INTRODUCTION

-The female reproductive system consists of the lower genital tract i.e Vulva and Vagina.

-And the upper genital tract which consists of

1)Uterus and cervix

2) Uterine(fallopian) tubes

3)Ovaries

OVARIES

-In the adult, non-pregnant state, the ovaries lie on each side of the uterus close to the lateral pelvic wall, suspended in the pelvic cavity by a double fold of peritoneum, the mesovarium, which is attached to the upper limit of the posterior aspect of the broad uterine ligament.

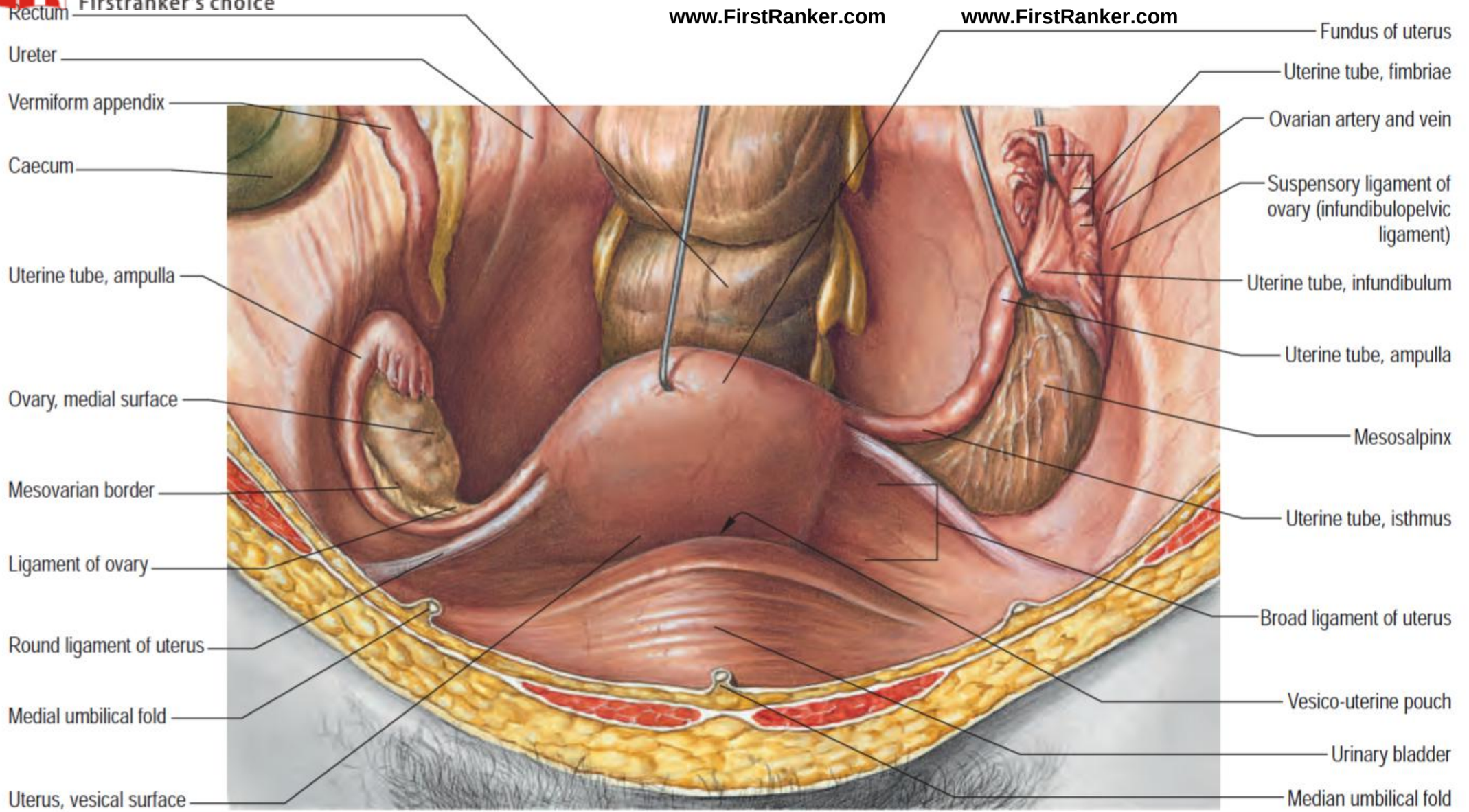
-They are dull white in colour and consist of dense fibrous tissue, in which ova are embedded.

-Before regular ovulation begins, they have a smooth surface but, thereafter, their surfaces are distorted by scarring that follows the degeneration of successive corpora lutea.

-Their average dimensions are 4 × 2 × 1 cm in reproductively mature women; they become more than double their size during pregnancy.

-In the neonate, their dimensions are 1.3 × 0.6 × 0.4 cm.

-Prior to the first menstrual period (menarche), the ovaries are about one-third of the normal reproductive adult size; they gradually increase in size with body growth and decrease significantly after the menopause.



LOCATION

-In nulliparous adult women,each ovary lies in the ovarian fossa on the lateral pelvic wall below the pelvic brim.

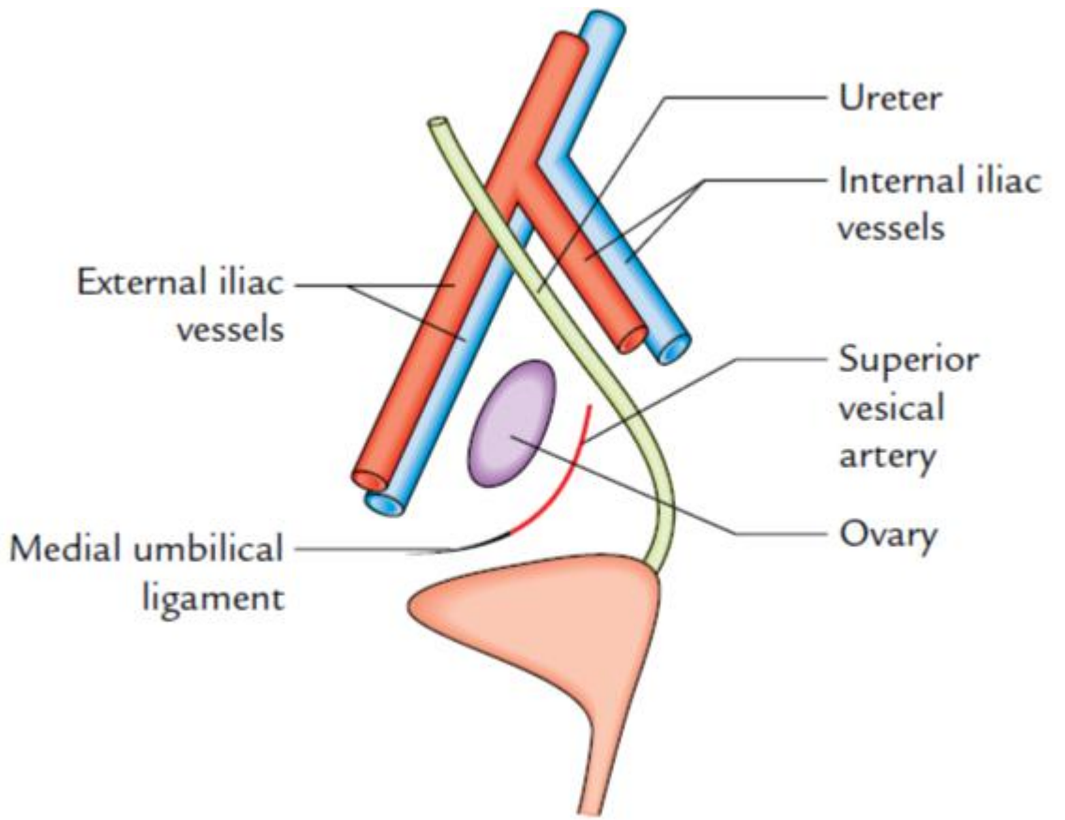
-The ovarian fossa is a slight peritoneal depression bounded;

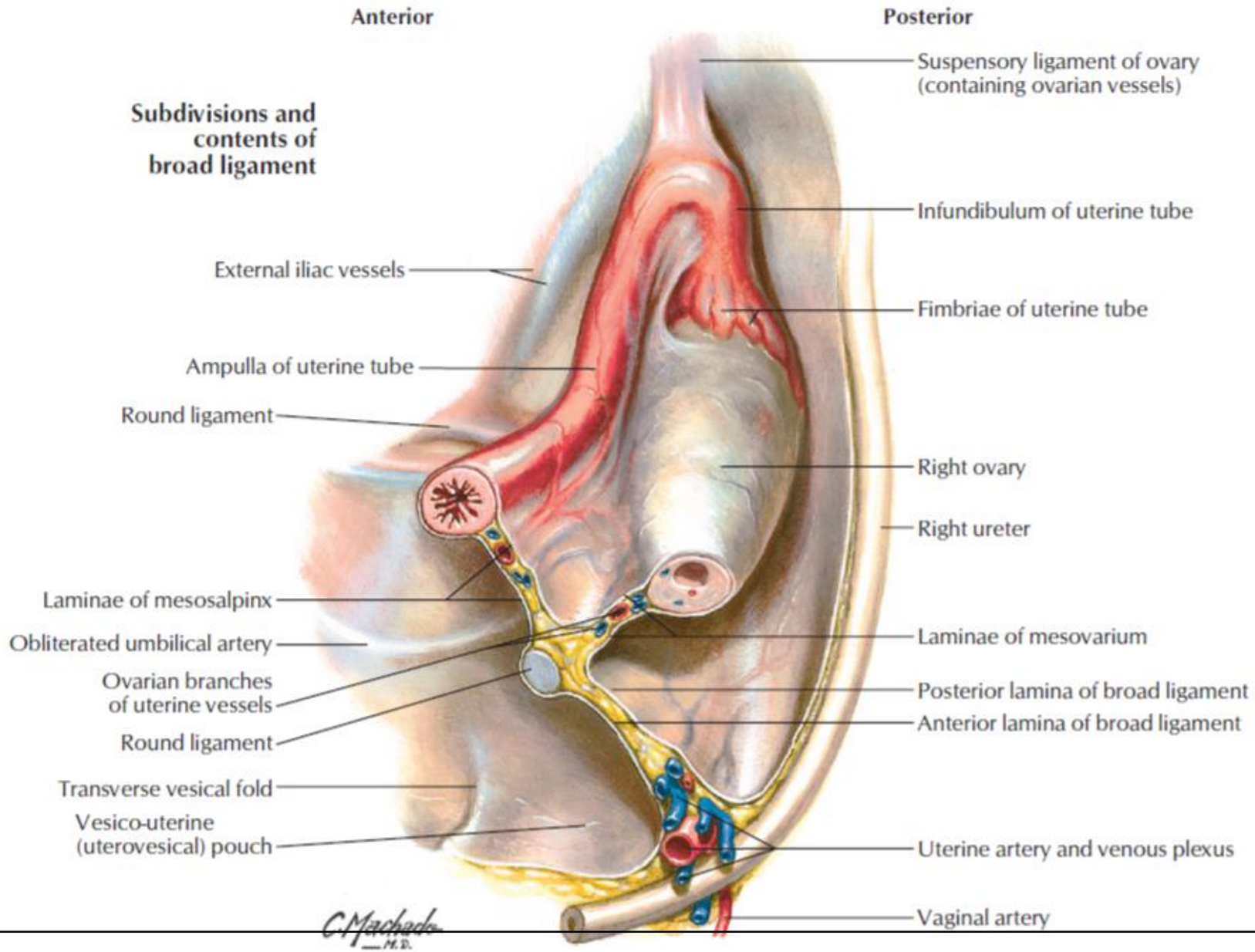
Posteriorly by the ureter and internal iliac vessels.

Anteriorly by the external iliac vessels.

Inferiorly by the uterine tubes

-The floor of the fossa is crossed by obturator nerve and vessels.





