

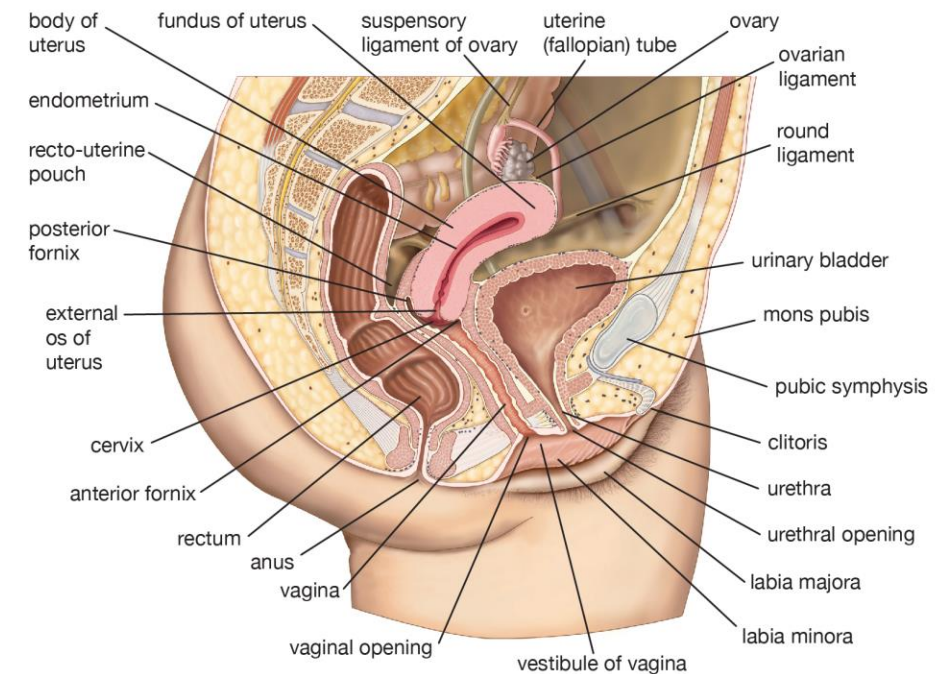
UTERUS



Presented by:
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KGMU, UP, Lucknow

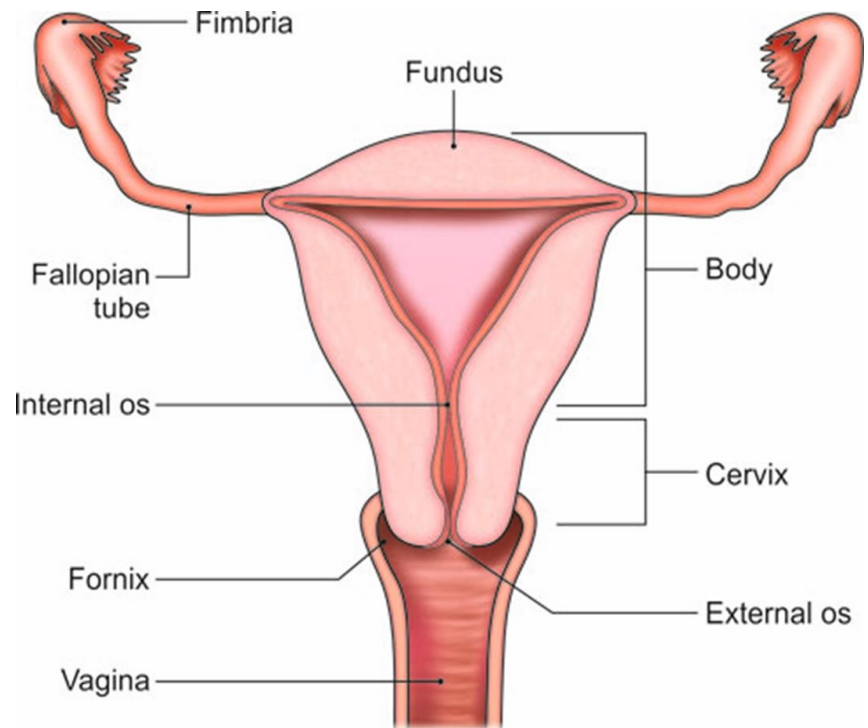
Uterus

- Synonyms: Womb, Hystera (G).
- Child bearing organ in females situated in the pelvis b/w bladder and rectum.
- Inverted pear shaped, thick-walled hollow muscular organ.



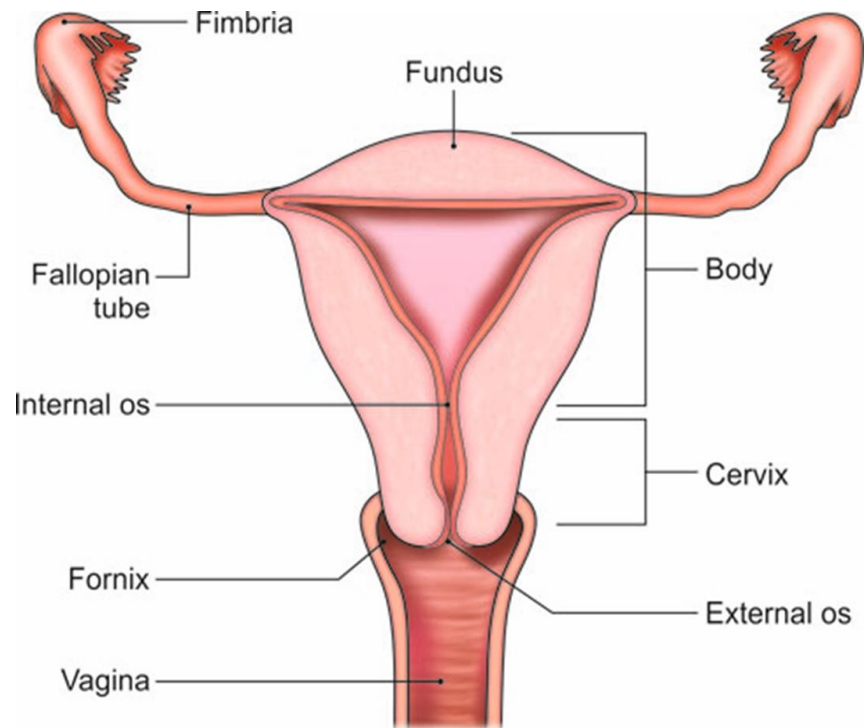
Uterus

- Body- Upper expanded part.
- Cervix - Lower cylindrical part.
- Isthmus- Circular constriction b/w the body and cervix. Corresponds to the internal os.
- Lower uterine segment- Upper $\frac{1}{3}$ rd of cervix.
- Conducting part- lower segment.
- Propulsive part- upper segment.



Measurements and Communications

- Length: 3", breadth: 2", thickness: 1".
- Weight: 30-40 gm.
- Superiorly on each side: communicates with uterine tube.
- Inferiorly: communicates with the vagina.



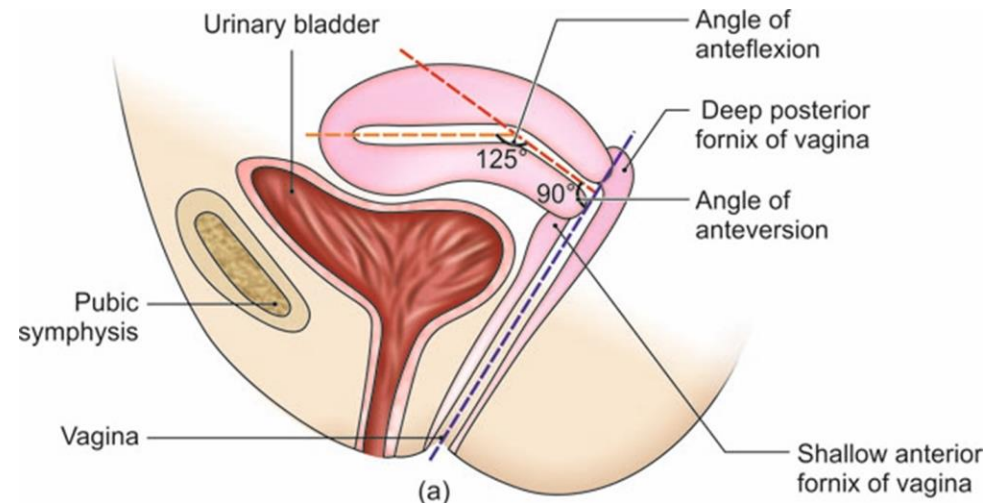
Normal Position and Angulations

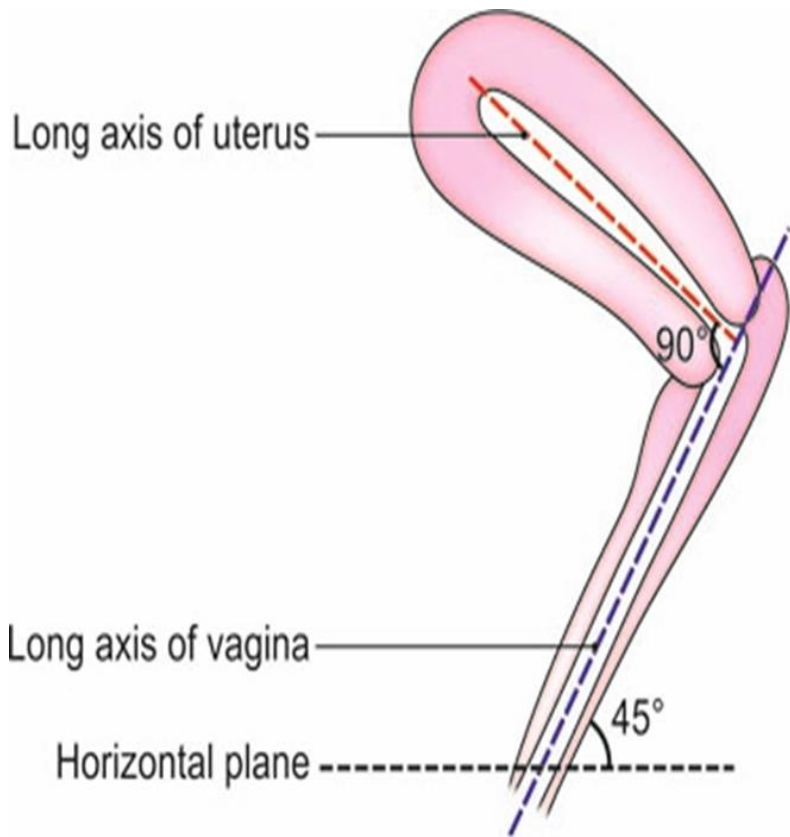
- Anteverted & anteflexed.

Anteversion: forward angulation b/w the cervix and vagina (90°).

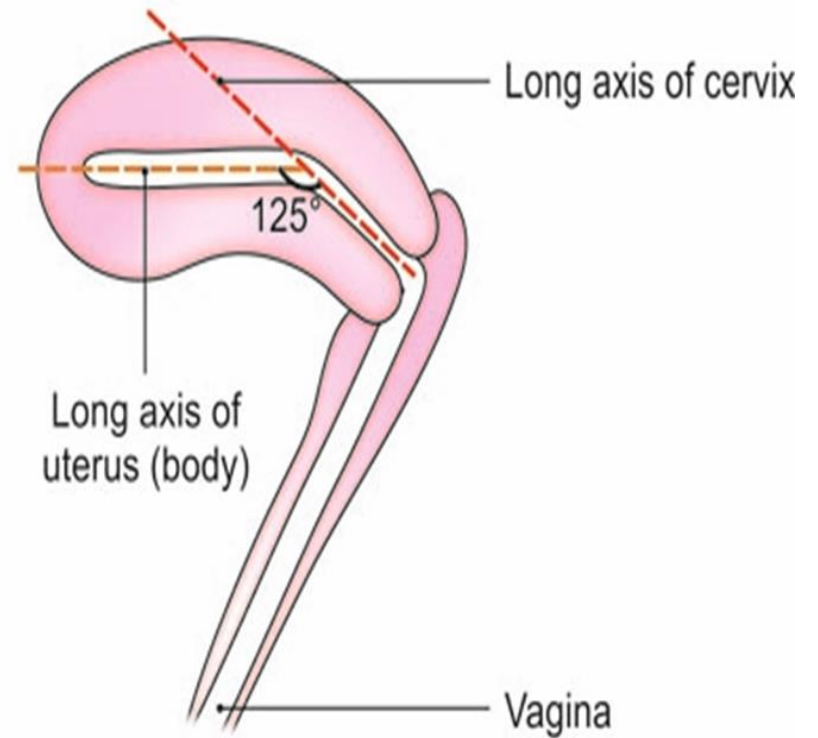
Anteflexion: forward angulation b/w the body and cervix ($120-125^\circ$).

- Long axis of uterus corresponds to the axis of pelvic inlet.





Angle of Anteversion



Angle of Anteflexion

Gross Anatomy

Division of Uterus:

(a) Body: upper 2/3rd part.

(b) Cervix (neck): lower 1/3rd part.

