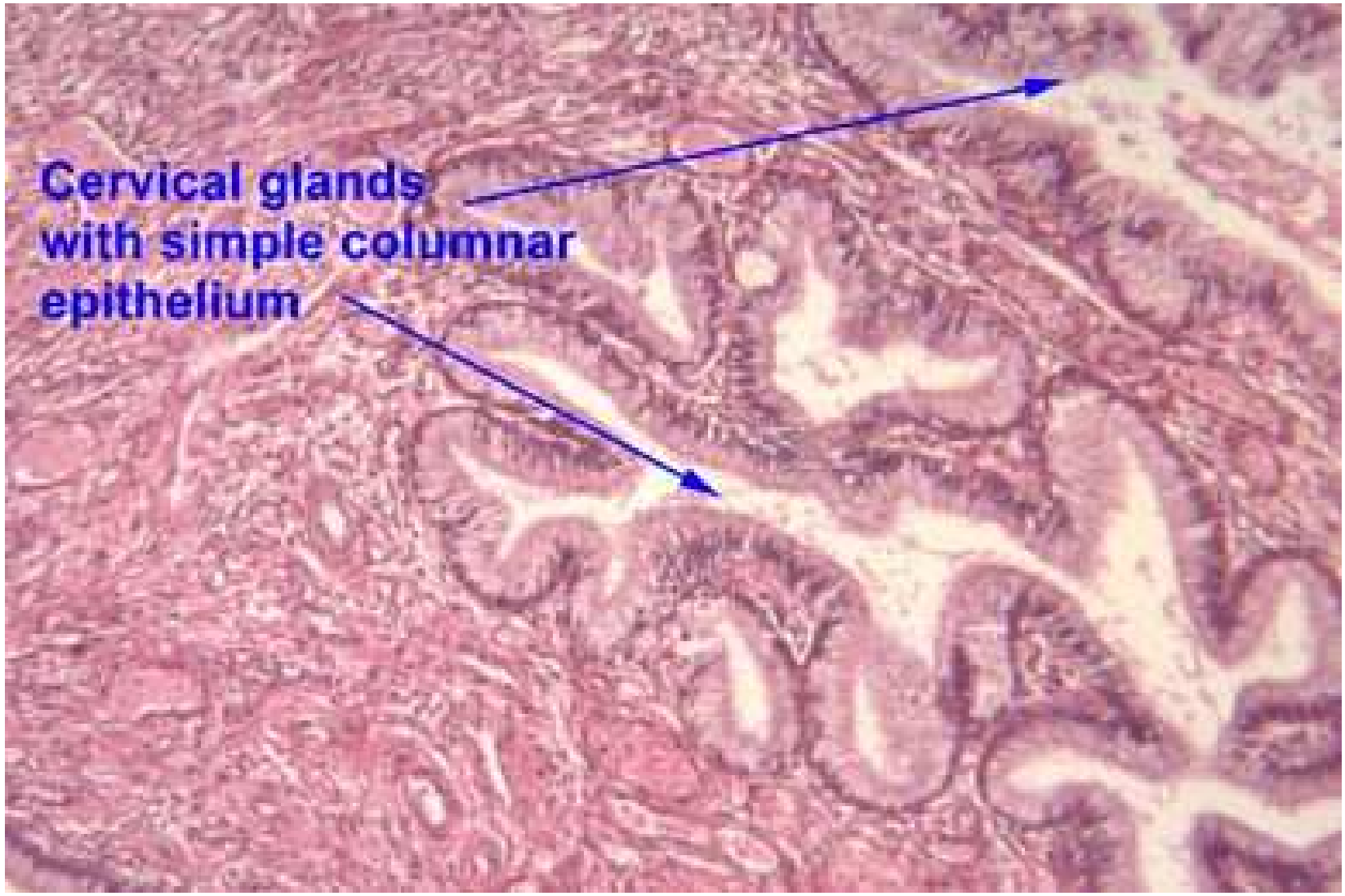
Microscopic structure: uterus



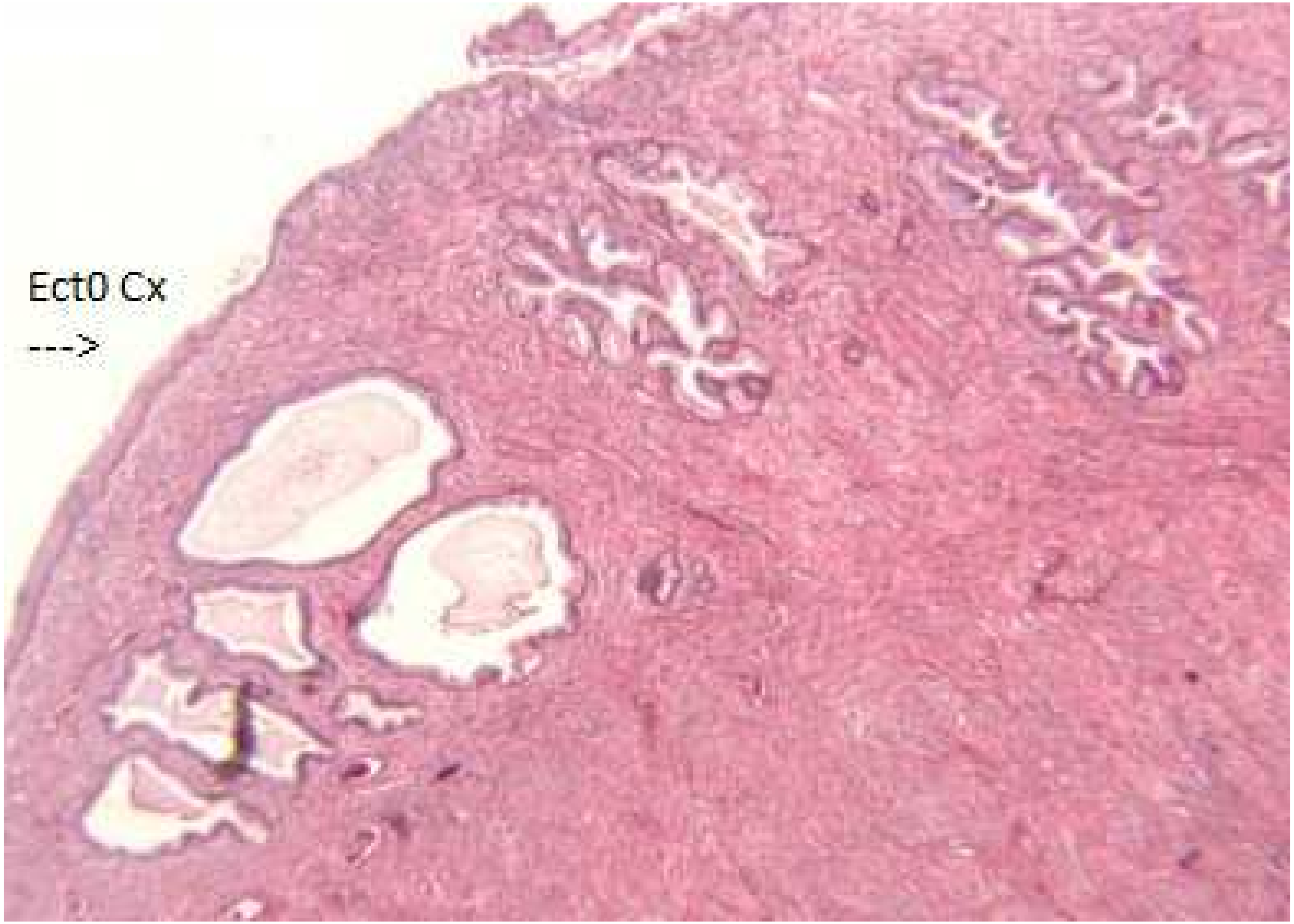
Lining epithelium of endometrium



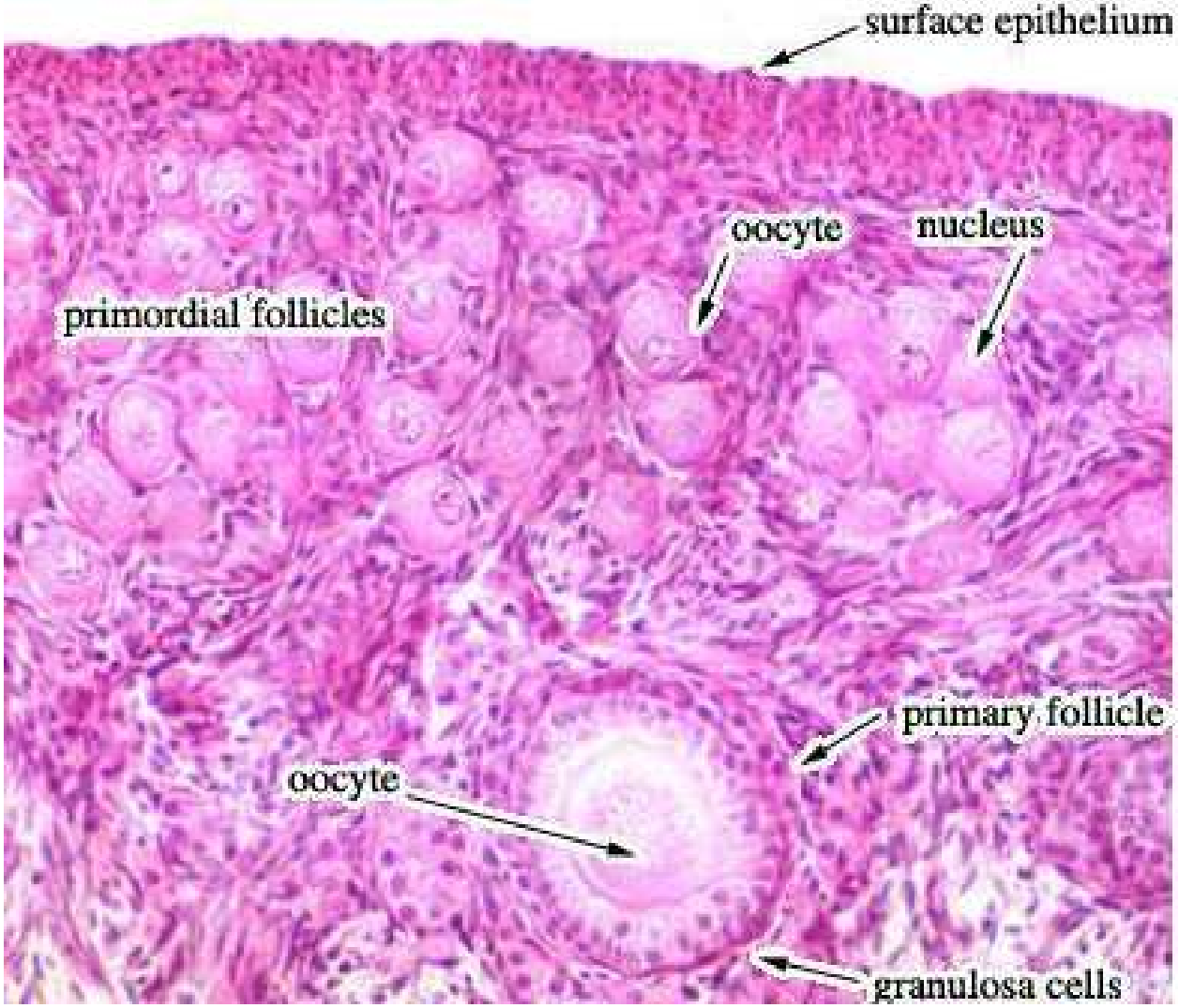
Cervix (endocervical canal)



Ecto-cervix at Ext. os



Structure of ovary



Carcinomatous change

- Common at the external os of cervix
- Stratified squamous epithelium may replace the columnar one near Junctional region- Squamous metaplasia, a fore runner of cancer.
- Uterine endometrium is another sourceise in
- Variety of tumour/cysts arise in ovary, germ line epithelium is a common source

Thanks for patient listening!