External features and relations of ovary

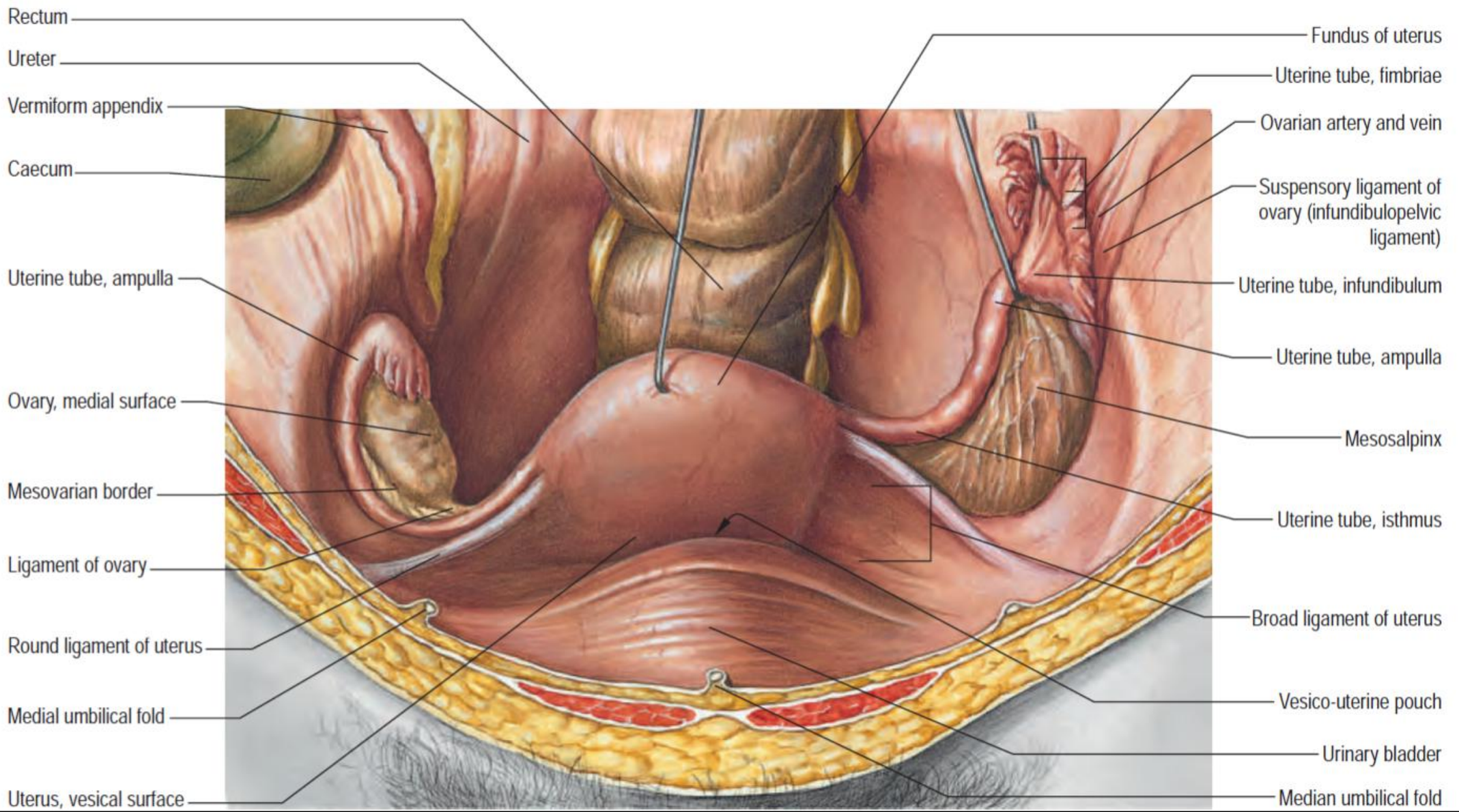
-In nulliparous,the anatomical position of the long axis of ovary is almost vertical(whereas in multiparous it is horizontal)

-External features:-

1)Two extremities or poles

2)Two surfaces

3)Two borders



1)Superior extremity

-It is broader and provides attachment to a fold of peritoneum called as suspensory ligament of ovary which contains ovarian vessels and nerves.

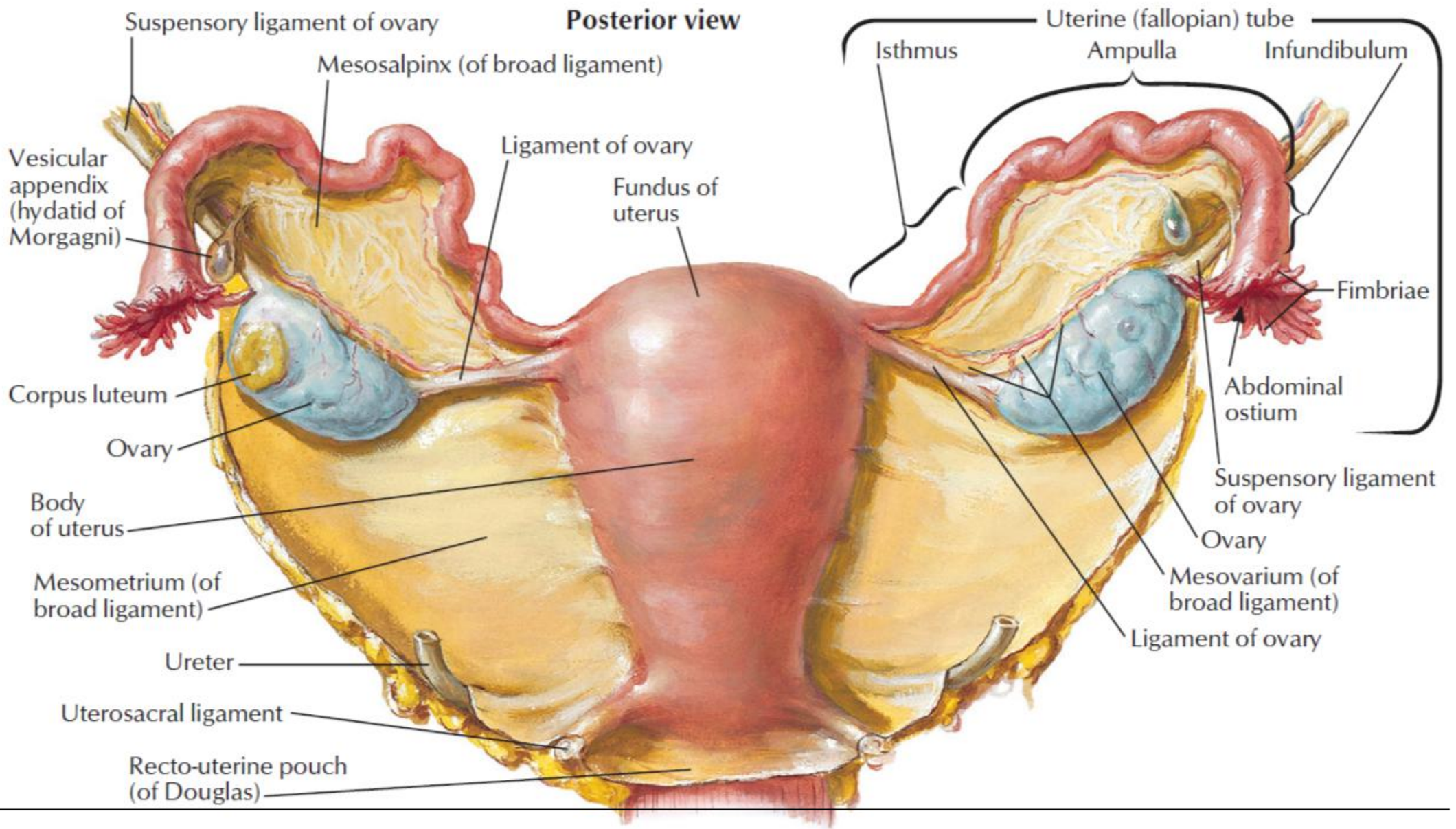
-Above the superior extremity are the fimbria and distal section of the uterine tube.

-It is also related to external iliac vein.

2)Inferior extremity

-It is narrower and points downwards towards the pelvic floor.

-It is connected to the lateral angle of the uterus posteroinferior to the attachment of fallopian tube by the ligament of ovary.



1)Lateral surface

-The lateral surface of the ovary contacts parietal peritoneum in the ovarian fossa.

-Behind the ovarian fossa are retroperitoneal structures, including the ureter, internal iliac vessels, obturator vessels and nerve, and the origin of the uterine artery .

2)Medial surface

-The medial surface faces the uterus and uterine vessels in the broad ligament, and the peritoneal recess here is termed the ovarian bursa.