- **Body of the uterus:**

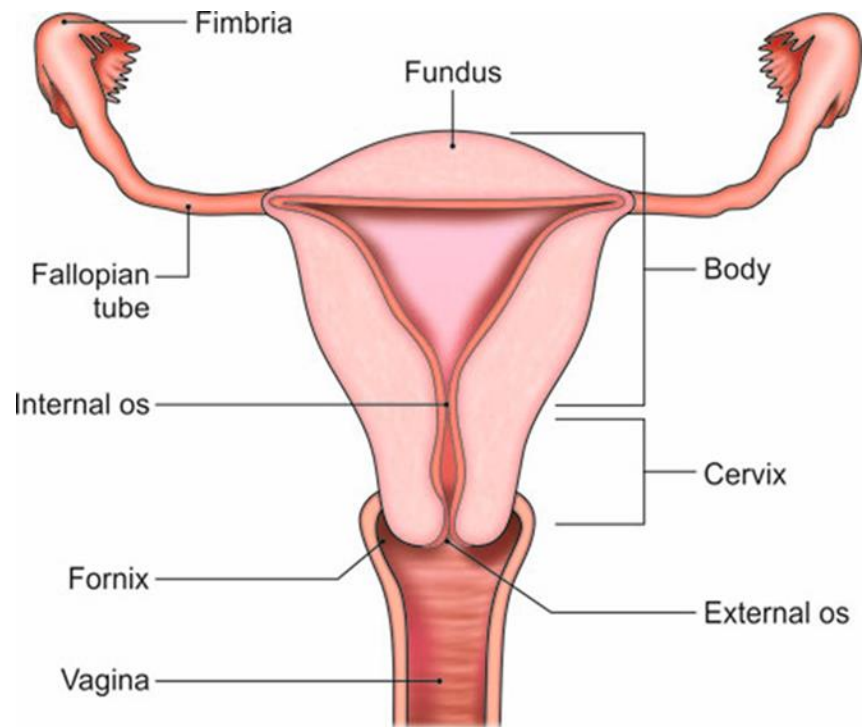
(a) Fundus

(b) 2 surfaces:

(i) Anterior/ vesical

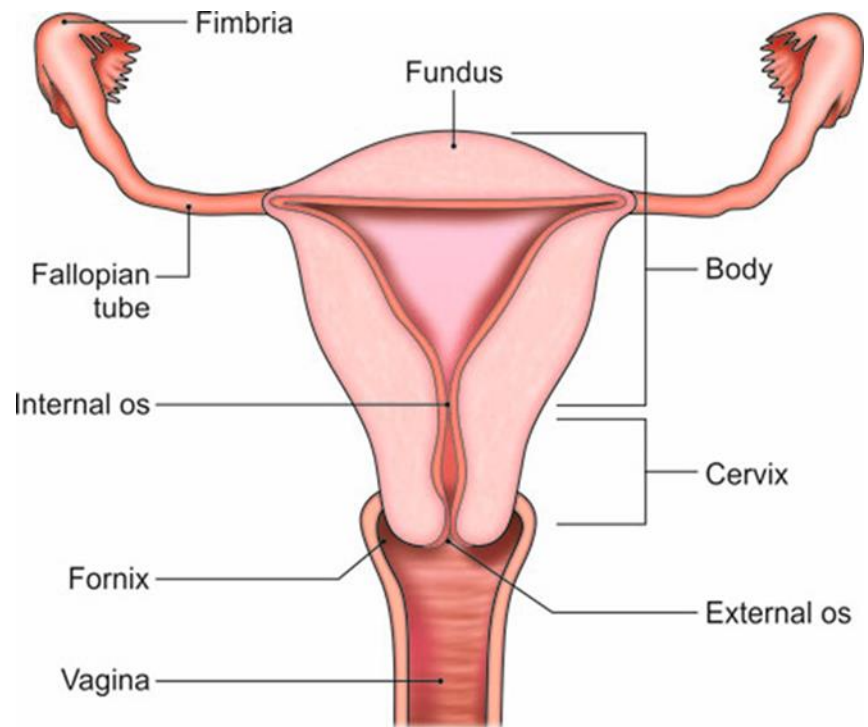
(ii) Posterior/ intestinal

(c) 2 lateral borders



Fundus of the Uterus

- Lies above the entrance of the two uterine tubes.
- Convex like a dome.
- Covered with peritoneum and is directed forwards when the bladder is empty.
- Does not contain the uterine cavity.
- The fertilized ovum is implanted usually in the posterior wall of the fundus.



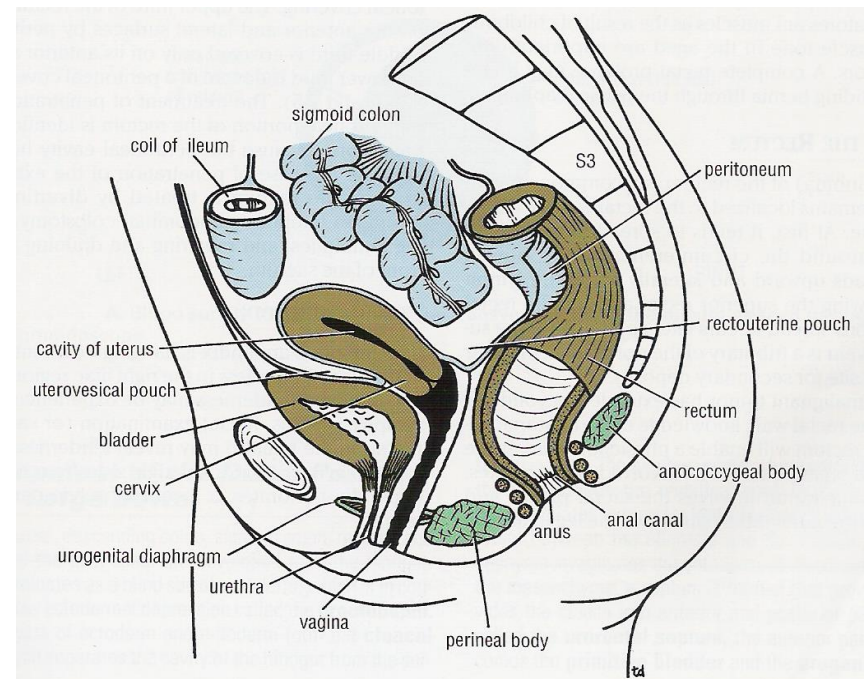
Surfaces of the Uterus

Anterior (vesical) surface :

- Flat & related to urinary bladder.
- Directed downwards & forwards.
- Covered with peritoneum.
- Forms the posterior wall of the utero-vesical pouch.

Posterior (intestinal) surface:

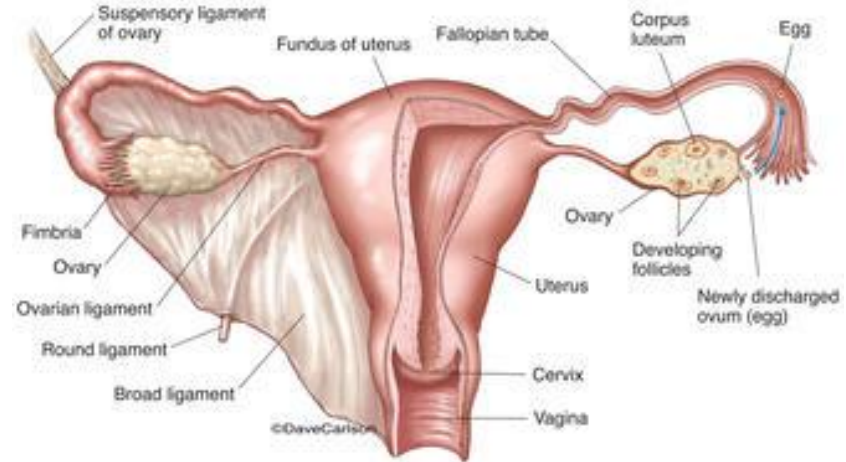
- Convex & related to terminal coils of ileum and sigmoid colon.
- Covered with peritoneum.
- Forms the anterior wall of the rectouterine pouch.



Borders of the Uterus

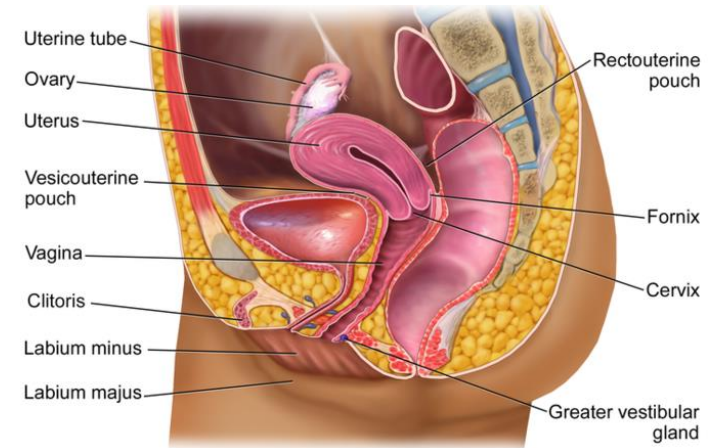
Lateral border:

- Rounded and convex.
- Provides attachment to the broad ligament of uterus.
- Uterine tube opens into the uterus at the upper end of this border.
- The round ligament of uterus is attached anteroinferior to the tube.
- The ligament of ovary is attached posteroinferior to the tube.
- Uterine artery ascends along the lateral border b/w 2 layers of broad ligament.

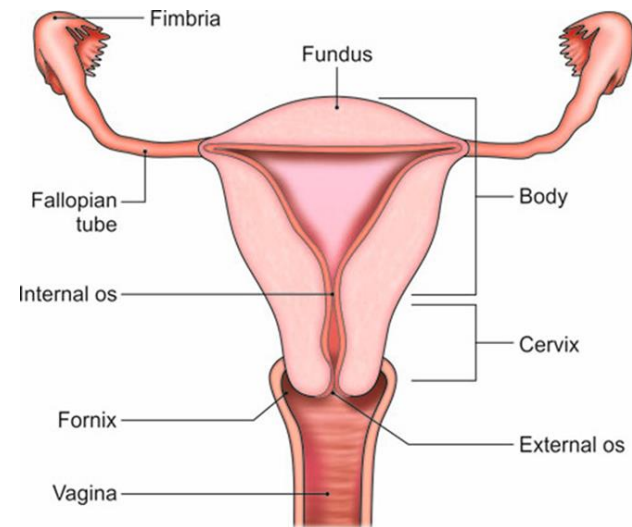


Cavity of the Uterus

- Vertical slit in sagittal section
- Triangular in coronal section
- Base is formed by the fundus
- Apex is formed by the internal os
- Communicates with the cervical canal through the internal os
- Endometrium: Mucous membrane of the uterine cavity

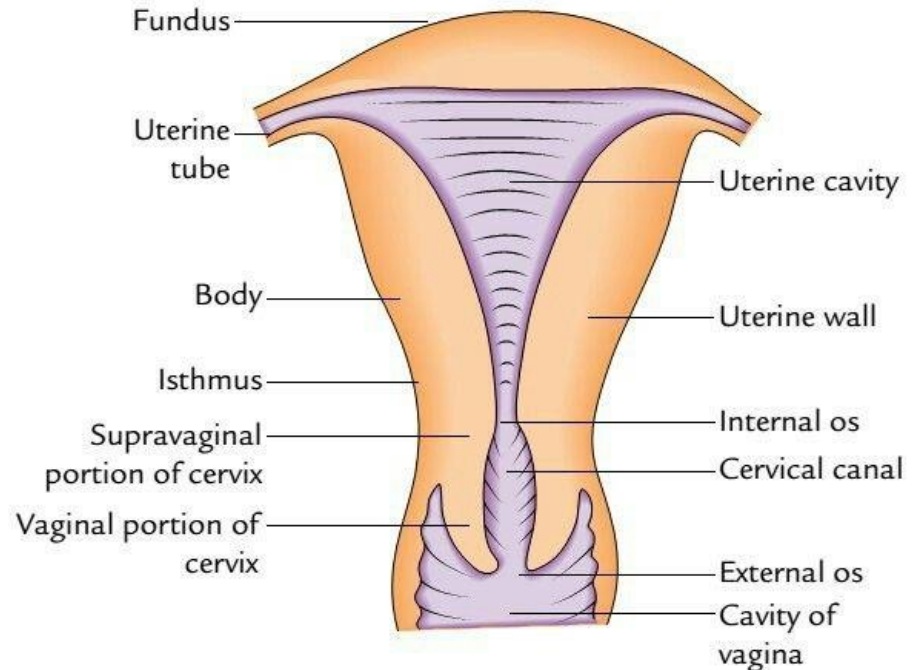


<https://courses.lumenlearning.com/boundless-ap/chapter/the-female-reproductive-system/>



Cervix

- Lower cylindrical part of uterus lying below the level of internal os.
- Less mobile than the body.
- Length: 2.5 cm
- The lower part of cervix projects into the anterior wall of vagina which divides it into the supravaginal and vaginal parts.