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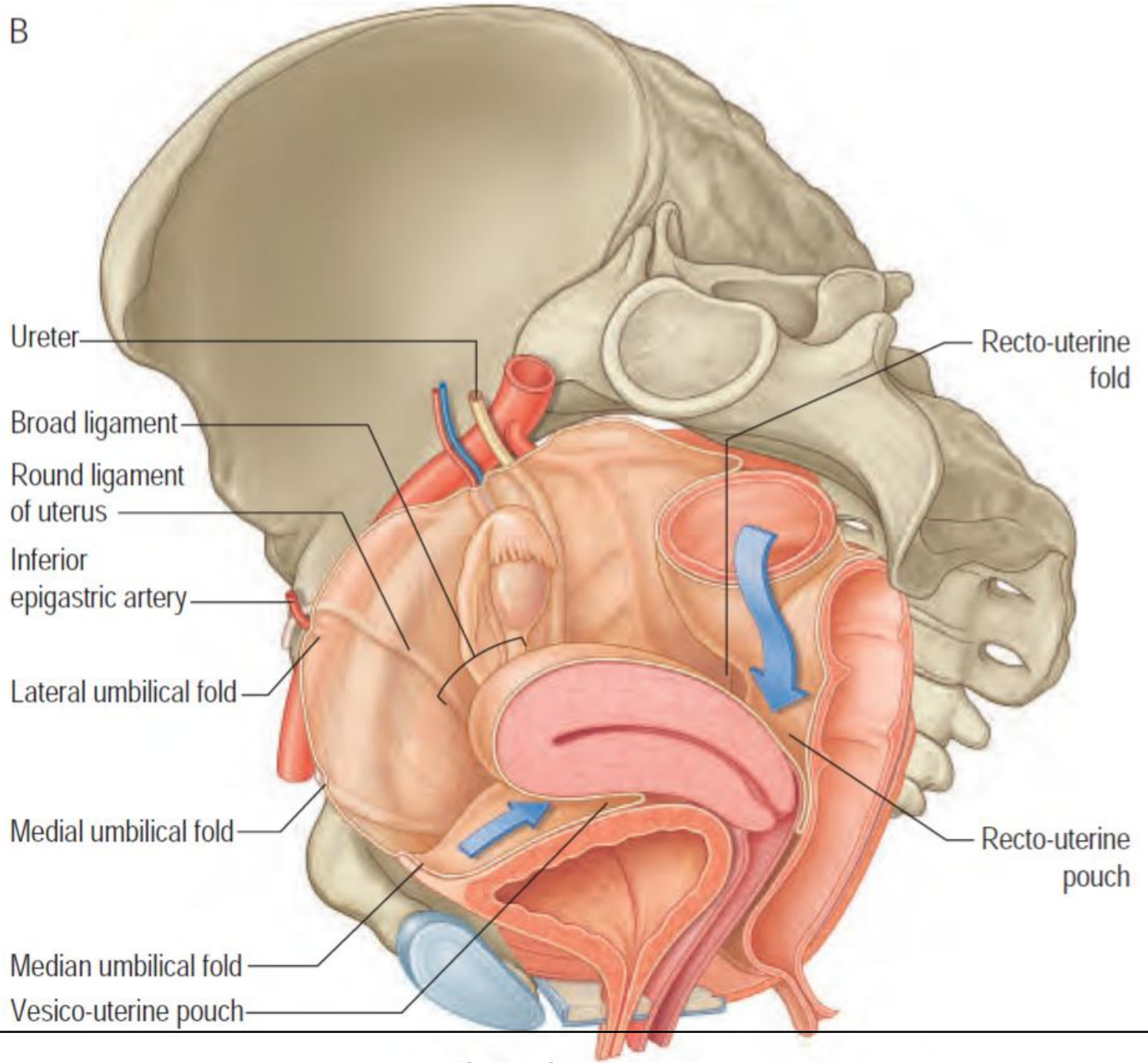
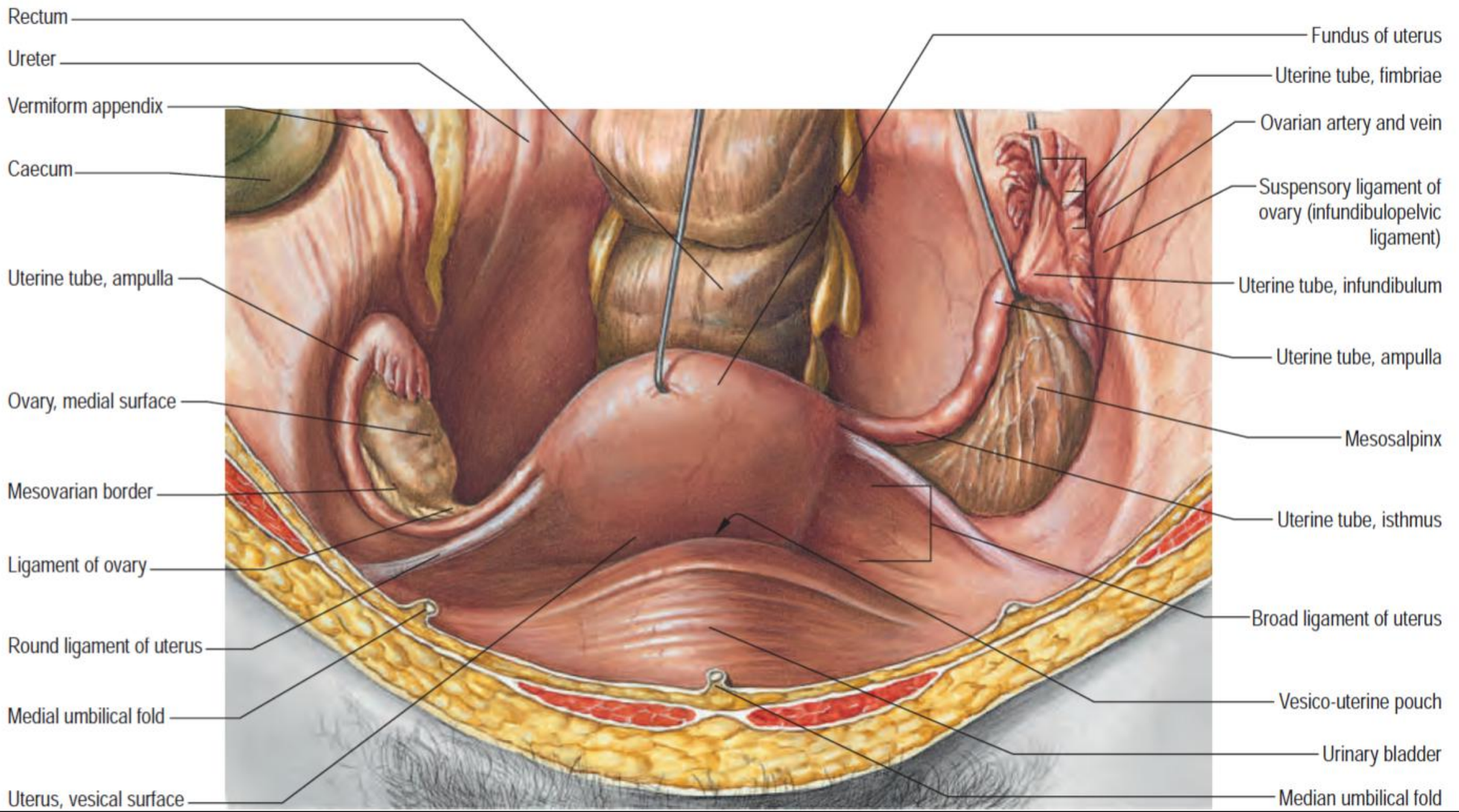


1)Anterior(mesovarian) border

-It is straight and attached to the posterior layer of broad ligament by a short fold of peritoneum called mesovarium.

2)Posterior(free) border

- The posterior border is free and faces the peritoneum, which overlies the upper part of the internal iliac artery and vein, and the ureter.

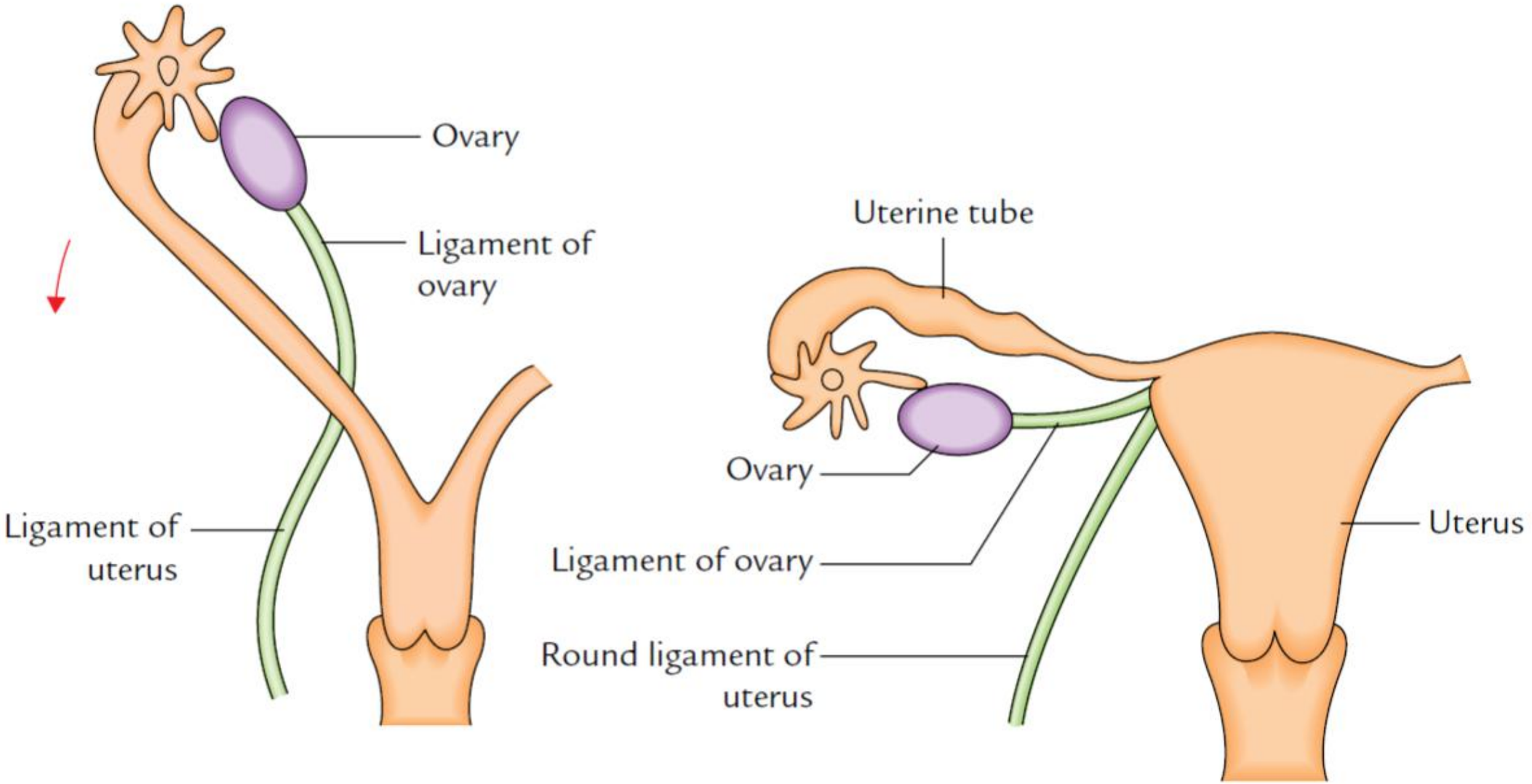


-In embryonic and early fetal life, the ovaries are situated in the lumbar region near the kidneys. They gradually descend along the gubernaculum, stopping at the lesser pelvis.

-In girls, the ovaries lie at or below the iliac crest, just medial to the anterior superior iliac spine, and above the pubic symphysis at all ages.

-Accessory ovarian tissue may occur in the mesovarium or along the course of the gubernacula;rarely, the ovaries may descend along the whole course of the gubernacular and are found in the labia majora.

-During pregnancy, the ovaries are lifted high in the pelvis; by 14 weeks of gestation, they become partly abdominal structures, and by the third trimester, they are totally abdominal structures and lie vertically behind and lateral to the parous uterus.



Peritoneal and ligamentous supports of the ovary

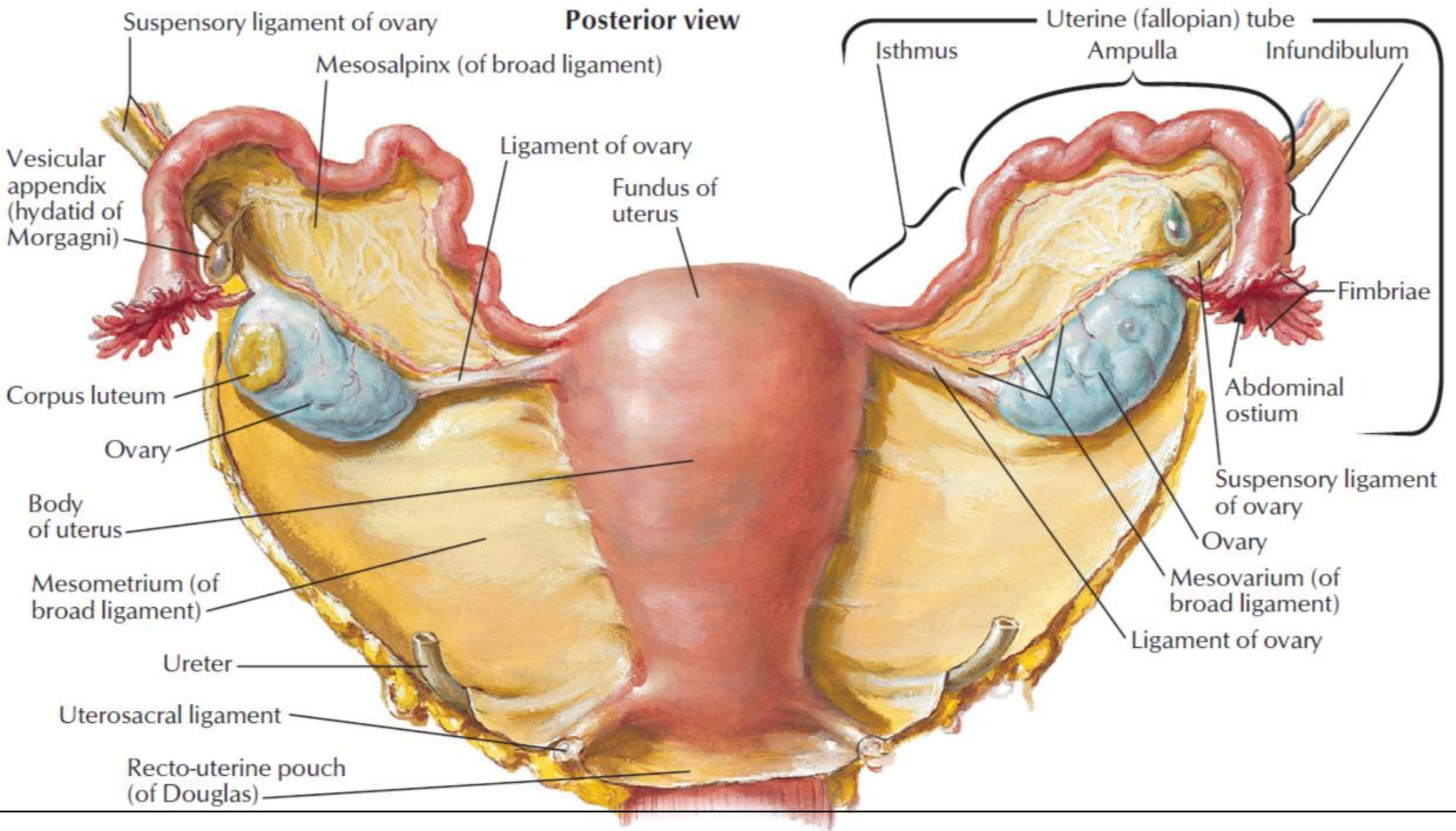
-The peritoneal and ligamentous supports of the ovary consist of the infundibulopelvic and ovarian ligaments and the mesovarium.

Infundibulopelvic (suspensory) ligament

-The suspensory or infundibulopelvic ligament of the ovary is a peritoneal fold attached to the upper part of the lateral surface of the ovary,which contain the ovarian vessels and nerves.

-On the right side, the infundibulopelvic ligament is attached to a fold of peritoneum that is posterior and inferior to the caecum and appendix.

-On the left side, the peritoneal attachment is higher than on the right, and is lateral to the junction of the descending and sigmoid colons. As it joins the peritoneum covering psoas major, the suspensory ligament of the ovary passes superiorly over the external iliac vessels, genitofemoral nerve and ureter.



Ovarian ligament (ligament of the ovary)

-The ovarian ligament (ligament of the ovary) attaches the uterine (inferomedial) extremity of the ovary to the lateral angle of the uterus, posteroinferior to the uterine tube.

-It lies in the posterior leaf of the broad ligament and contains some smooth muscle cells.

-It is continuous with the medial border of the round ligament of uterus.

-Both ligaments are remnants of the gubernaculum.

Mesovarium

-The mesovarium is a short peritoneal fold that attaches the ovary to the back of the broad ligament. It carries blood vessels and nerves to the ovarian hilum.

-The uterine tube arches over the ovary and ascends in relation to its mesovarian border, then curves over its tubal end and passes down on its posterior, free, border and medial surface.

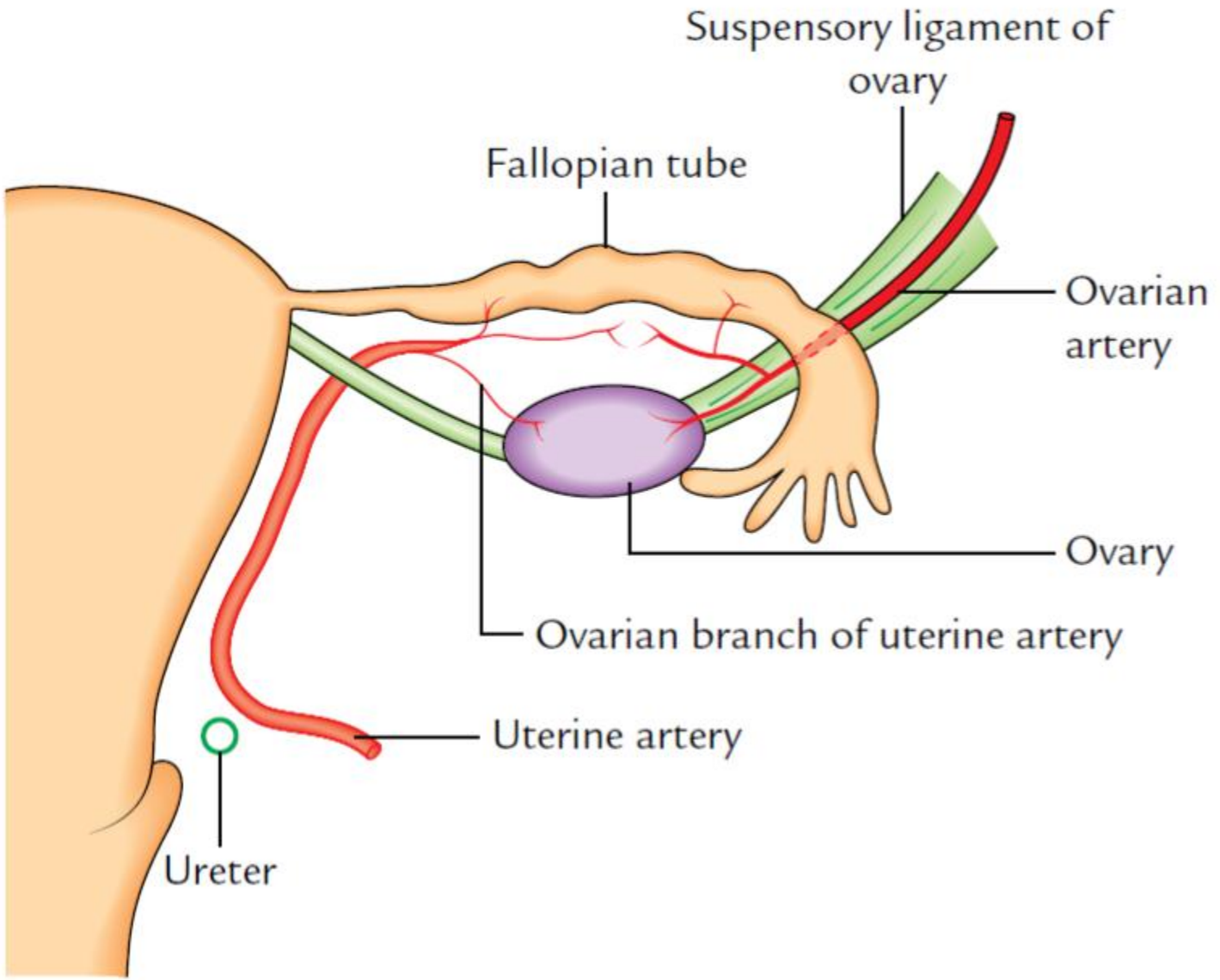
Vascular supply and lymphatic drainage

Arteries

-The ovarian arteries are branches of the abdominal aorta and originate below the renal arteries.

-Each descends behind the peritoneum and, at the brim of the pelvis, crosses the external iliac artery and vein to enter the true pelvic cavity.

-Here, the artery turns medially in the ovarian suspensory ligament and splits into a branch to the mesovarium that supplies the ovary, and a branch that continues into the uterine broad ligament, below the uterine tube, and supplies the tube.



Veins

-The ovarian veins emerge from the ovary as a plexus (pampiniform plexus) in the mesovarium and suspensory ligament .

- Two veins emerge from the plexus and ascend with the ovarian artery; they usually merge into a single vessel before entering either the inferior vena cava on the right side, or the renal vein on the left side.

Lymphatic drainage

-The main lymphatic drainage of the ovaries is along vessels that follow the ovarian veins to para-aortic nodes situated near the origin of the renal arteries.

-Drainage may also occur via pelvic nodes into lower para-aortic nodes and, rarely, may follow the round ligament to the inguinal nodes.

Innervation

-The ovarian innervation is derived from autonomic plexuses.

-The upper part of the ovarian plexus is formed from branches of the renal and aortic plexuses, and the lower part is reinforced from the superior and inferior hypogastric plexuses.

-These plexuses consist of postganglionic sympathetic fibres, preganglionic parasympathetic fibres from the sacral outflow, and visceral afferent fibres.

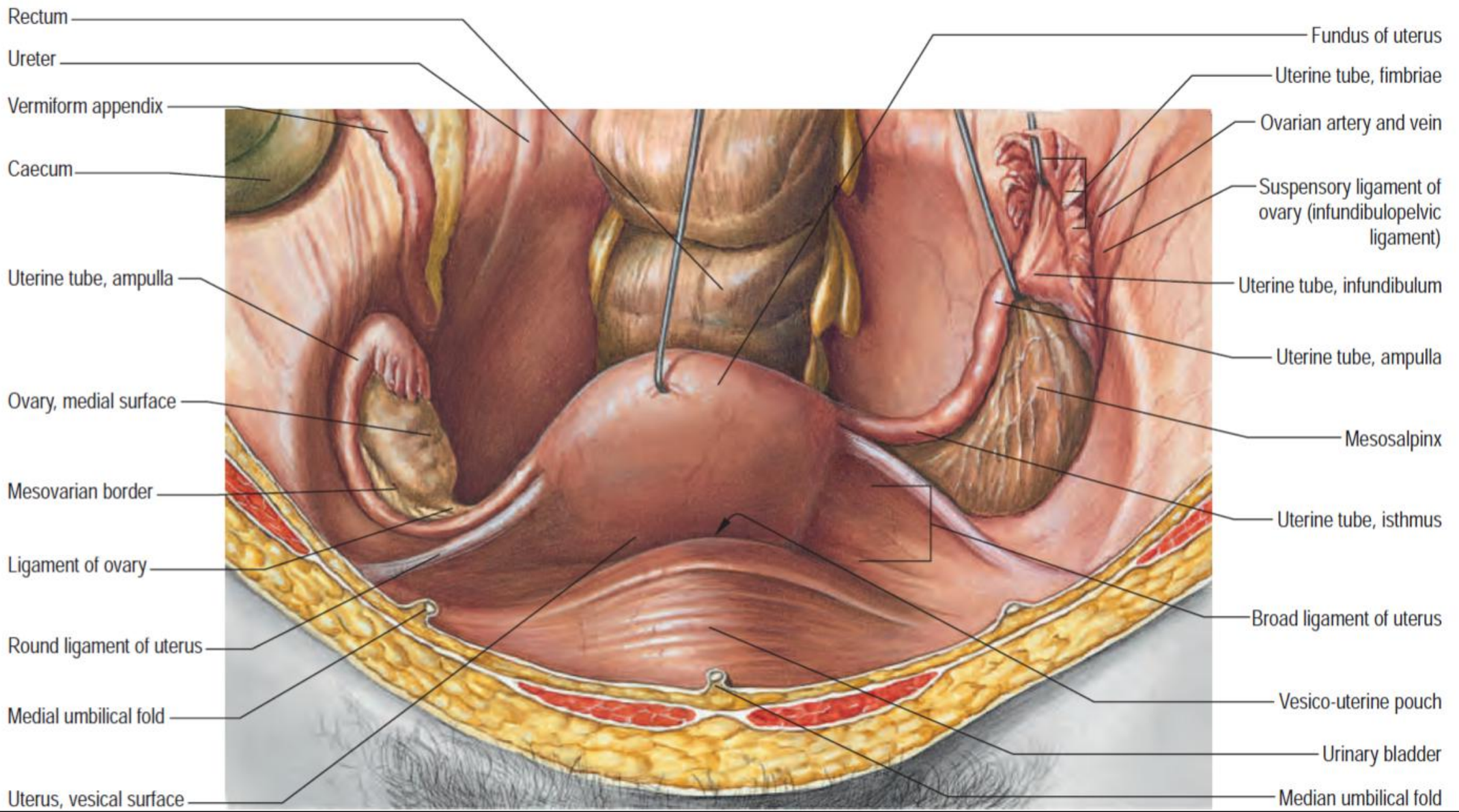
-The efferent preganglionic sympathetic fibres are derived from the tenth and eleventh thoracic spinal segments.

UTERINE(FALLOPIAN) TUBES

-The uterine tubes are a pair of ducts which transmits ova from the ovaries to the uterine cavity.

-The uterine tubes are attached to the upper part of the body of the uterus, and their ostia open into the uterine cavity.

-It is about 10 cm long and lies in the upper free margin of the broad ligament of the uterus.



External features

-It has two ends and four parts.