Supravaginal part of Cervix

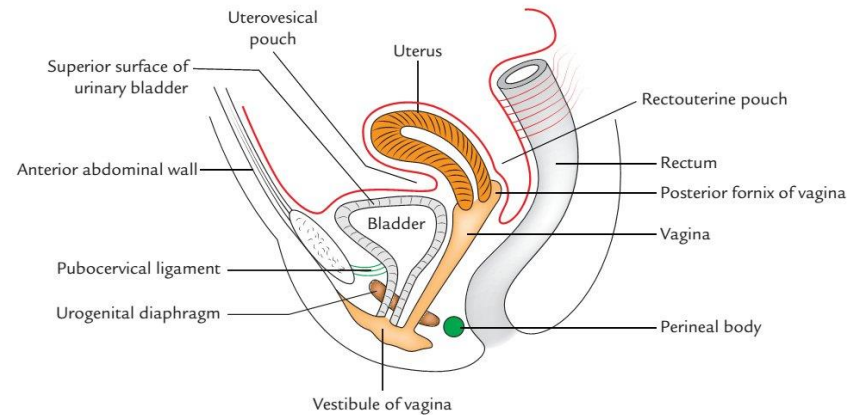
Relations:

Anteriorly- base of bladder

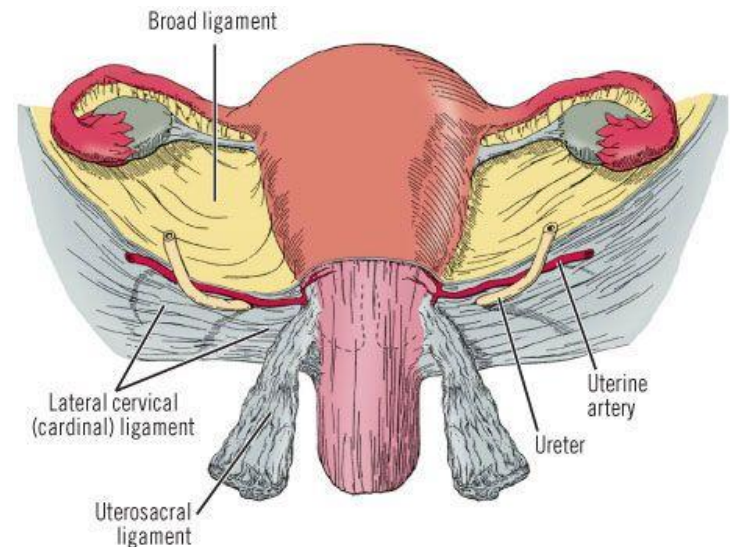
Posteriorly- rectouterine pouch with intestinal coils and rectum

On each side-

- Ureter
- Uterine artery
- Attachment of Mackenrodt's ligament
- Lower attached margin of the broad ligament



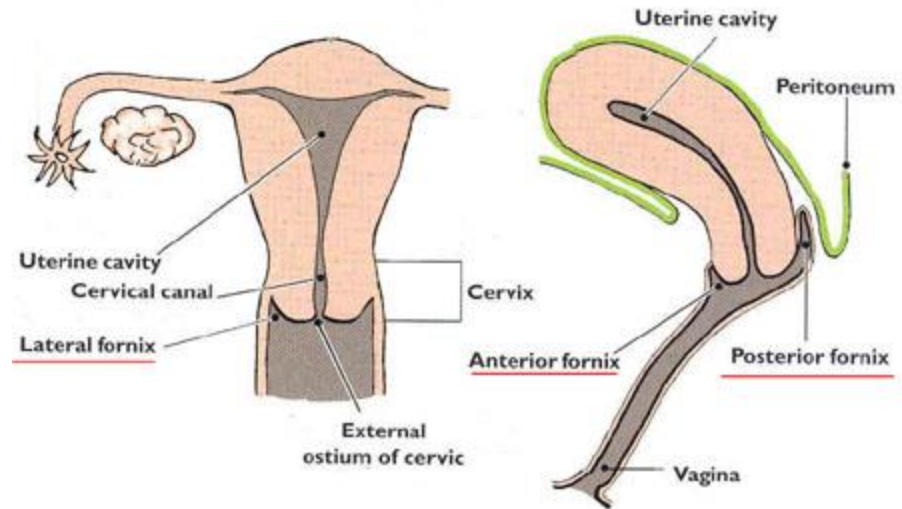
<https://y7177.com/sa/anato/uterus/uterus-relation.htm>



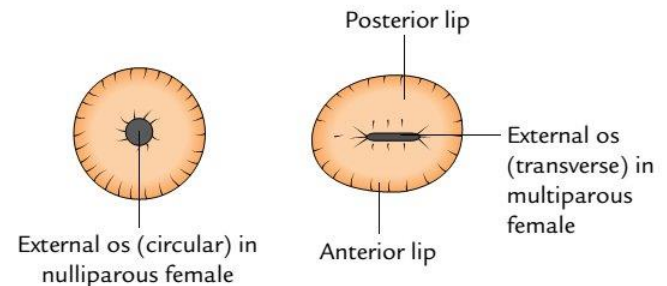
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Vaginal part of Cervix

- Conical in shape.
- Projects into the anterior wall of vagina forming the vaginal fornices (anterior, posterior and 2 lateral).
- Cervical canal opens into the vagina by an opening called the external os.
- External os is small and circular in nulliparous women.
- In multiparous women, the external os is bounded by the anterior and posterior lips.



http://ksumsc.com/download_center/Archive



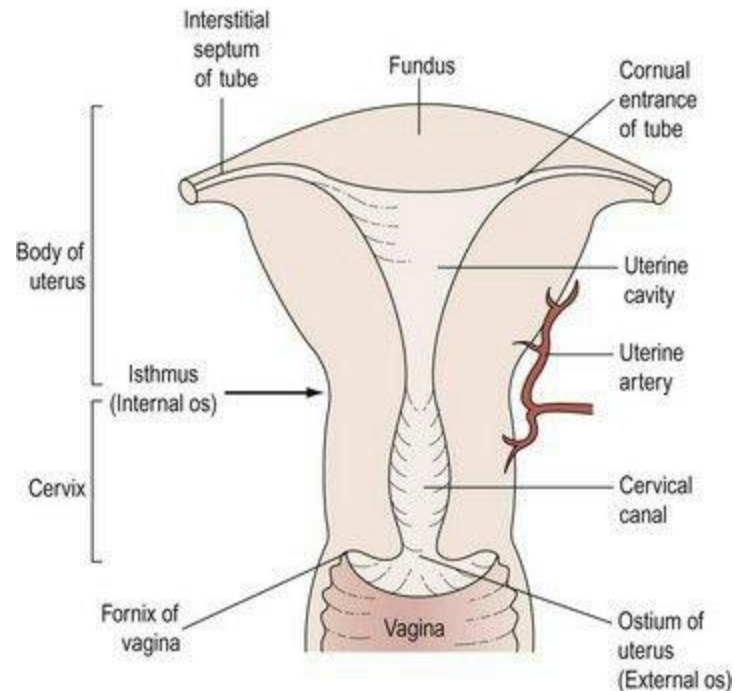
shapes of external os

in nulliparous and multiparous females.

<https://y7177.com/sa/anato/uterus/uterus-relation.htm>

Cervical Canal

- Fusiform in shape.
- Flattened from before backwards.
- Communicates with the uterine cavity above, through the internal OS.
- Communicates with the vaginal cavity below, through the external OS.
- **Arbor vitae uteri:** mucosal folds in the anterior & posterior walls of canal which resemble the branches of a tree.
- Mucosal folds interlock with each other and close the canal.



Ligaments of Uterus

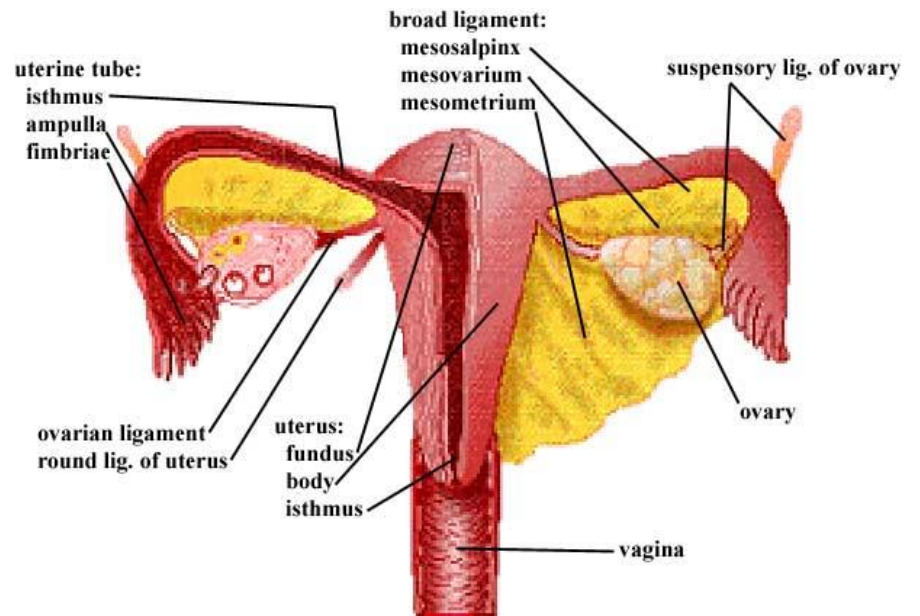
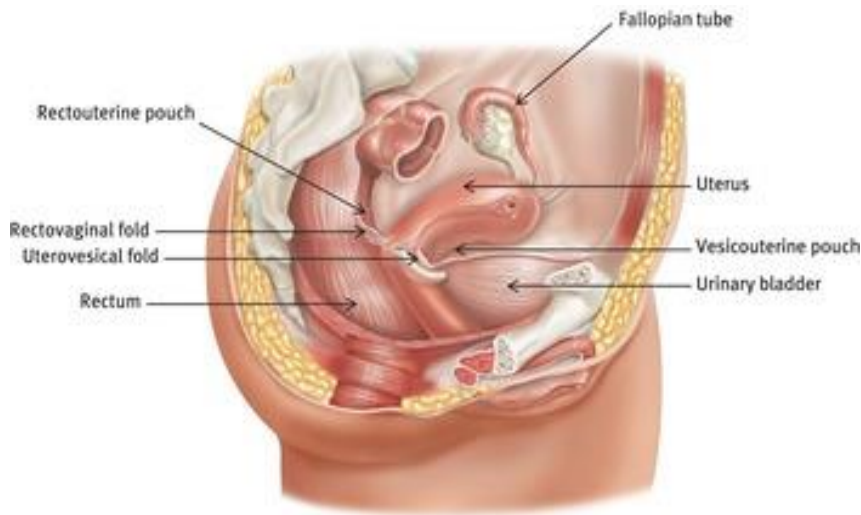
(A) Peritoneal ligaments:

1. Anterior false ligament- consists of uterovesical fold of peritoneum.
2. Posterior false ligament- consists of rectovaginal fold of peritoneum.
3. A pair of Broad ligaments

(B) Fibromuscular ligaments:

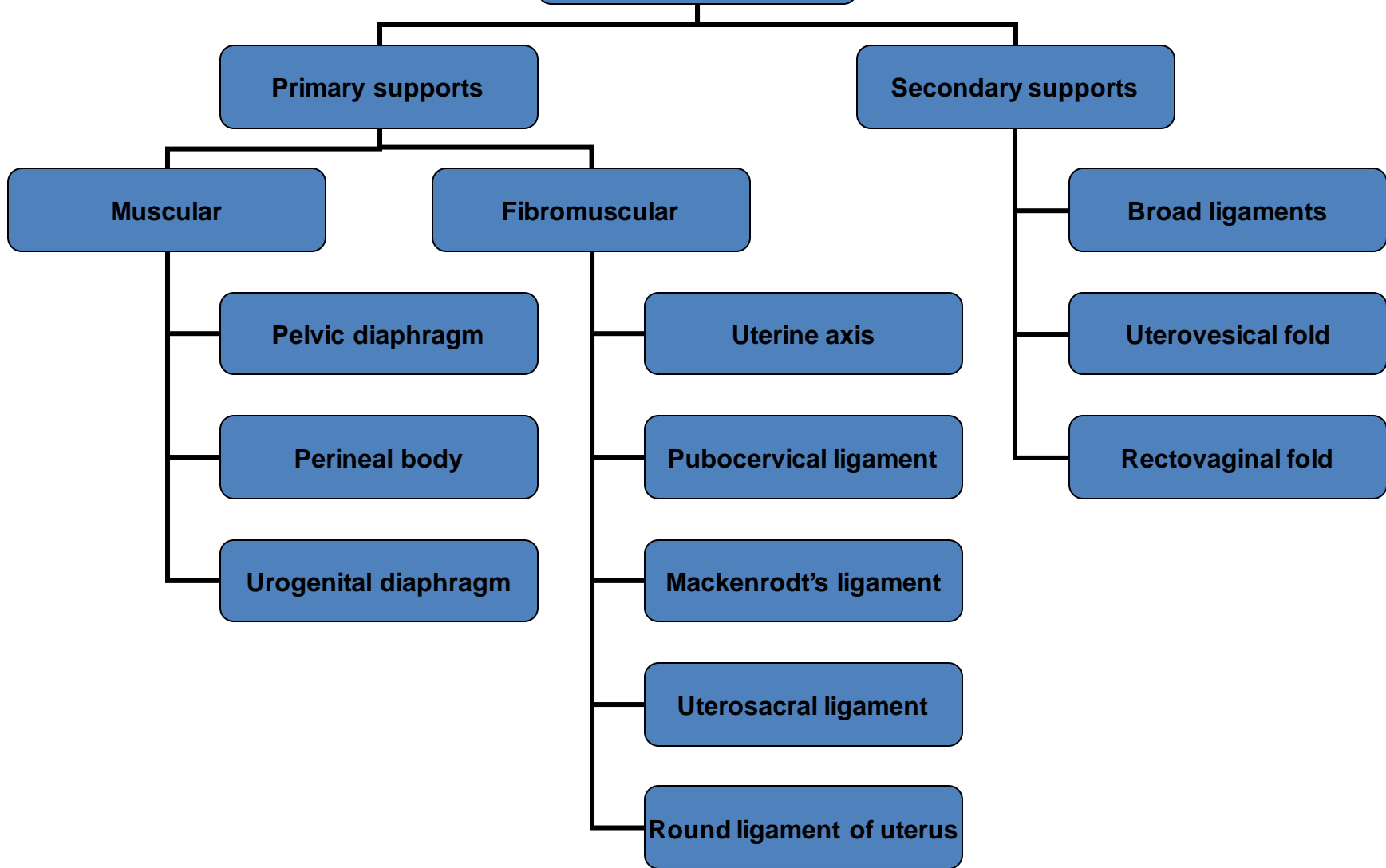
1. Round ligaments of uterus
2. Transverse cervical ligaments
3. Uterosacral ligaments
4. Pubocervical ligaments