ENDS

1)Medial end

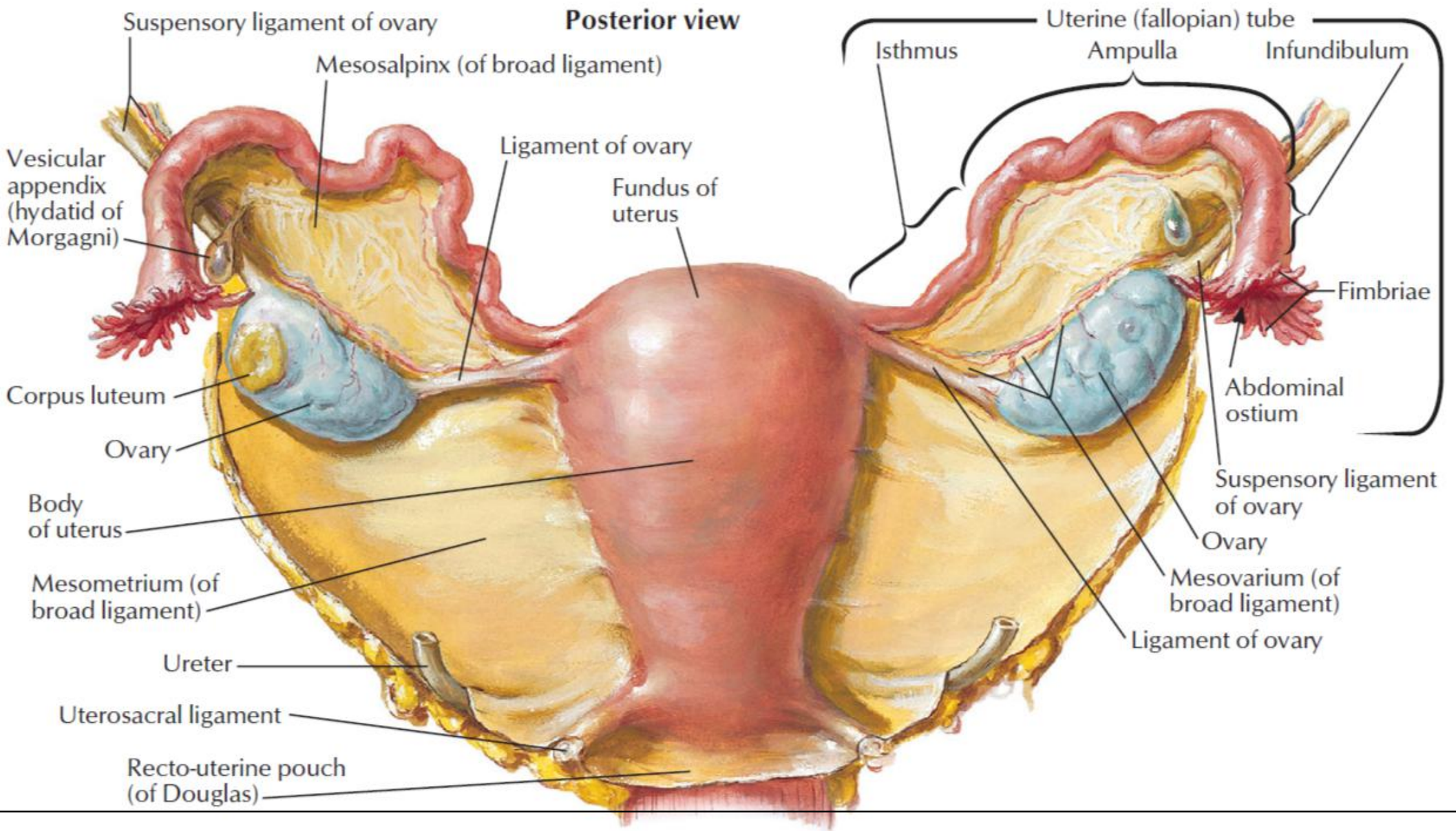
-The medial opening of the tube (the uterine os) is located at the superior angle(lateral angle) of the uterine cavity.

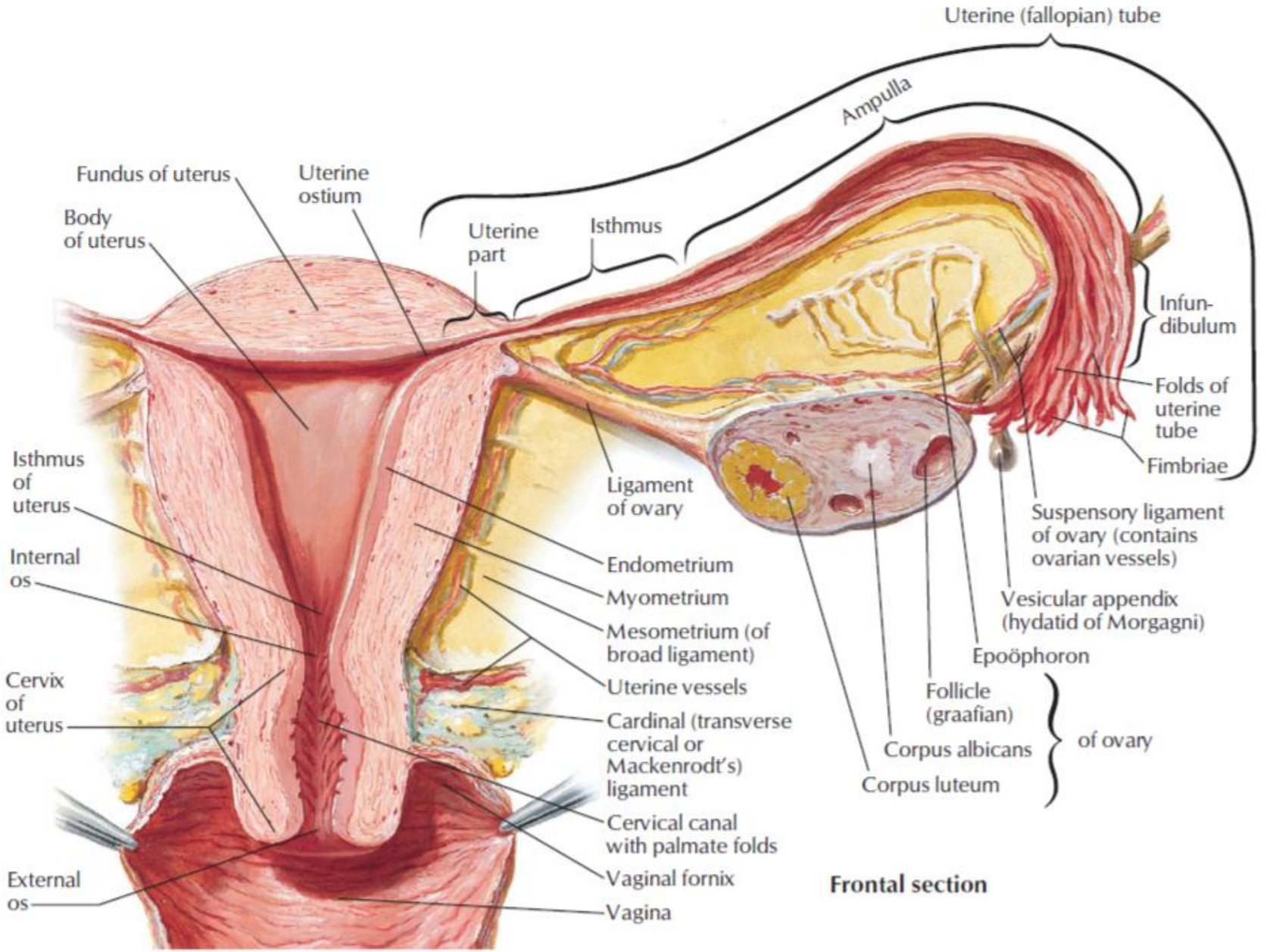
-The uterine opening is 1mm in diameter.

2)Lateral end

-It communicates with the peritoneal cavity close to the ovary by piercing the posterior layer of the broad ligament.

-The abdominal ostium is 3 mm in diameter and its margin possesses irregular small fingerlike process called fimbriae,hence it is also known as fimbriated end.





PARTS

-The tube passes laterally and superiorly, and consists of four main parts(from medial to lateral): intramural, isthmus, ampulla and fimbria(infundibulum).

1)Intramural(interstitial) part

-The intramural part is 0.7 mm wide and 1 cm long, and lies within the wall of the uterus(myometrium).

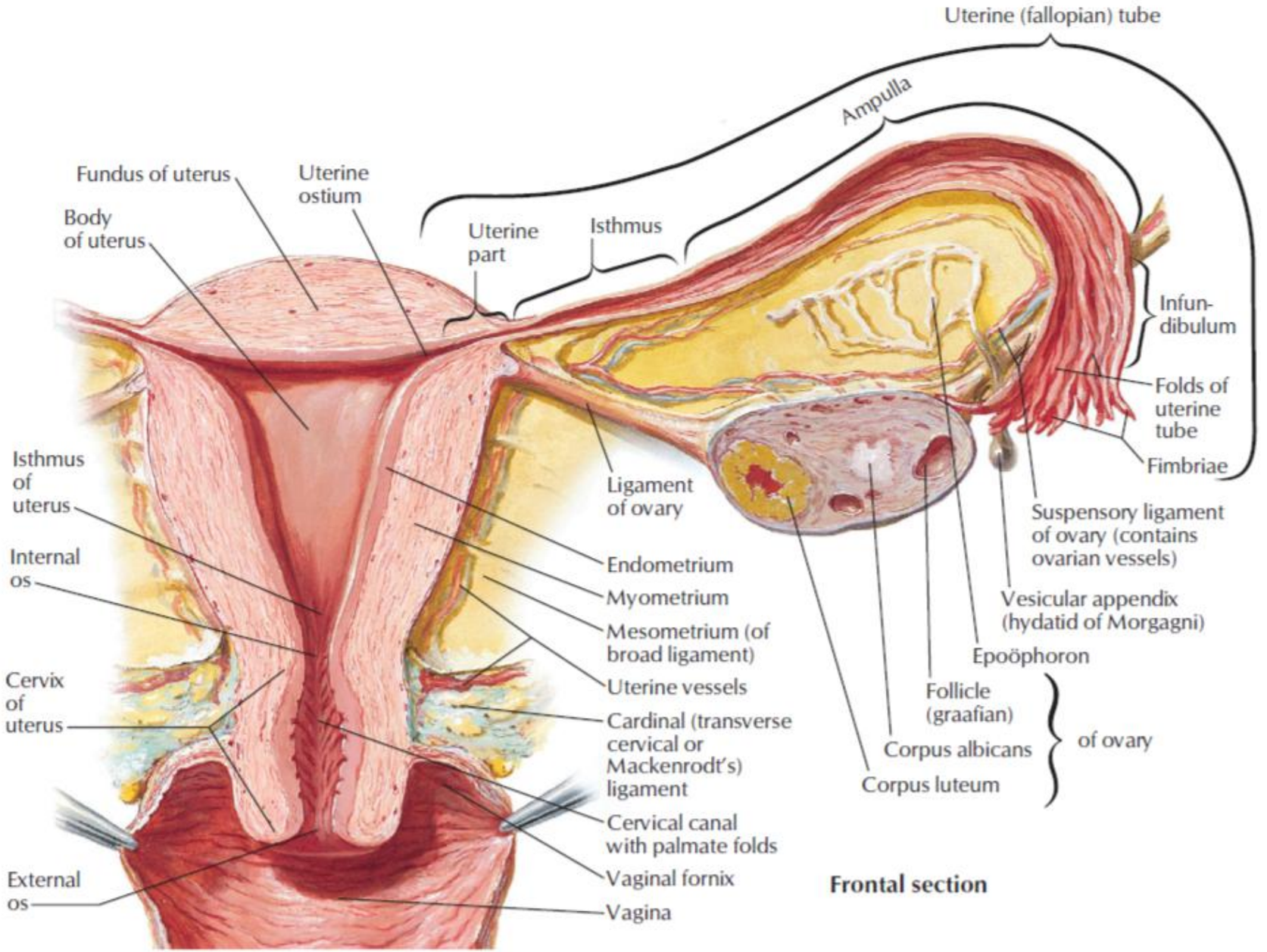
2)Isthmus

-The intramural part is continuous laterally with the isthmus, which is 1–5 mm wide and 3 cm long; it is rounded, muscular and firm.

3)Ampulla

-The isthmus is continuous laterally with the ampulla, the widest portion of the tube with a maximum luminal diameter of 1 cm.

-The ampulla is 5 cm long and has a thin wall and a tortuously folded luminal surface. Typically, fertilization takes place in its lumen.



4)Infundibulum(fimbria)

-The ampulla opens into the trumpet-shaped infundibulum at the abdominal os.

-Fimbriae, numerous mucosal finger-like folds 1 mm wide, are attached to the ends of the infundibulum and extend from its inner circumference beyond the muscular wall of the tube.

-One of these, the ovarian fimbria, is longer and more deeply grooved than the others, and is typically applied to the tubal pole of the ovary.

-At the time of ovulation, the fimbriae swell and extend as a result of engorgement of the vessels in the lamina propria, which aids capture of the released oocyte.

-All fimbriae are covered, like the mucosal lining throughout the tube, by a ciliated epithelium whose cilia beat towards the ampulla.

Vascular supply and lymphatic drainage

Arteries

-The blood supply to the uterine tubes is derived from ovarian and uterine arteries.

-The lateral third of the tube is supplied by the ovarian artery, which continues in the mesosalpinx to anastomose with branches from the uterine artery.

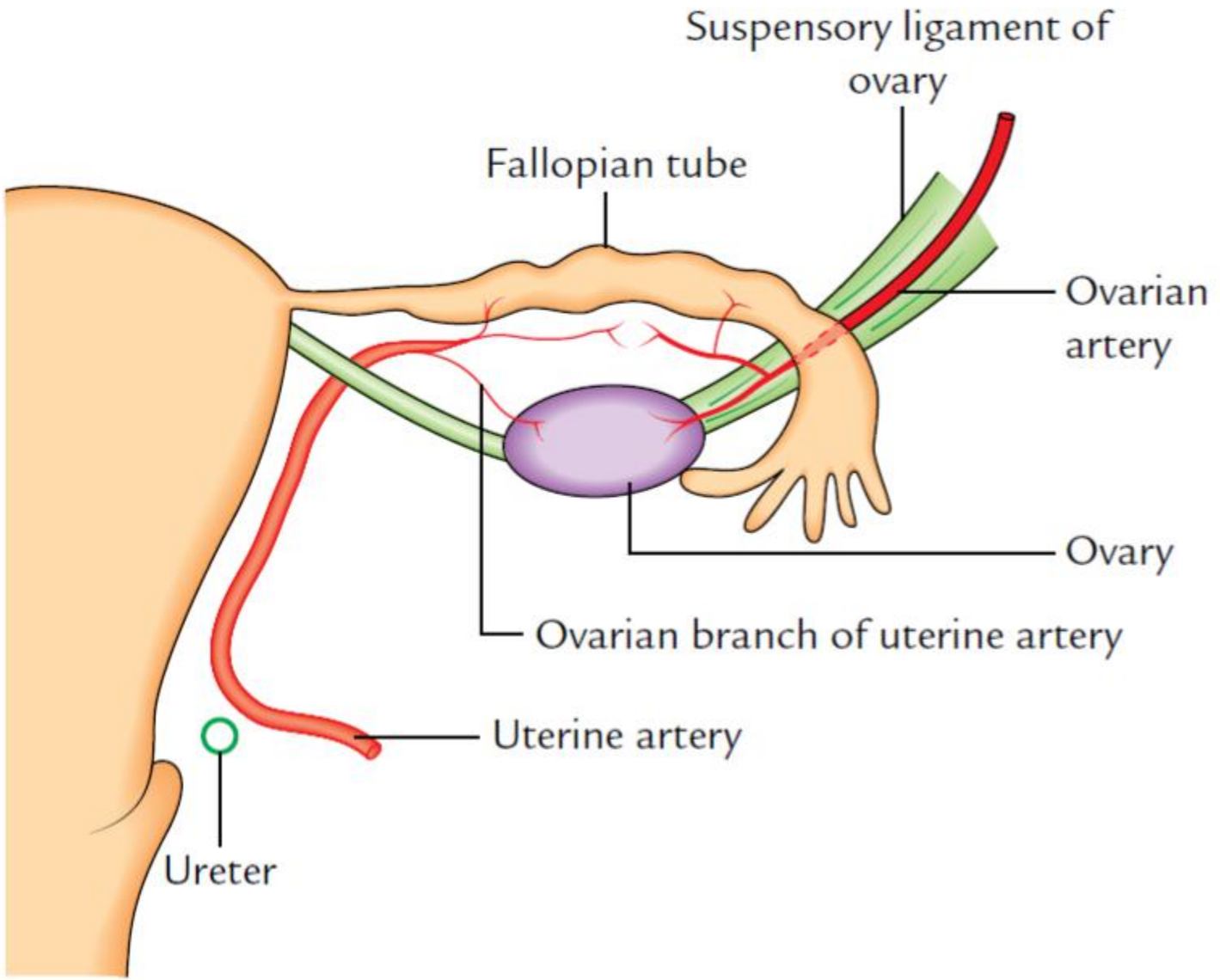
-The medial two-thirds of the tube are supplied by the uterine artery

Veins

-Venous drainage is similar to the arterial supply.

-The venous drainage of the lateral one-third of the uterine tube is via the pampiniform plexus to the ovarian veins, which open into the inferior vena cava on the right side and the renal vein on the left side.

-The medial two-thirds of the tube drain via the uterine plexus to the internal iliac vein.



Lymphatic drainage

-Lymph drainage is via ovarian vessels to the para-aortic nodes and uterine vessels to the internal iliac chain.

- It is possible for lymph to reach the inguinal nodes via the round ligament

Innervation

-The uterine tube is innervated by autonomic fibres that are distributed mainly with the ovarian and uterine arteries. Most of the tube has a dual sympathetic and parasympathetic supply.

-Preganglionic parasympathetic fibres are derived from the vagus for the lateral half of the tube, and pelvic splanchnic nerves for the medial half.

-Preganglionic sympathetic supply is derived from neurons in the intermediolateral column of the tenth thoracic to the second lumbar spinal segments.

-Postganglionic sympathetic fibres are most likely derived from the superior hypogastric plexus, via the superior hypogastric and hypogastric nerves .

UTERUS

-The uterus is a thick-walled, muscular organ situated in the pelvis between the urinary bladder and the rectum.

-It lies posterior to the bladder and uterovesical space, and anterior to the rectum and recto-uterine pouch; it is mobile, which means that its position varies with distension of the bladder and rectum.

-Superiorly,on each side,it communicates with the uterine tube and inferiorly with the vagina.

Shape and size

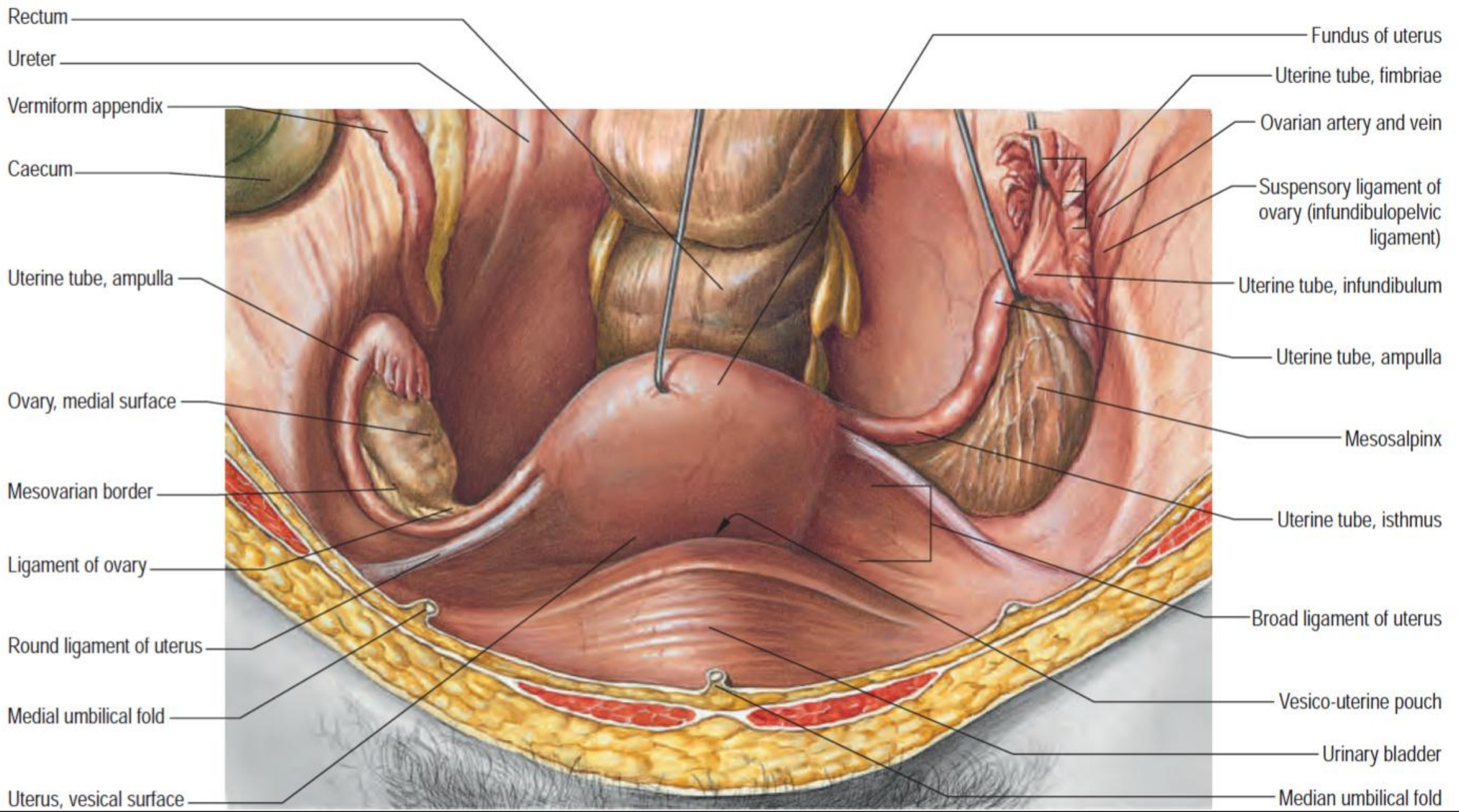
-It is pear shaped,being flattened anteroposteriorly