Peritoneal Ligaments



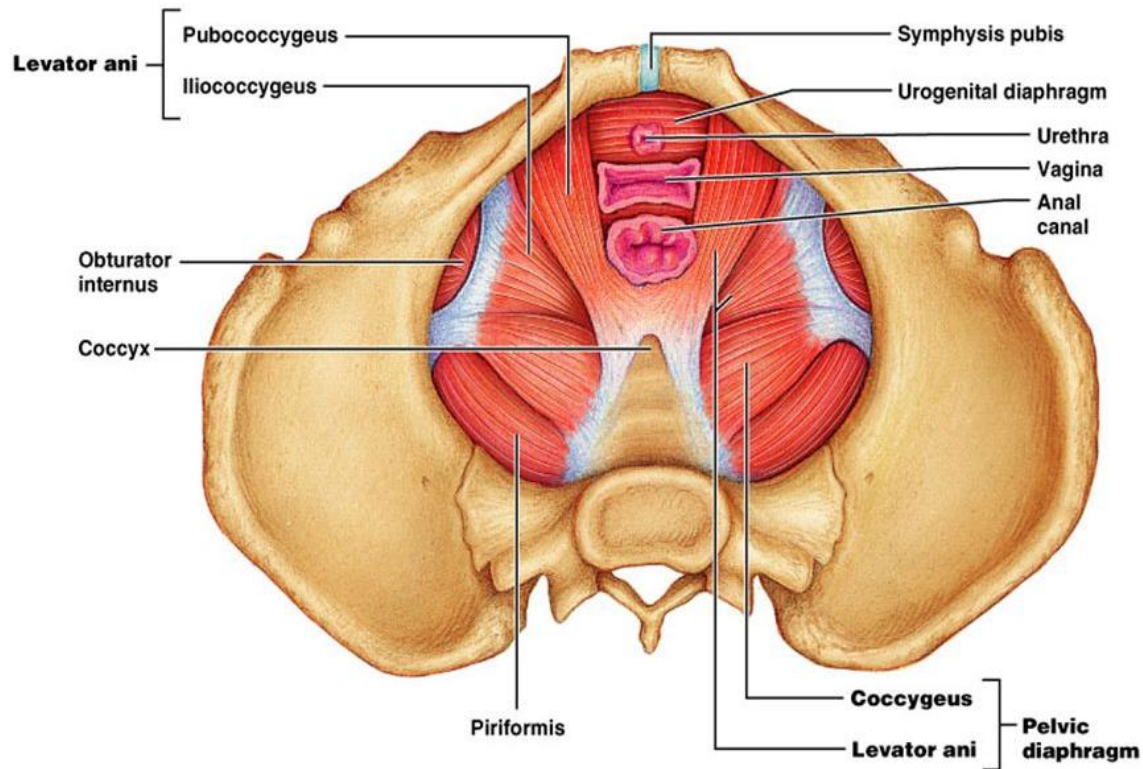
<https://www.cambridge.org>

Supports of Uterus

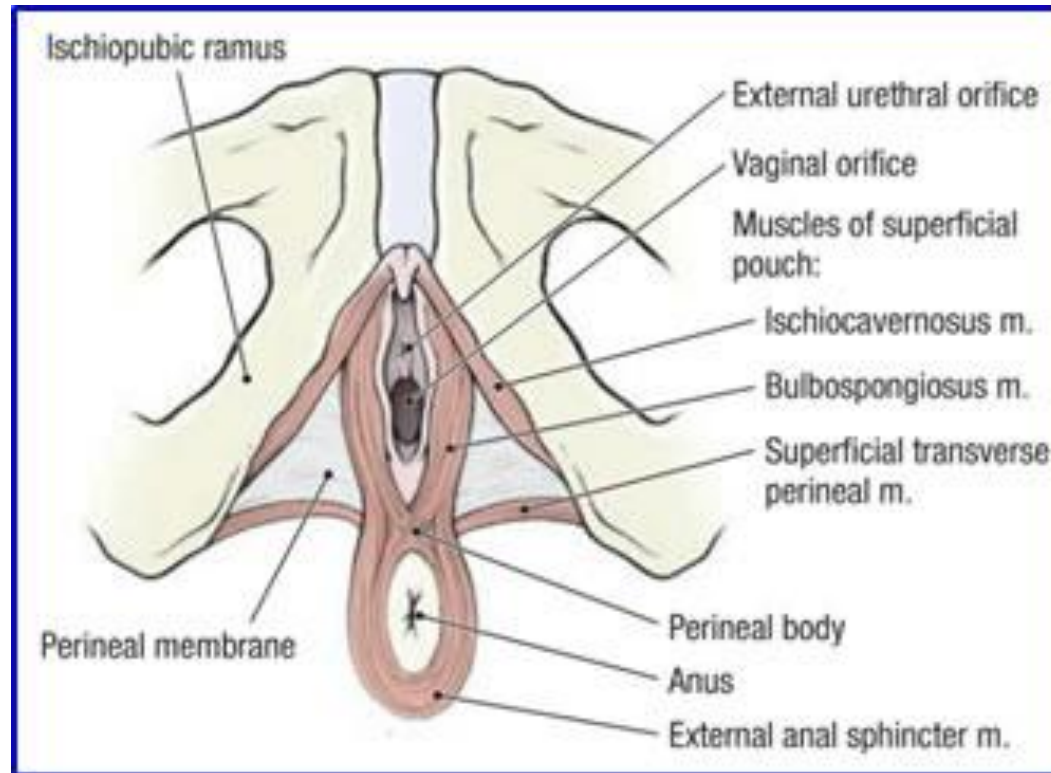


Muscular Supports

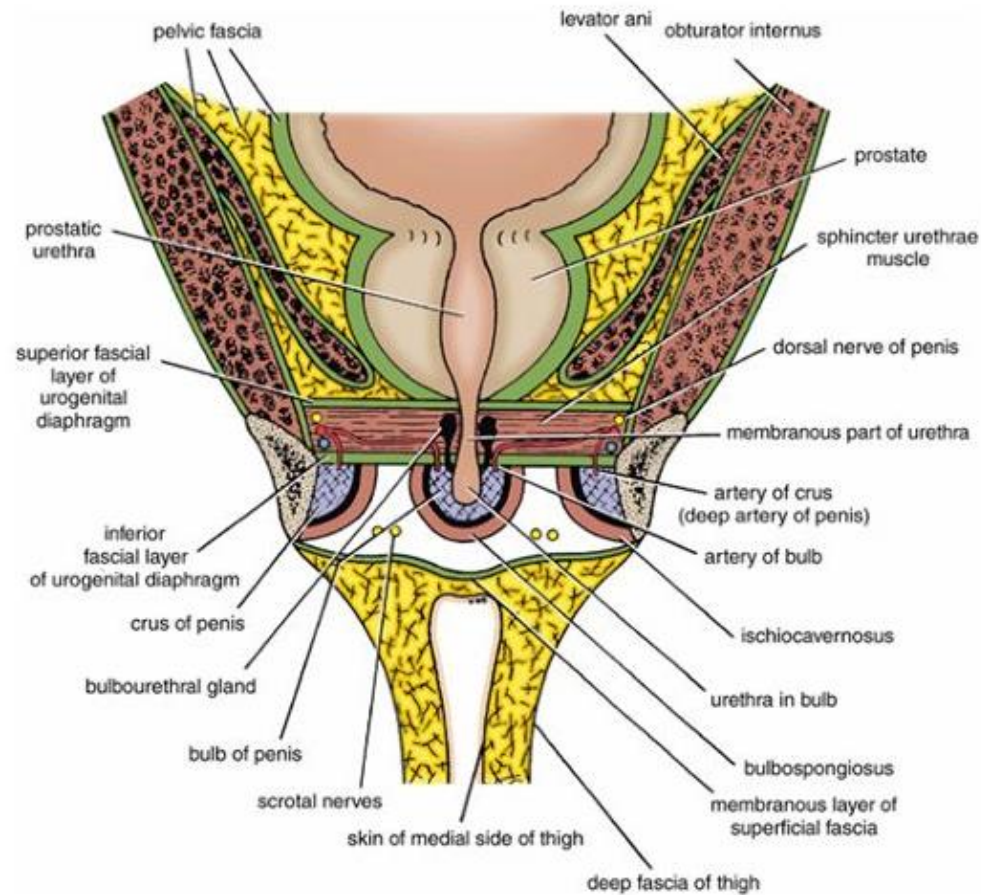
Pelvic Diaphragm



Perineal Body



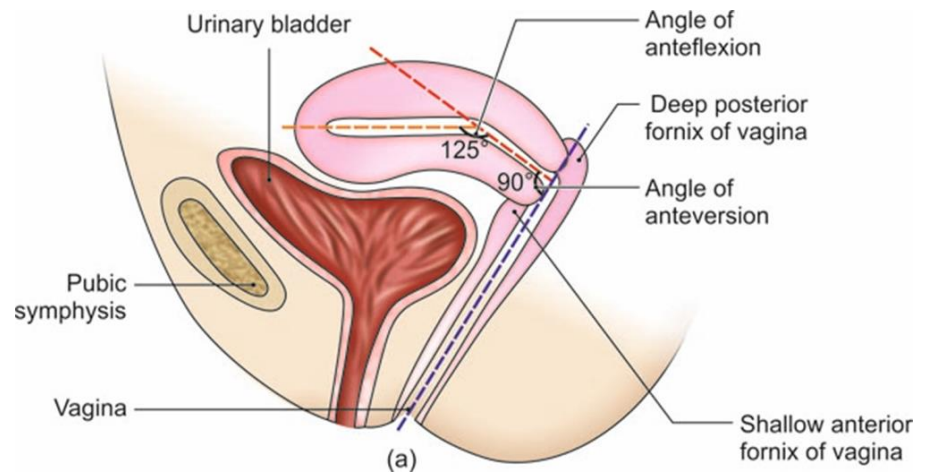
Urogenital Diaphragm



Fibromuscular Supports

Uterine axis

- Normally the uterus is anteverted and anteflexed.
- The anteverted position of uterus prevents the organ from sagging down through the vagina.
- The angle of anteversion (90°) is maintained by the uterosacral and round ligaments.
- Roughly, the long axis of uterus corresponds to the axis of the pelvic inlet.



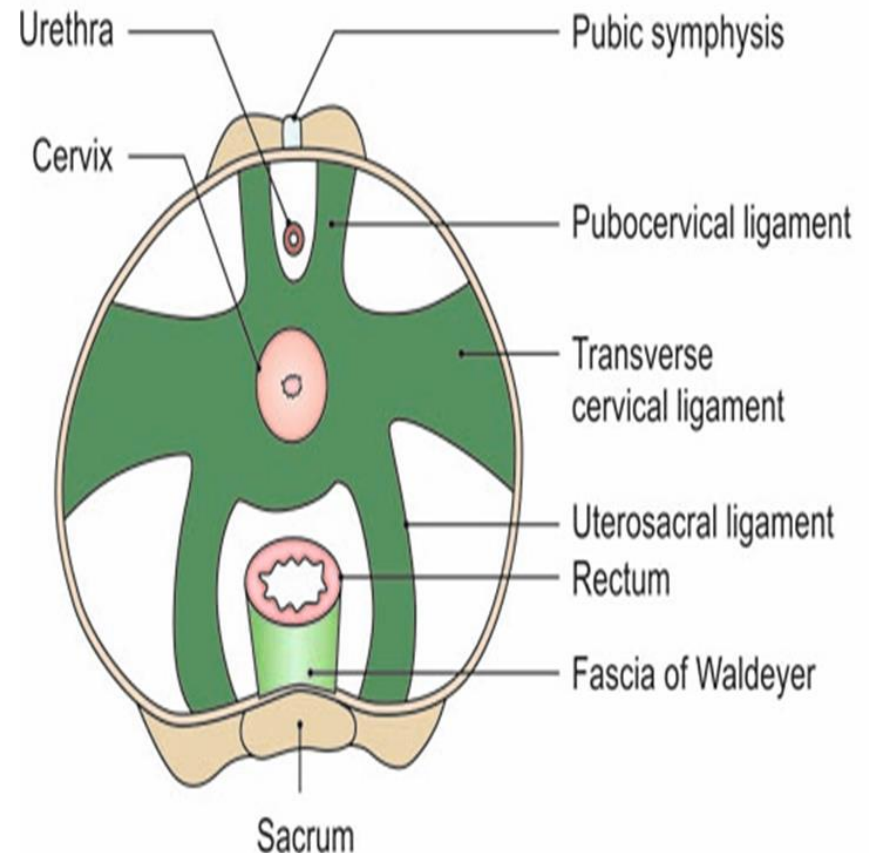
Fibromuscular Supports

Pubocervical ligaments:

- Connect the cervix to the posterior surface of the pubis.
- Derived from the pelvic fascia.
- Pull the cervix forwards and counteract the excessive traction of the uterosacral ligaments.