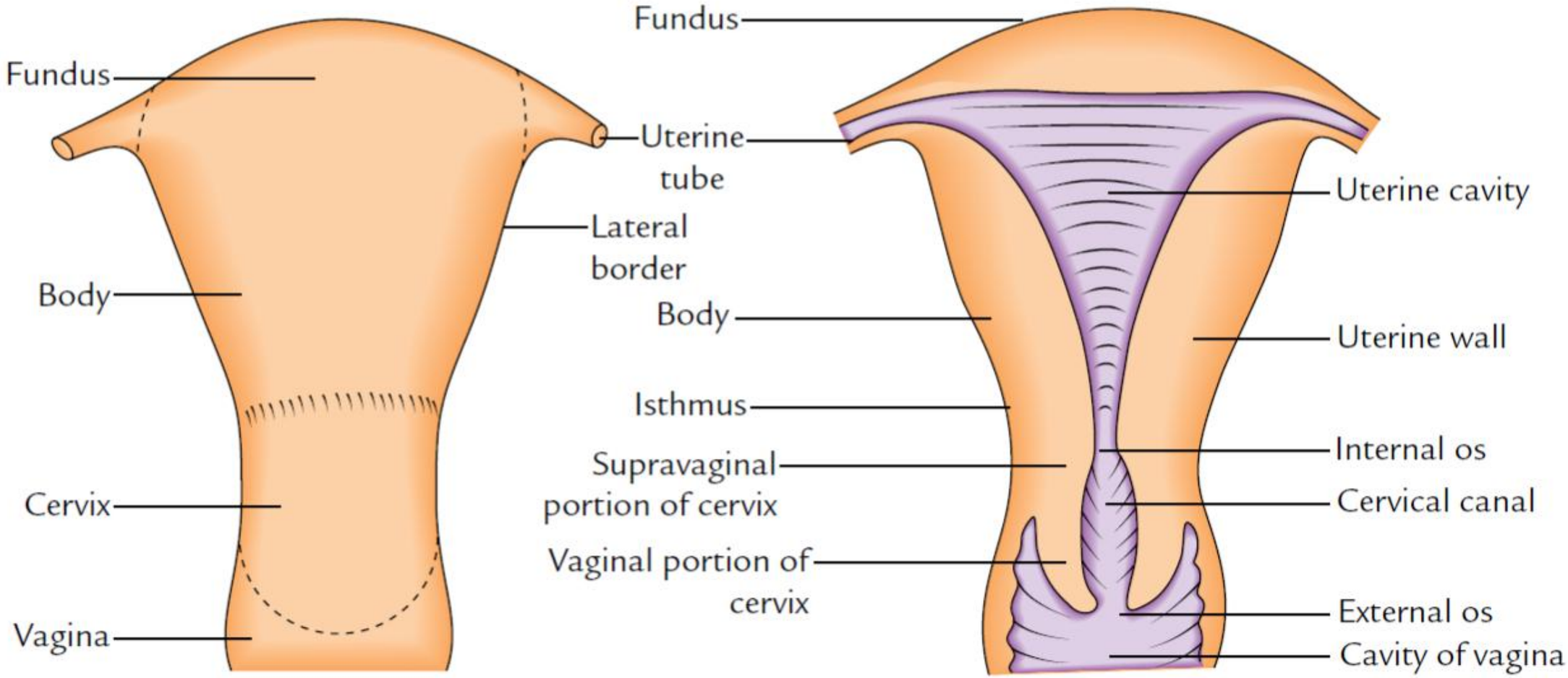
Length-3 inches

Breadth(at fundus)-2 inches

Thickness-1 inch

Weight-30-40 g





Parts of uterus

-The uterus is divided structurally and functionally into two main regions: the muscular body of the uterus (corpus uteri) forms the upper two-thirds, and the fibrous cervix (cervix uteri) forms the lower third.

-The junction between the body and cervix is marked by a circular constriction called isthmus.

-The uterine tubes are attached to the upper part of the body and this point of fusion between uterine tube and body is called as cornu of the uterus.

Normal position and axis of uterus

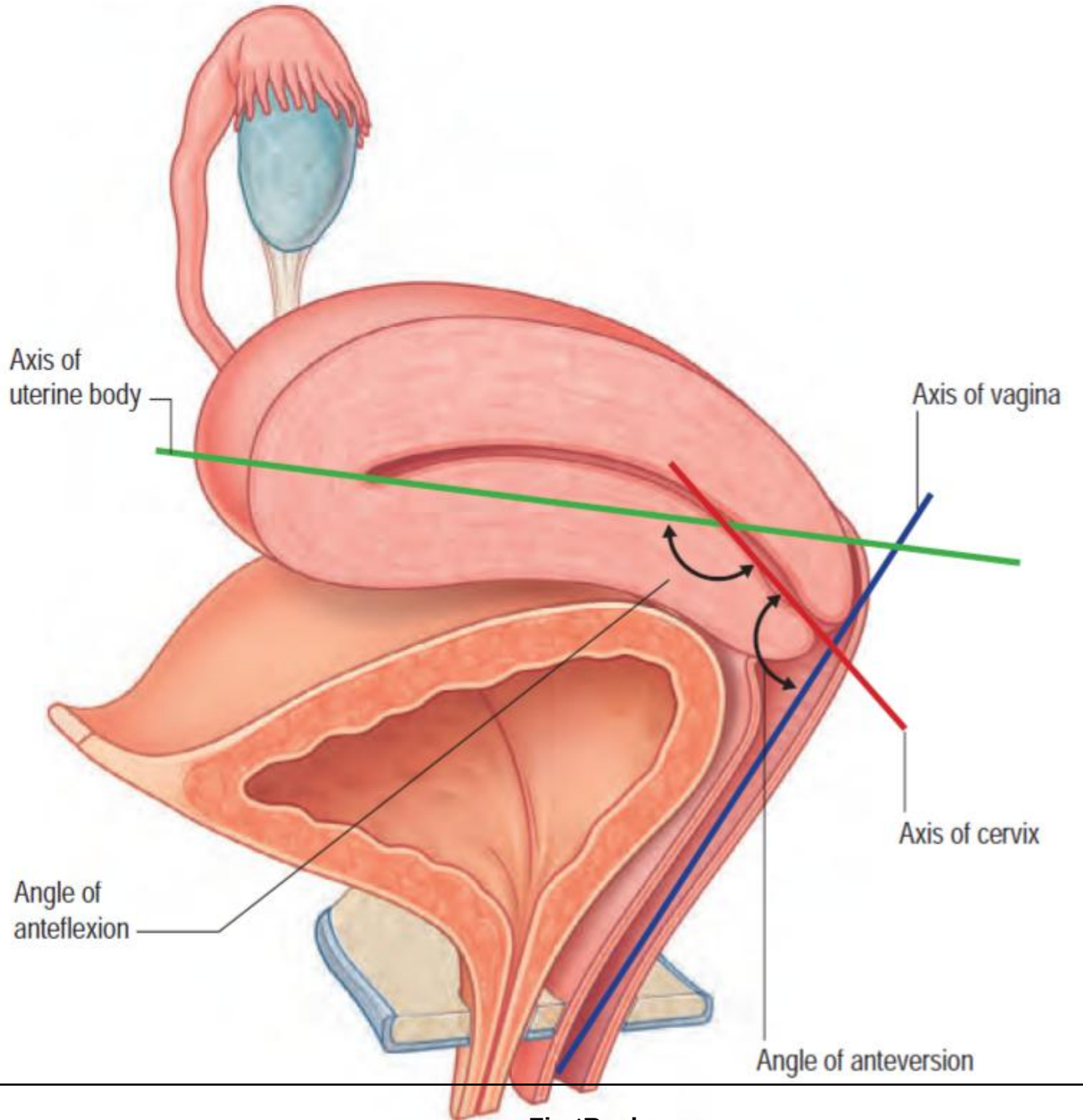
-In the adult nulliparous state, the cervix usually tilts forwards relative to the axis of the vagina (anteversion), and the body of the uterus tilts forwards relative to the cervix (anteflexion).So,normally the uterus lies in position of anteversion and anteflexion.

(Anteversion: The long axis of the cervix is normally bent forward on the long axis of vagina forming an angle of about 90°. This position is called the position of anteversion.

Anteflexion: The long axis of the body of uterus is bent forward at the level of isthmus (internal os) on the long axis of cervix forming an angle of 170°. This position of the uterus is known as anteflexion.)

-In 10–15% of women, the whole uterus leans backwards at an angle to the vagina and is said to be retroverted.

-A uterus that angles backwards on the cervix is described as retroflexed.



Body of uterus

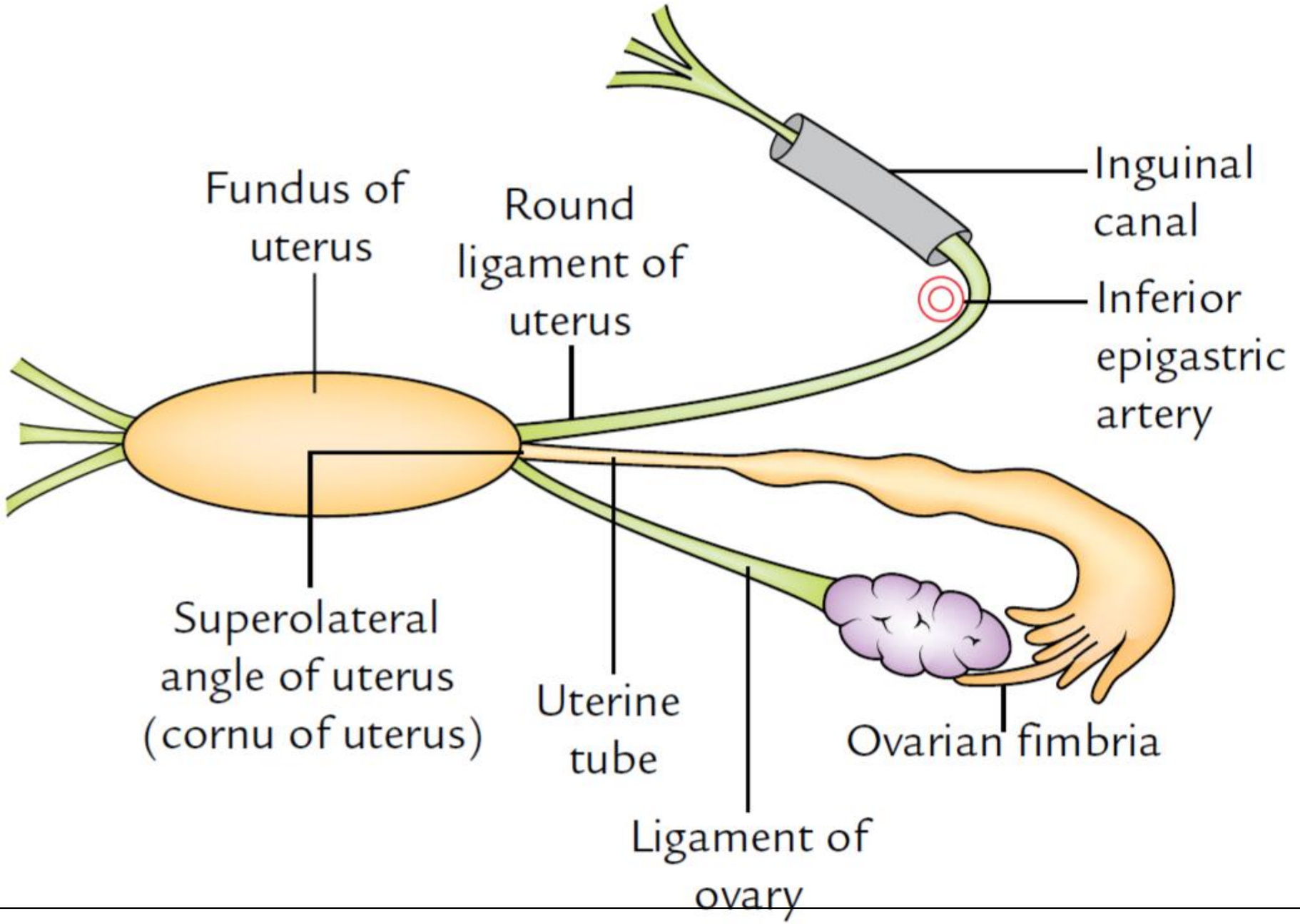
-The body of the uterus is pear-shaped and extends from the fundus superiorly to the cervix inferiorly.