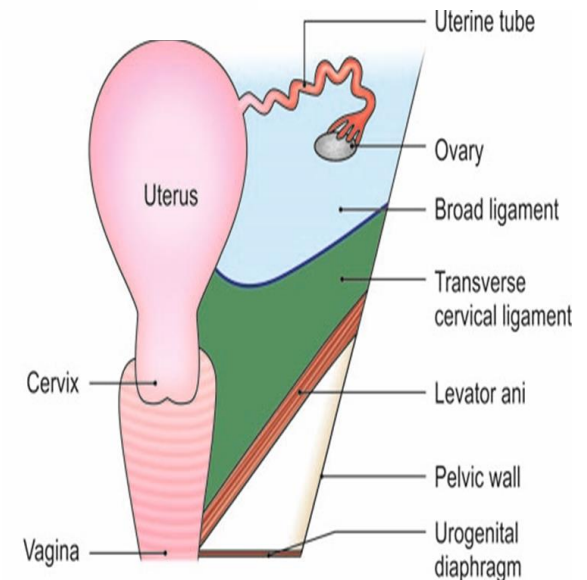
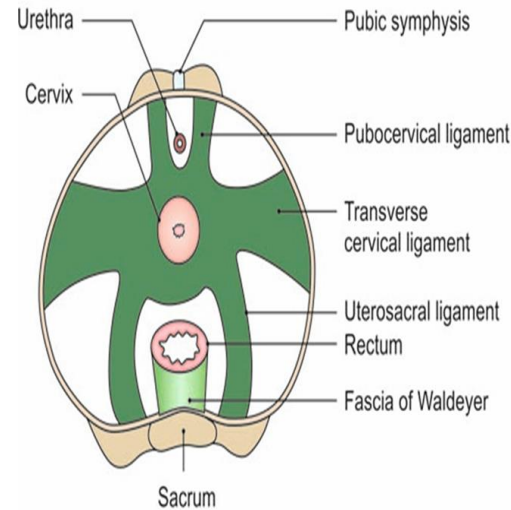
Uterosacral ligaments:

- Connect the cervix to the 3rd sacral vertebra.
- Condensation of the pelvic fascia.
- Enclosed within the rectouterine folds of peritoneum.
- Pull the cervix backwards.
- Helps in maintenance of uterine axis along with the round ligament.



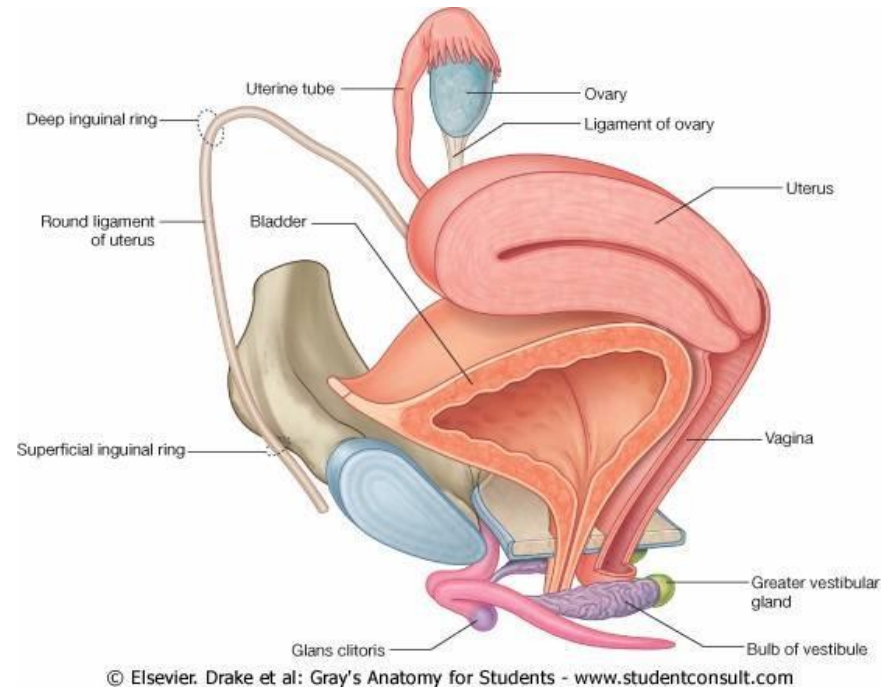
Mackenrodt's ligament

- Also known as **transverse cervical, lateral cervical, paracervical or cardinal ligament/retinacula uteri/sustentaculum of Bonny.**
- Fan-shaped condensation of pelvic fascia.
- Extends laterally from the cervico-vaginal junction to the lateral pelvic wall.
- Related above with the crossing of ureter and uterine artery, and with the lower attached margin of broad ligament.

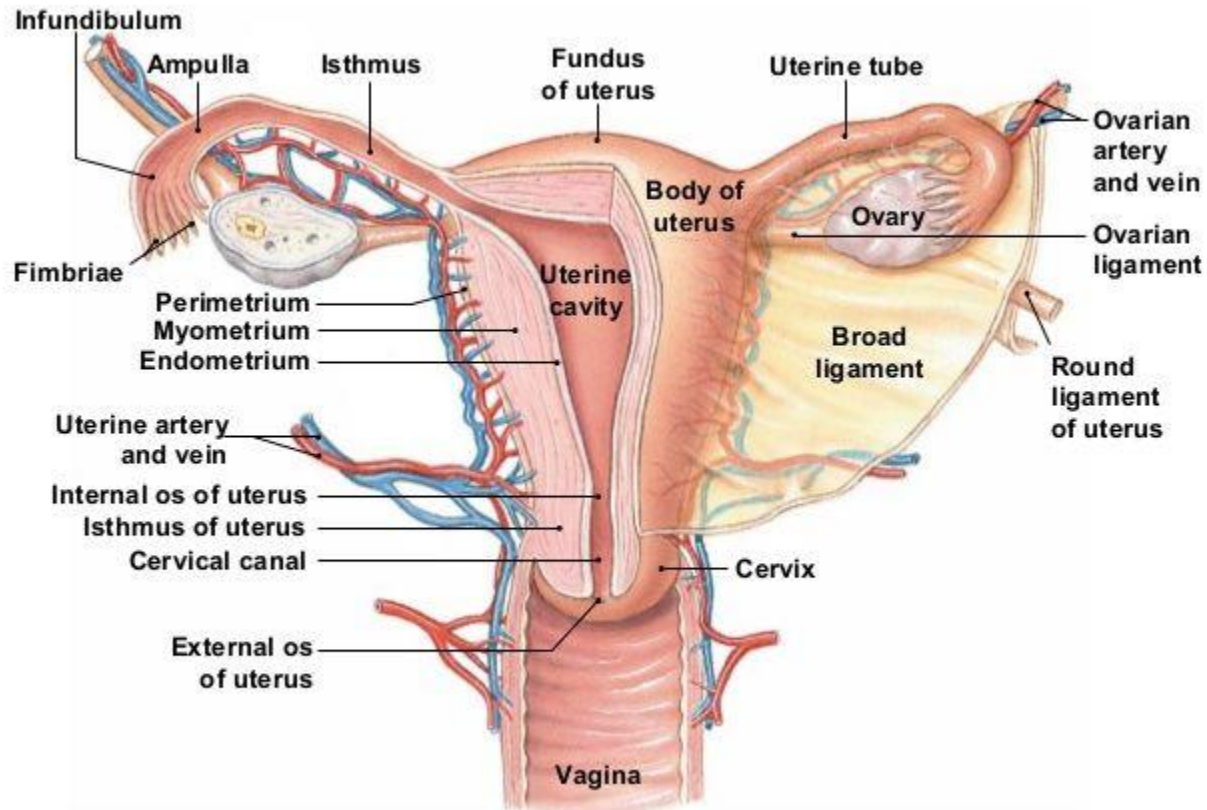


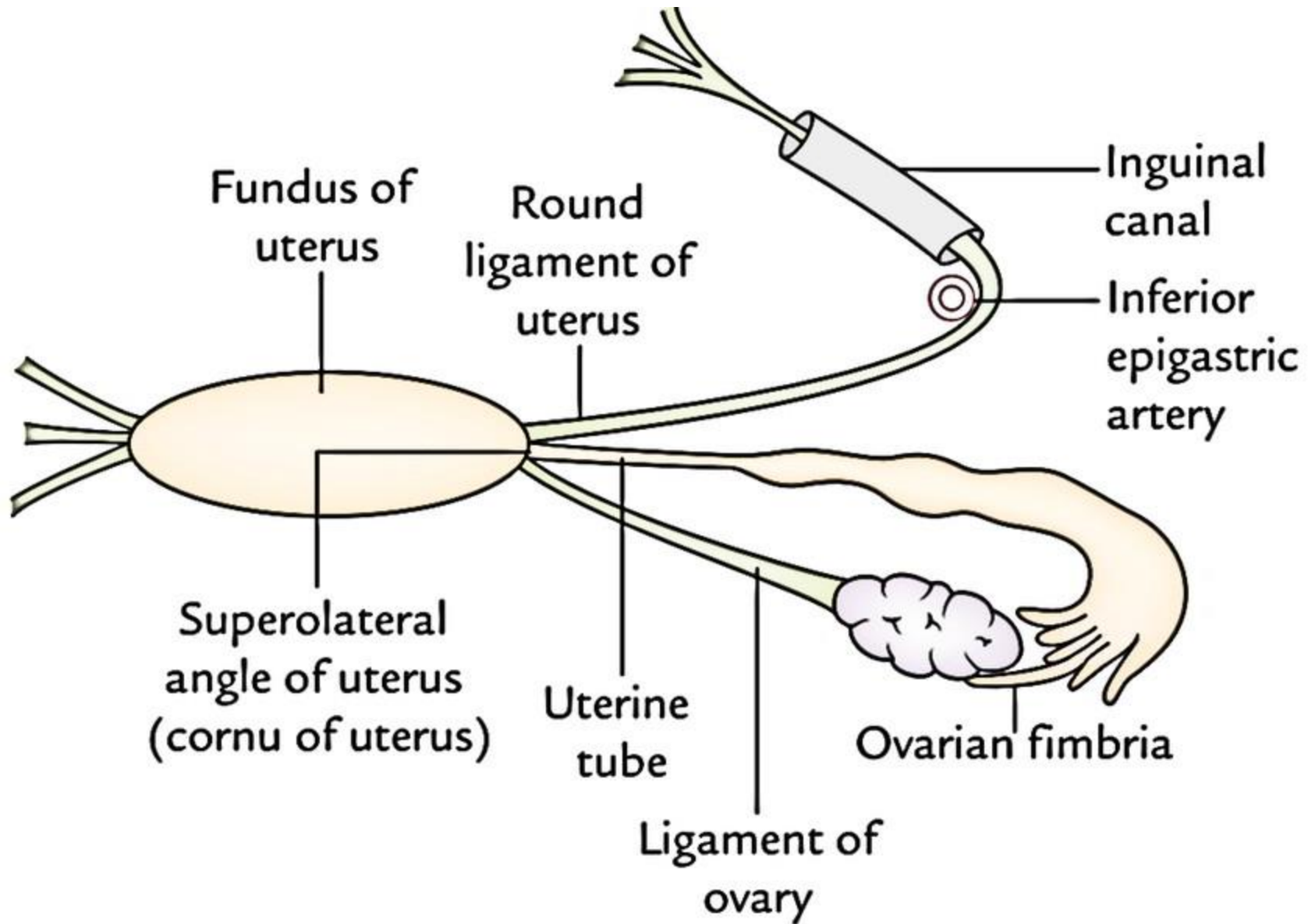
Round ligament of uterus

- Known as ligamentum teres uteri.
- 10-12 cm long.
- Lies b/w 2 layers of broad ligament anteroinferior to the uterine tube.
- Begins at the lateral angle of uterus → Deep inguinal ring → Inguinal canal → splits into thin filaments & merges with the areolar tissue of labium majus.
- Canal of Nuck
- Derivative of gubernaculum of ovary.
- Function: maintains the angle of anteversion.



Round ligament of Uterus





Secondary Supports

- Peritoneal folds which do not provide any support to the uterus.
- Allow mobility of the uterus for the accommodation of the distended bladder and rectum.
- Also known as false ligaments and are classified as:
 - (a) Anterior false ligament (Utero-vesical fold of peritoneum)
 - (b) Posterior false ligament (Recto-vaginal fold of peritoneum)
 - (c) Broad ligaments

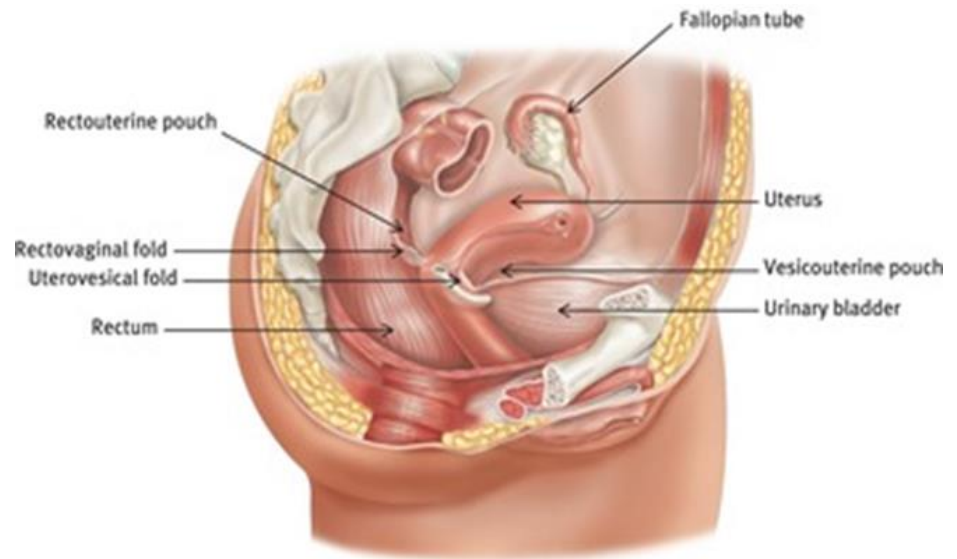
Secondary Supports

Utero-vesical fold:

- Formed by the reflection of peritoneum from the anterior surface of the body of uterus to the upper surface of the urinary bladder at the level of isthmus.

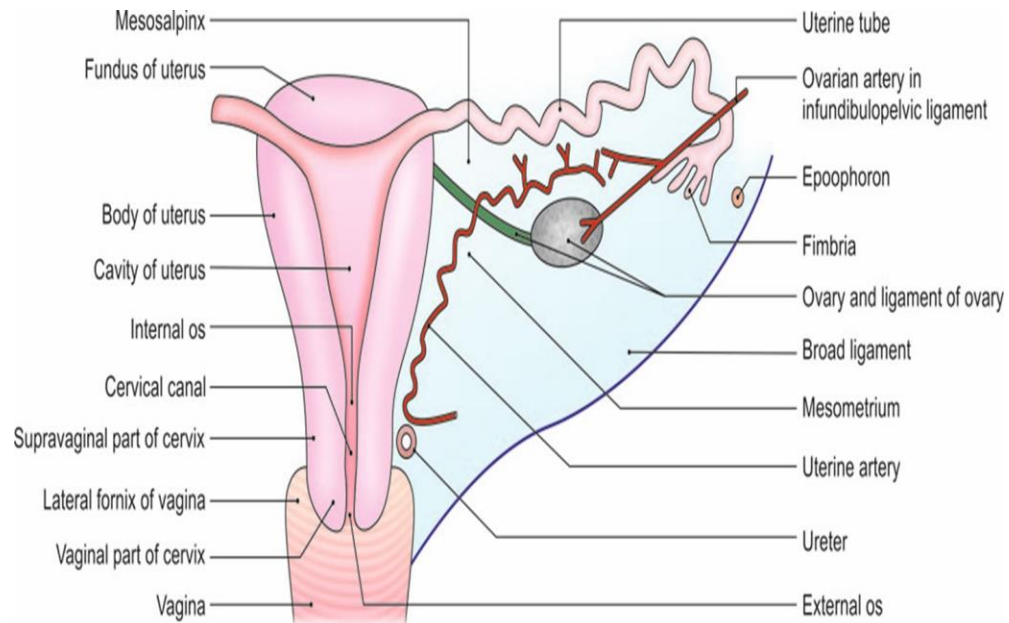
Recto-vaginal fold:

- Formed by the peritoneal reflection from the posterior fornix of the vagina to the rectum.
- This fold forms the pouch of Douglas.



Broad ligament

- 2 broad folds of peritoneum which suspend the uterus to the lateral pelvic wall.
- Both broad ligaments and uterus form a transverse partition which divides the pelvic cavity into an anterior compartment for the bladder, and a posterior compartment for the sigmoid colon and rectum.
- Surfaces- anterior and posterior.
- Borders- upper, lower, medial and lateral.



Broad ligament

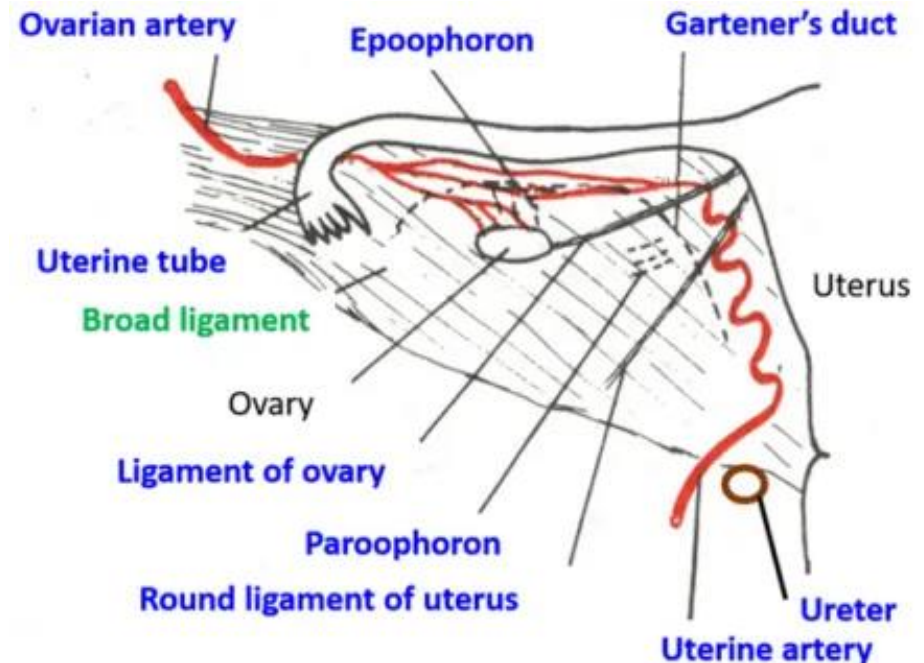
Subdivisions:

- 1. Mesosalpinx:** intervenes b/w the uterine tube and ovary with the ligament of ovary. Contains the uterine tube and the anastomosis b/w the uterine & ovarian vessels.
- 2. Mesometrium:** from the ovary and its ligament to the base of the broad ligament. Contains the tortuous uterine vessels.
- 3. Infundibulopelvic ligament (Suspensory ligament of ovary):**
Connects the ovary and the uterine tube to the pelvic brim across the external iliac vessels. Transmits the ovarian vessels and nerves.
- 4. Mesovarium:** a fold derived from the posterior layer of the broad ligament where the ovary is attached. Transmits the ovarian vessels and nerves.



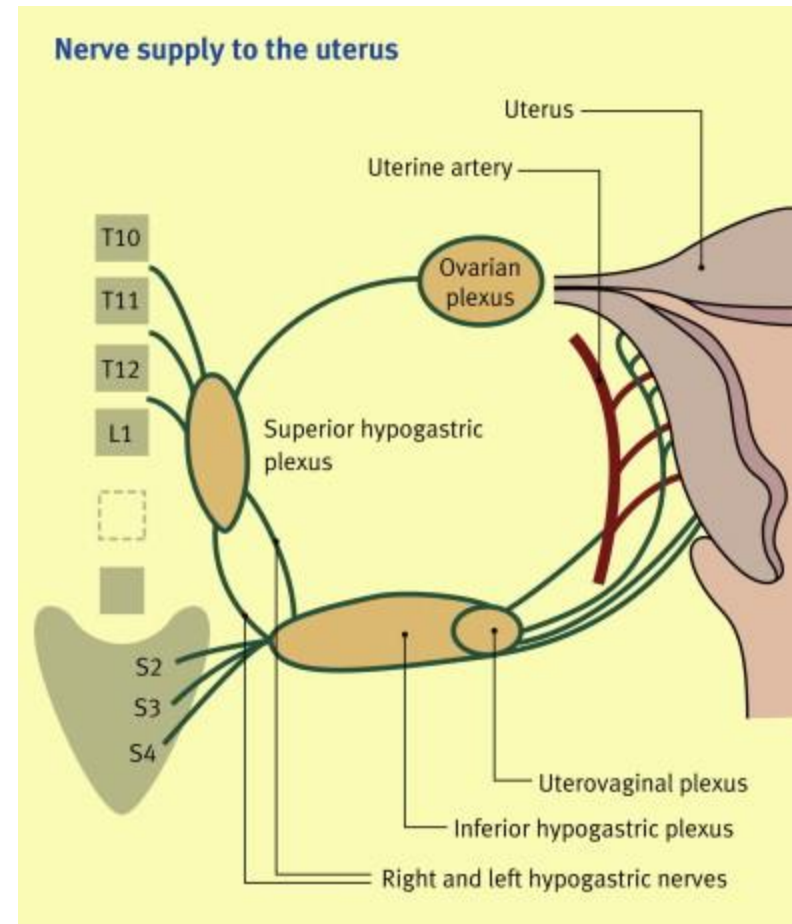
Contents of the Broad ligament

- **One tube:** Uterine tube in the free upper border.
- **Two ligaments:** (a) Round ligament of uterus
(b) Ligament of ovary
- **Two vessels:** (a) Uterine vessels
(b) Ovarian vessels
- **Two nerves:** (a) Uterovaginal plexus
(b) Ovarian plexus
- **Two embryological remnants:**
(a) Epoophoron and the duct of epoophoron (Gartner's duct)
(b) Paroophoron
- **Two miscellaneous structures:**
(a) Lymphatics and lymph nodes
(b) Fibroareolar tissue or parametrium

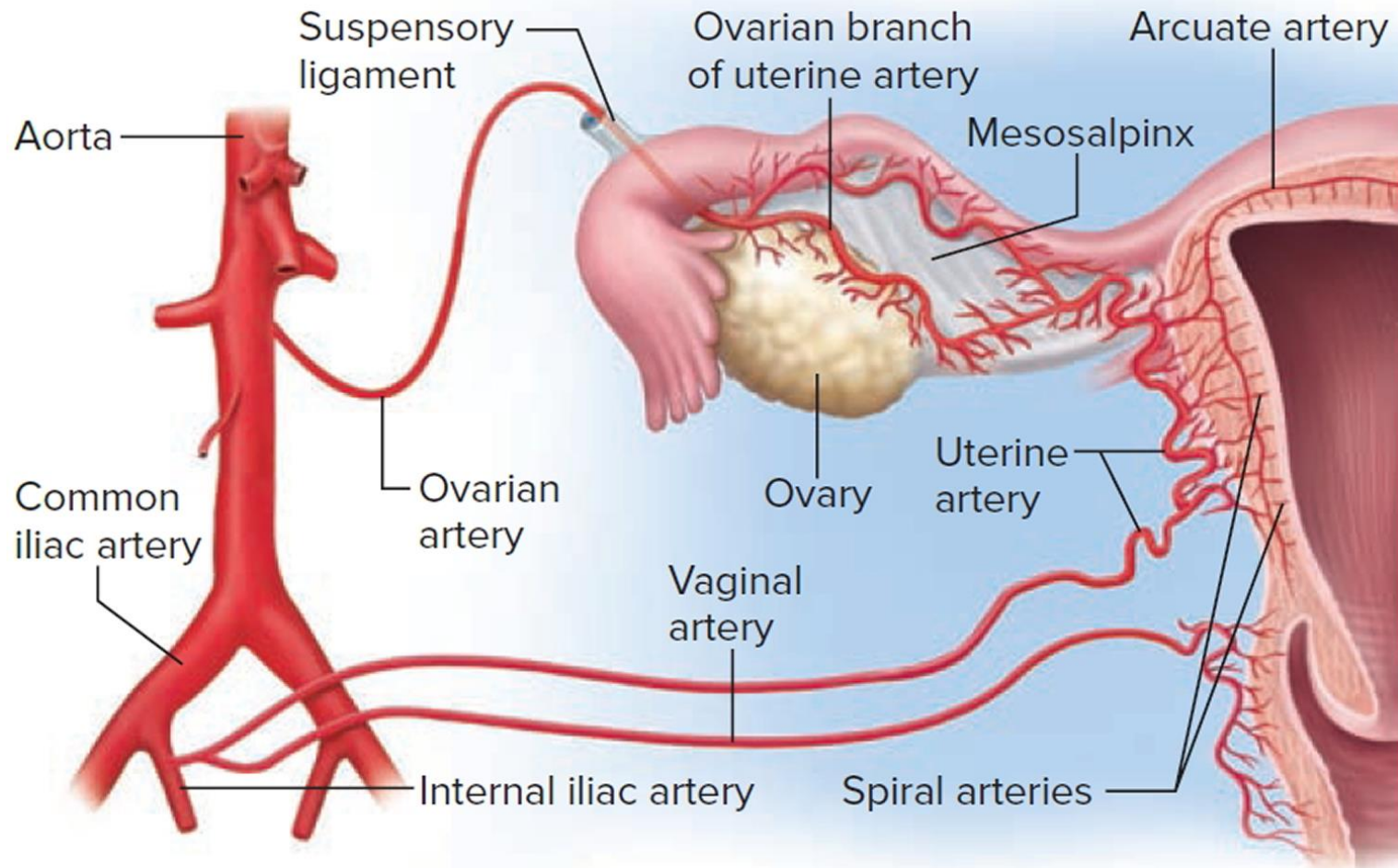


Nerve Supply of Uterus

- Both sympathetic and parasympathetic nerves through the inferior hypogastric and ovarian plexuses.
- Sympathetic nerves (T12,L1): uterine contraction and vasoconstriction.
- Parasympathetic nerves (S2,3,4): uterine inhibition and vasodilatation.
- Pain sensations from the body of uterus: sympathetic nerves.
- Pain sensations from the cervix: parasympathetic nerves.



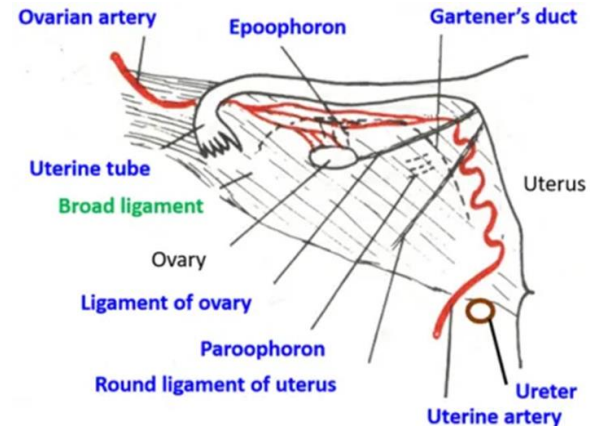
Arterial supply of Uterus



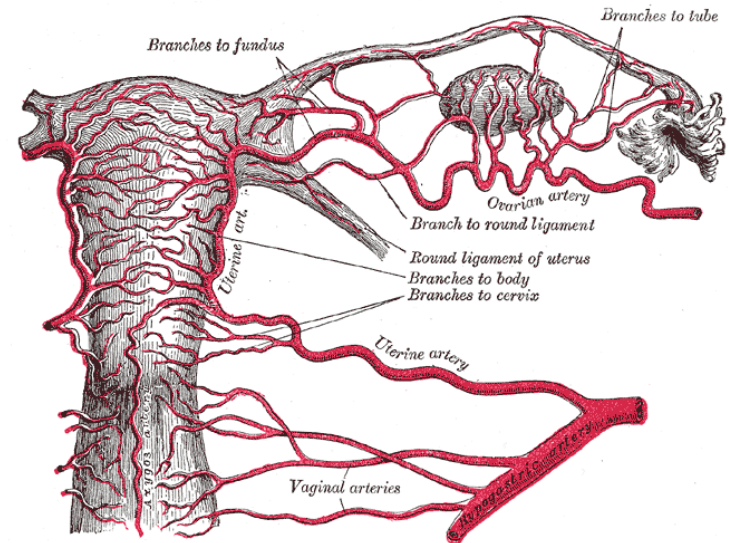
Uterine arteries

Course:

- Runs medially towards the cervix, crossing the ureter above the lateral fornix of vagina from lateral to medial side.
- Crossing lies 2 cm lateral to cervix and above the Mackenrodt's ligament.
- Runs upwards through the broad ligament along the lateral border of uterus with a tortuous course.

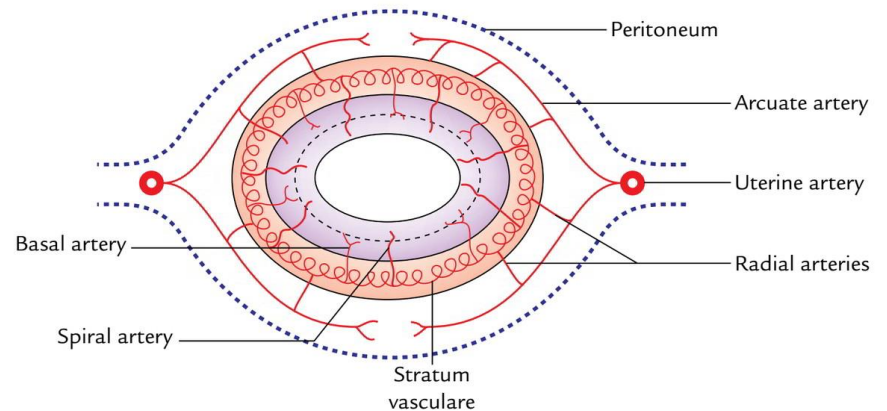


<https://anatomyqa.com/uterus-anatomy/>



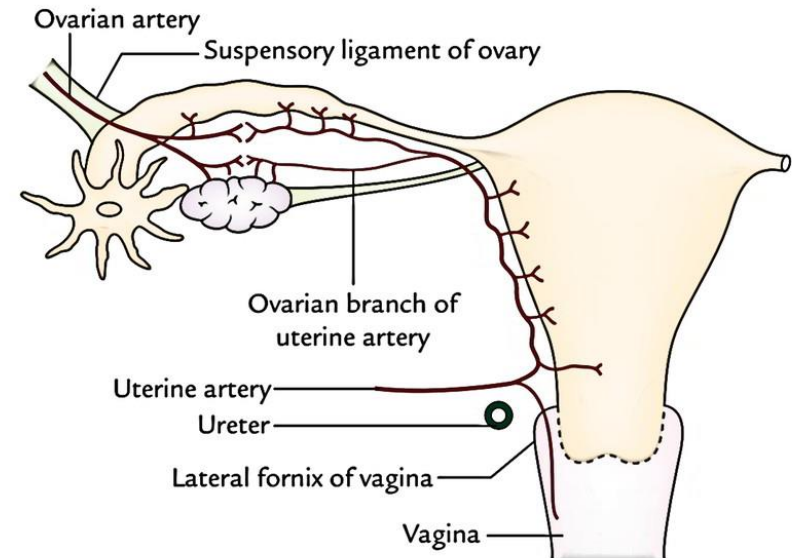
Uterine arteries (contd...)

- As the uterine artery ascends it gives arcuate (coronary) branches.
- Numerous radial arteries arise from the arcuate arteries.
- Radial arteries pierce the myometrium centripetally to form **stratum vasculare**.
- Branches from stratum vasculare:
 - (i) Basal branches
 - (ii) Spiral branches



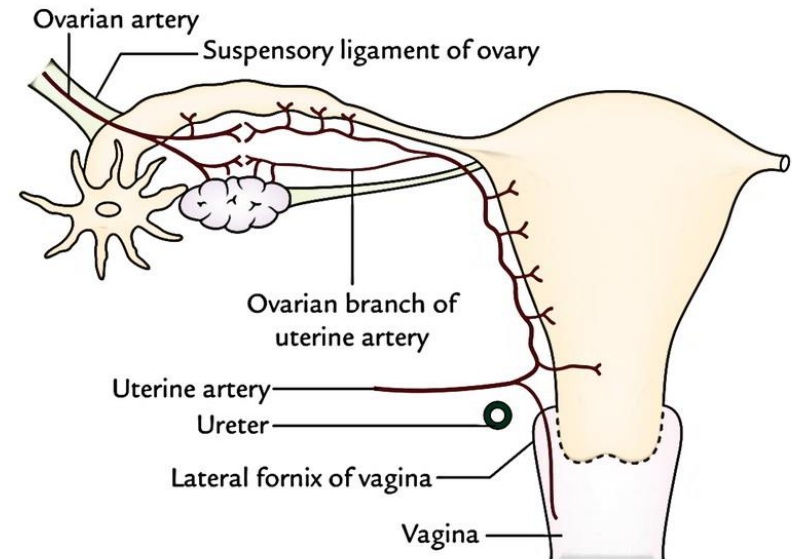
Uterine arteries (contd...)

- Finally, the uterine artery runs laterally towards the hilus of the ovary, and ends by anastomosing with the ovarian artery.
- Tortuosity permits expansion of the uterus during pregnancy.



Areas of supply

- Uterus
- Vagina
- Medial 2/3rd of uterine tube
- Ovary
- Ureter
- Contents of the broad ligament



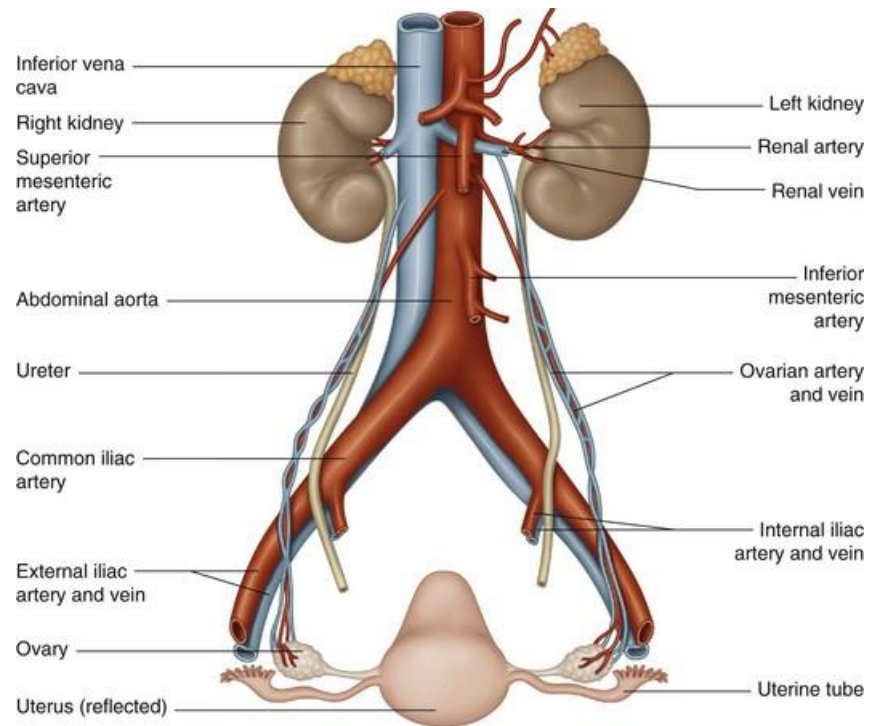
Ovarian arteries

Origin:

- From the front of the aorta.
- A little below the renal arteries.

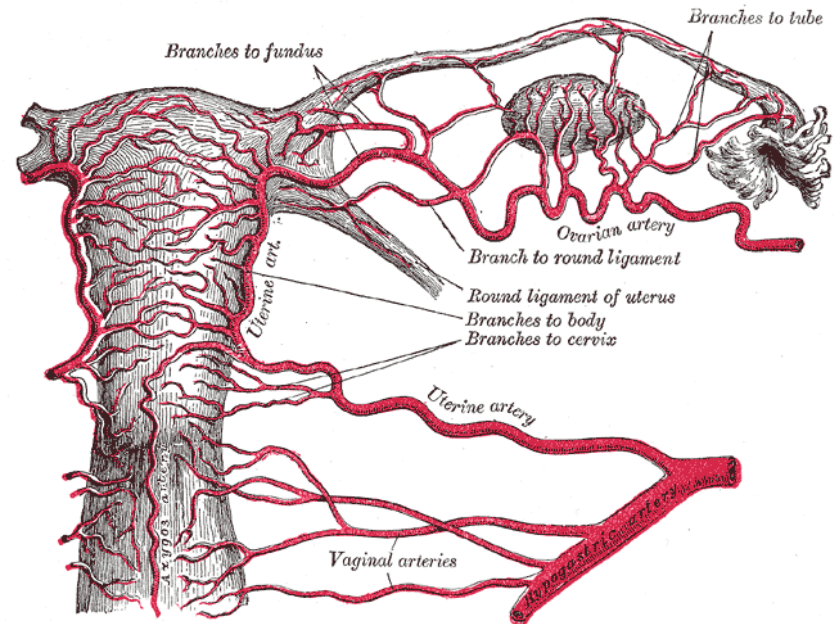
Abdominal Course:

- Passes obliquely downwards and laterally in front of the psoas major, ureters and genitofemoral nerves.



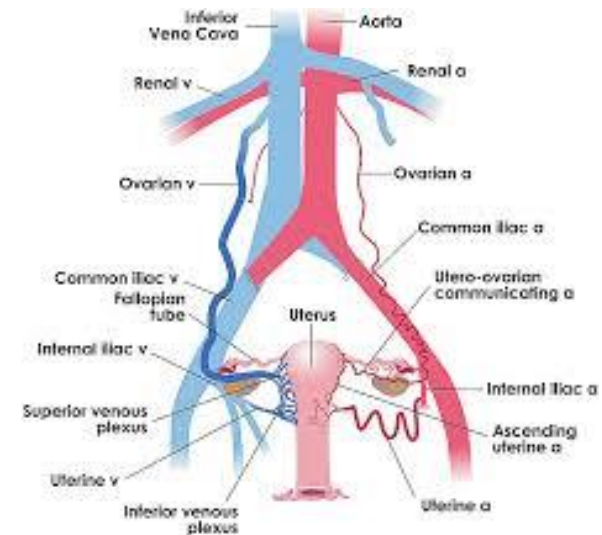
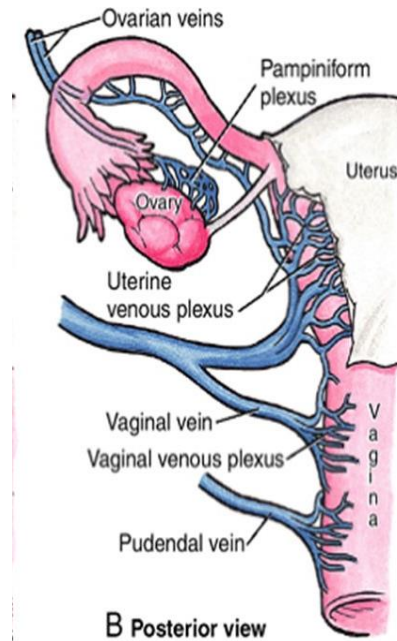
Areas of supply

- Uterine tube
- Pelvic part of ureter
- Uterus
- Ovary



Venous drainage of Uterus

- Veins form a plexus along the lateral border of the uterus.
- Through the uterine, ovarian and vaginal veins the plexus drains into the internal iliac vein.



<https://slideplayer.com/slide/2792973/>

https://www.glowm.com/pdf/PPH_2nd_edn_Chap-22.pdf

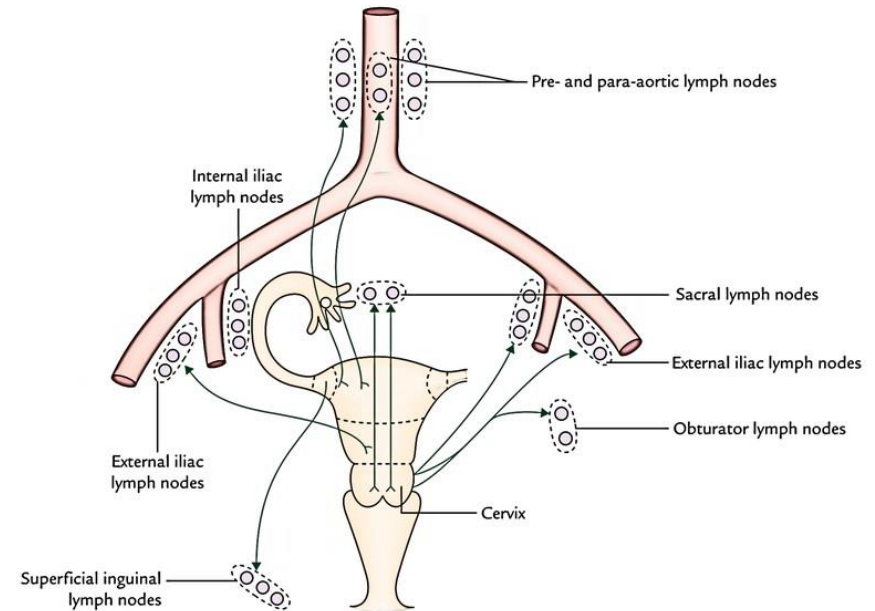
Lymphatic drainage of Uterus

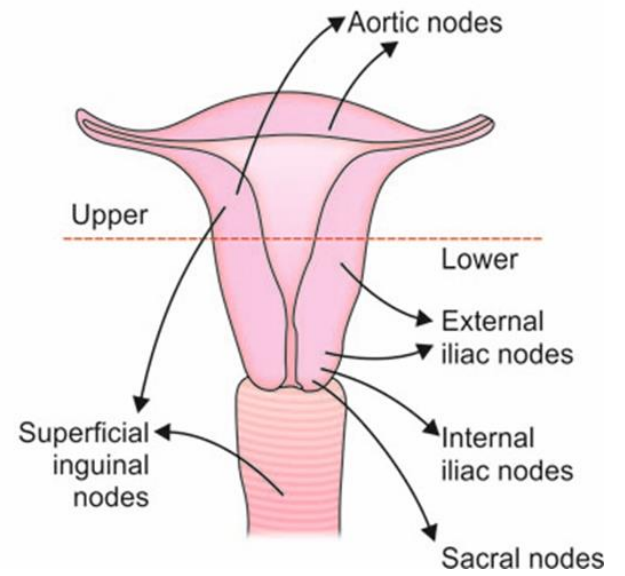
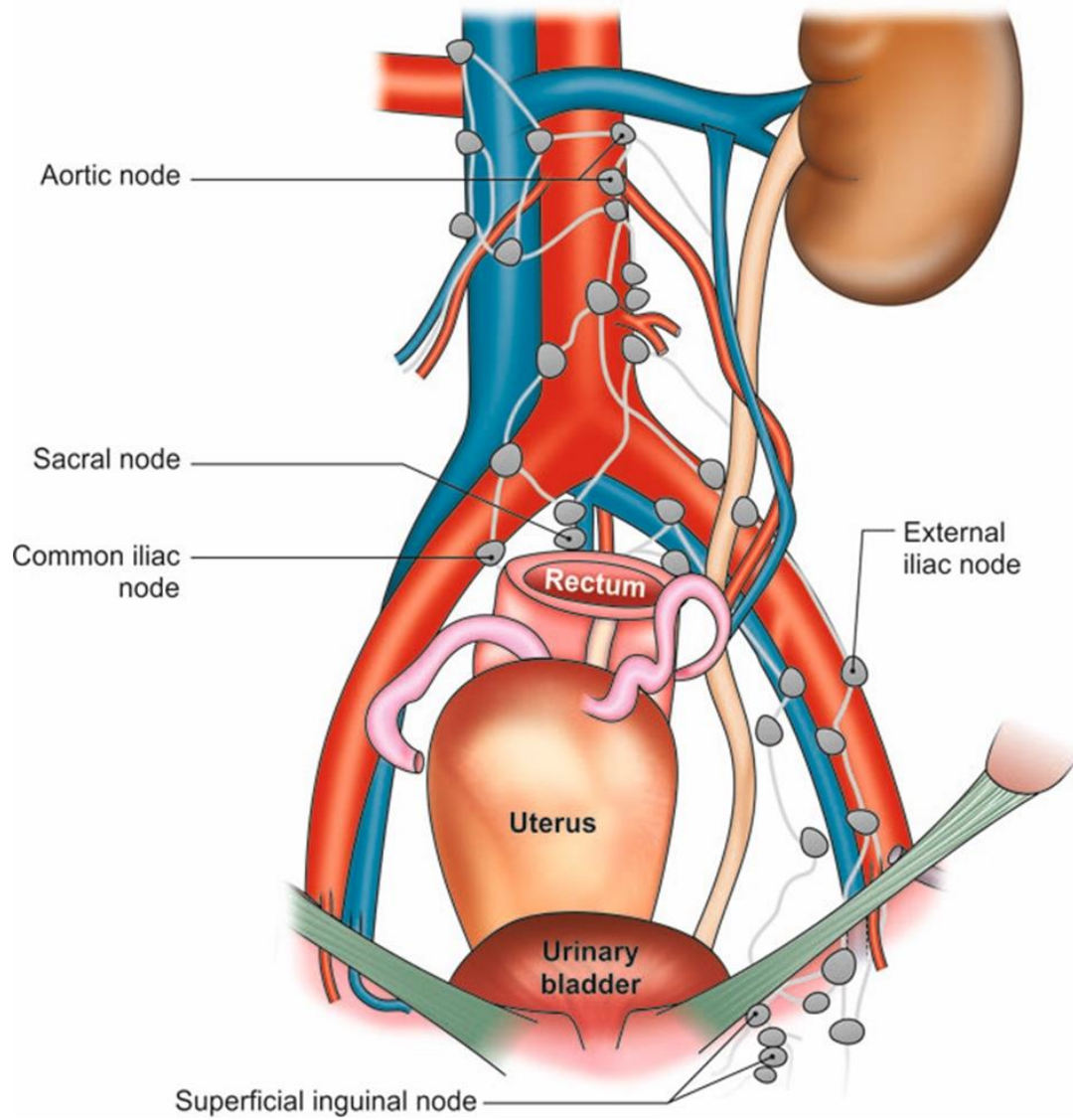
3 intercommunicating networks:

- Endometrial
- Myometrial
- Subperitoneal

These plexuses drain into the lymphatics on the side of the uterus:

- Upper lymphatics (from fundus & upper part of body) → Aortic nodes and superficial inguinal nodes.
- Middle lymphatics (from lower part of body) → External iliac nodes.
- Lower lymphatics (from cervix) → External iliac, internal iliac and sacral nodes.



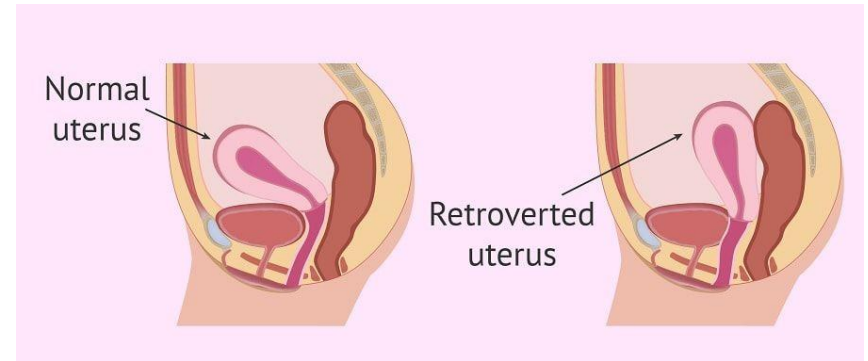


Age and Reproductive Changes

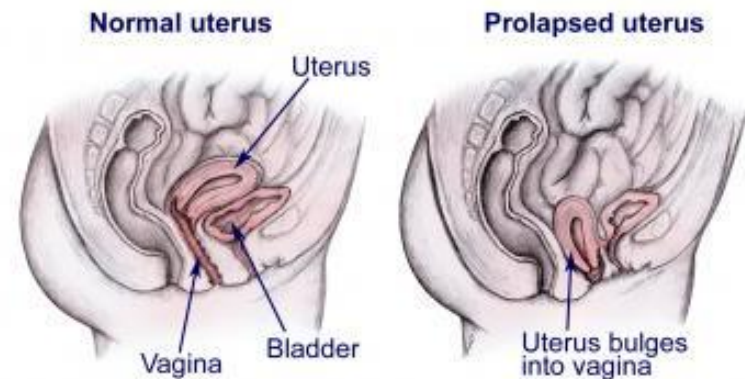
- **In foetal life:** cervix is more elongated than the body of uterus.
- **At puberty:** uterus enlarges and arbor vitae uteri appear.
- **During menstruation:** uterus is slightly enlarged and more vascular. The lips of the external os is swollen.
- **During pregnancy:** uterus is enormously enlarged (hypertrophy and hyperplasia). Uterine walls become thinner. After parturition the uterus gradually involutes and returns to the nonpregnant size.
- **In old age:** uterus becomes smaller in size. Internal and external os are frequently obliterated.

Applied Anatomy

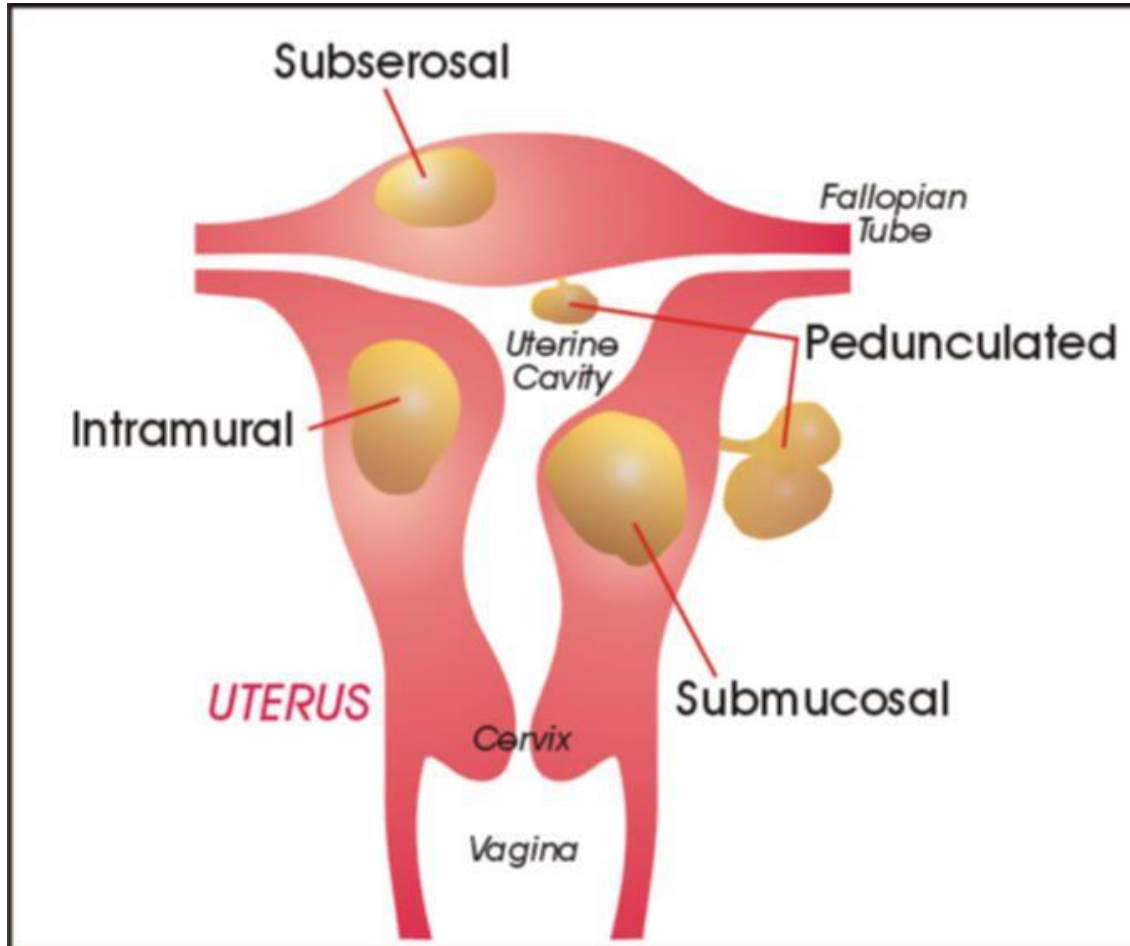
- Retroverted uterus
- Prolapse of uterus
- Endometritis
- Cervicitis
- Fibromyoma
- Cancer cervix
- Caesarean section
- Hysterectomy, hysterotomy, hysteropexy, hysterosalpingography



<https://www.pinterest.com/pin/8514686779215780/>



Fibromyoma



Thank You