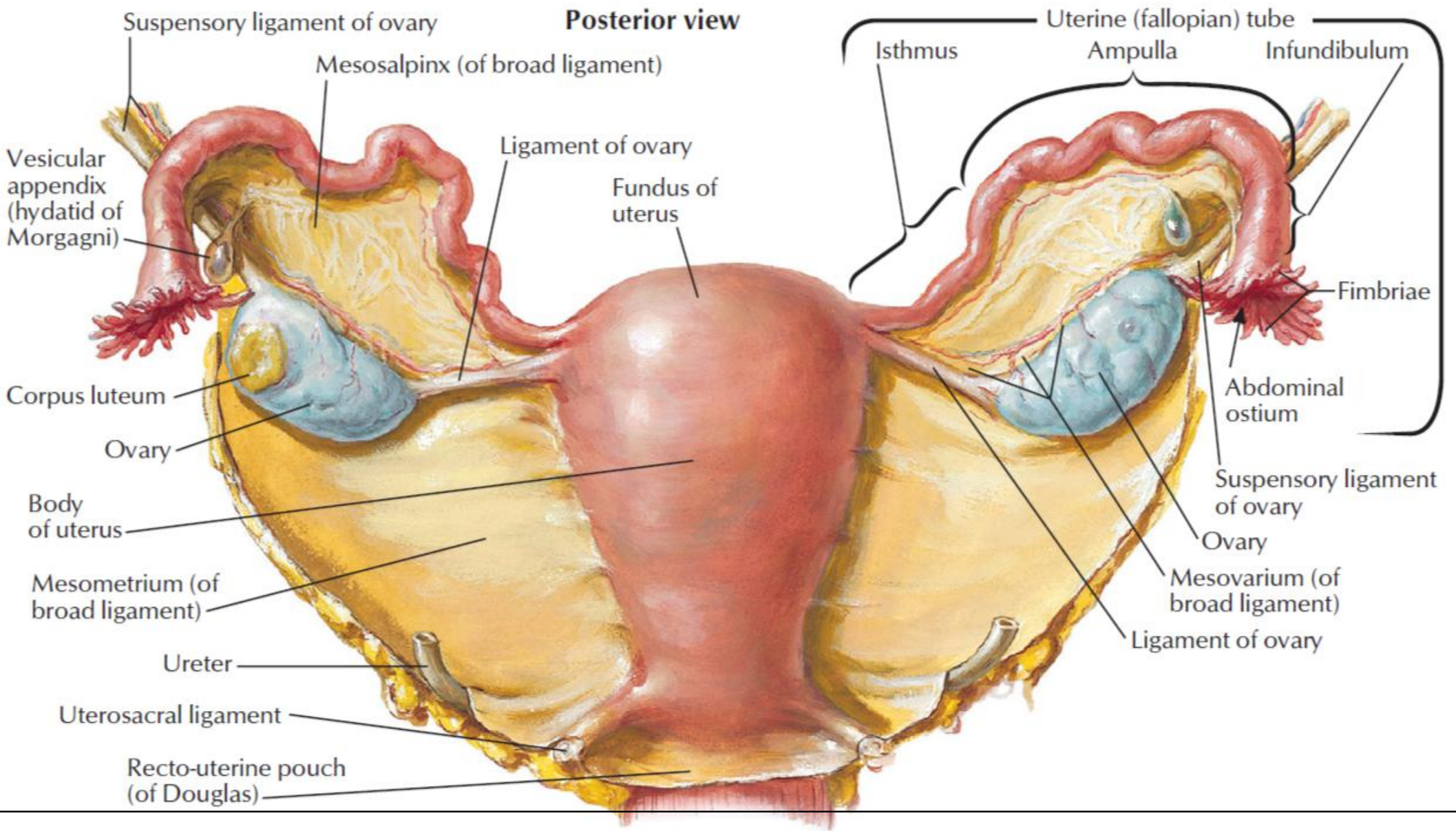
-The uterine tubes enter the uterus on both sides at the uterine cornua.

-The round and ovarian ligaments are inferoanterior and inferoposterior, respectively, to each cornu

-The dome-like fundus is superior to the entry points of the uterine tubes and covered by peritoneum that is continuous with that of neighbouring surfaces.

-The fundus is in contact with coils of small intestine and, occasionally, by distended sigmoid colon.



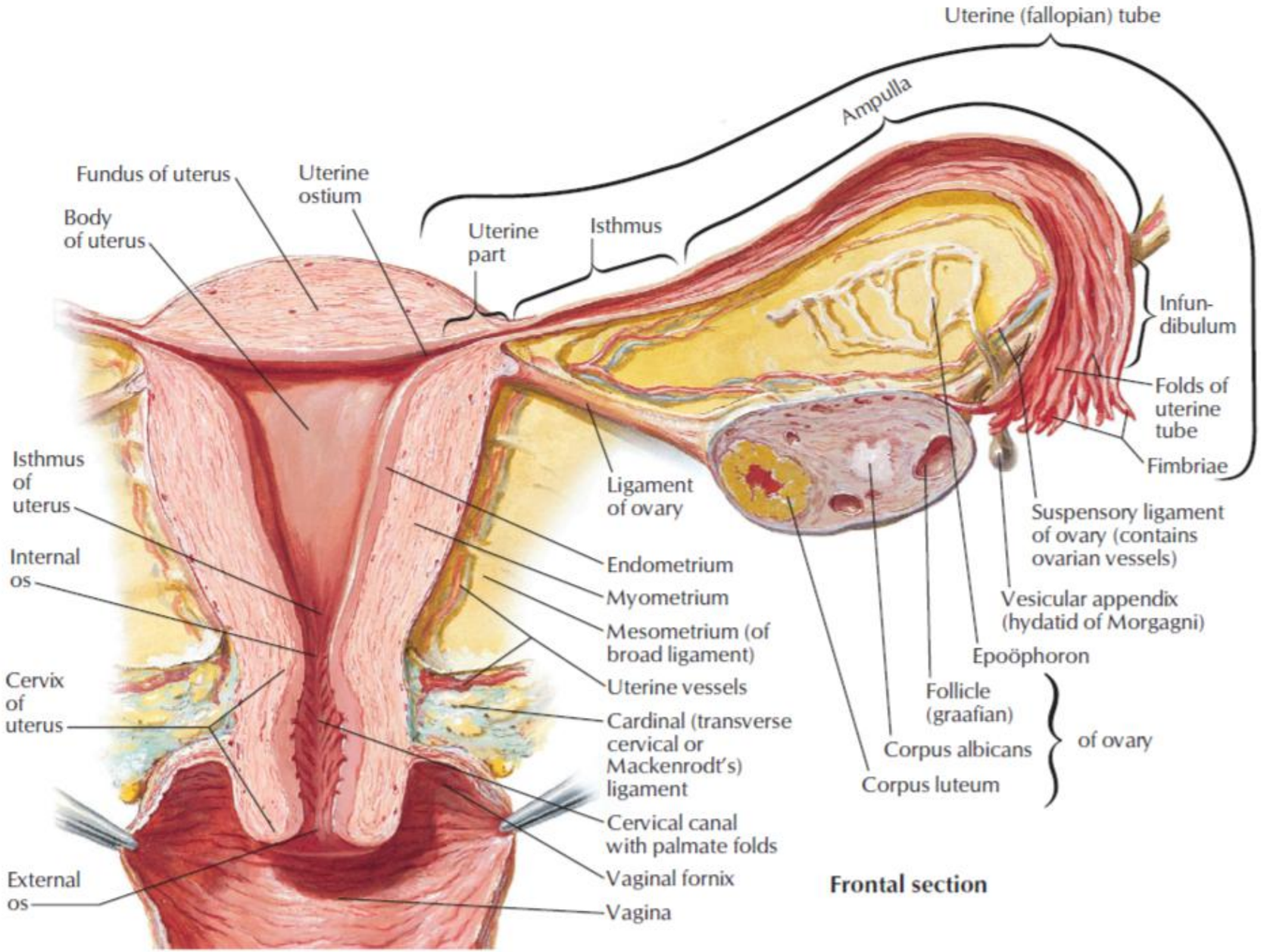


-The body extends from the fundus to the isthmus and contains the uterine cavity. It is flattened anteroposteriorly and presents anterior and posterior surfaces, and right and left lateral borders.

-The lateral margins of the body are convex; on each side, their peritoneum is reflected laterally to form the broad ligament, which extends as a flat sheet to the pelvic wall.

-It is related to the uterine artery.

-The uterine tube enters the uterus at the upper end of this border. Here the round ligament of the uterus is attached anteroinferior to the tube and the ligament of the ovary is attached posteroinferior to the tube.



Anterior surface

The anterior surface of the uterine body is covered by peritoneum reflected on to the bladder at the uterovesical fold .

-This normally occurs at the level of the internal os, the most inferior margin of the body of the uterus.

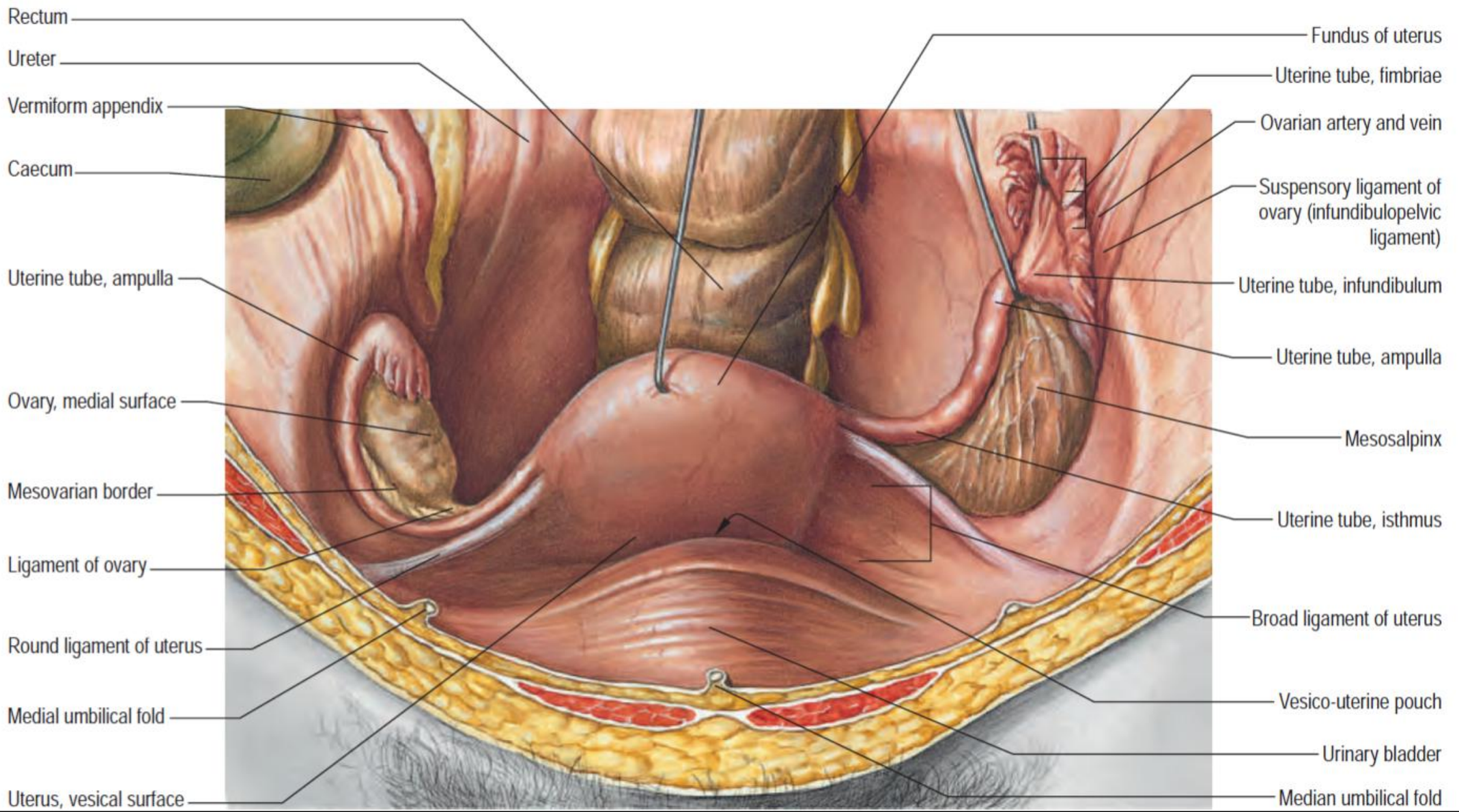
-The vesicouterine pouch, between the bladder and uterus, is obliterated when the bladder is distended, but may be occupied by small intestine when the bladder is empty.

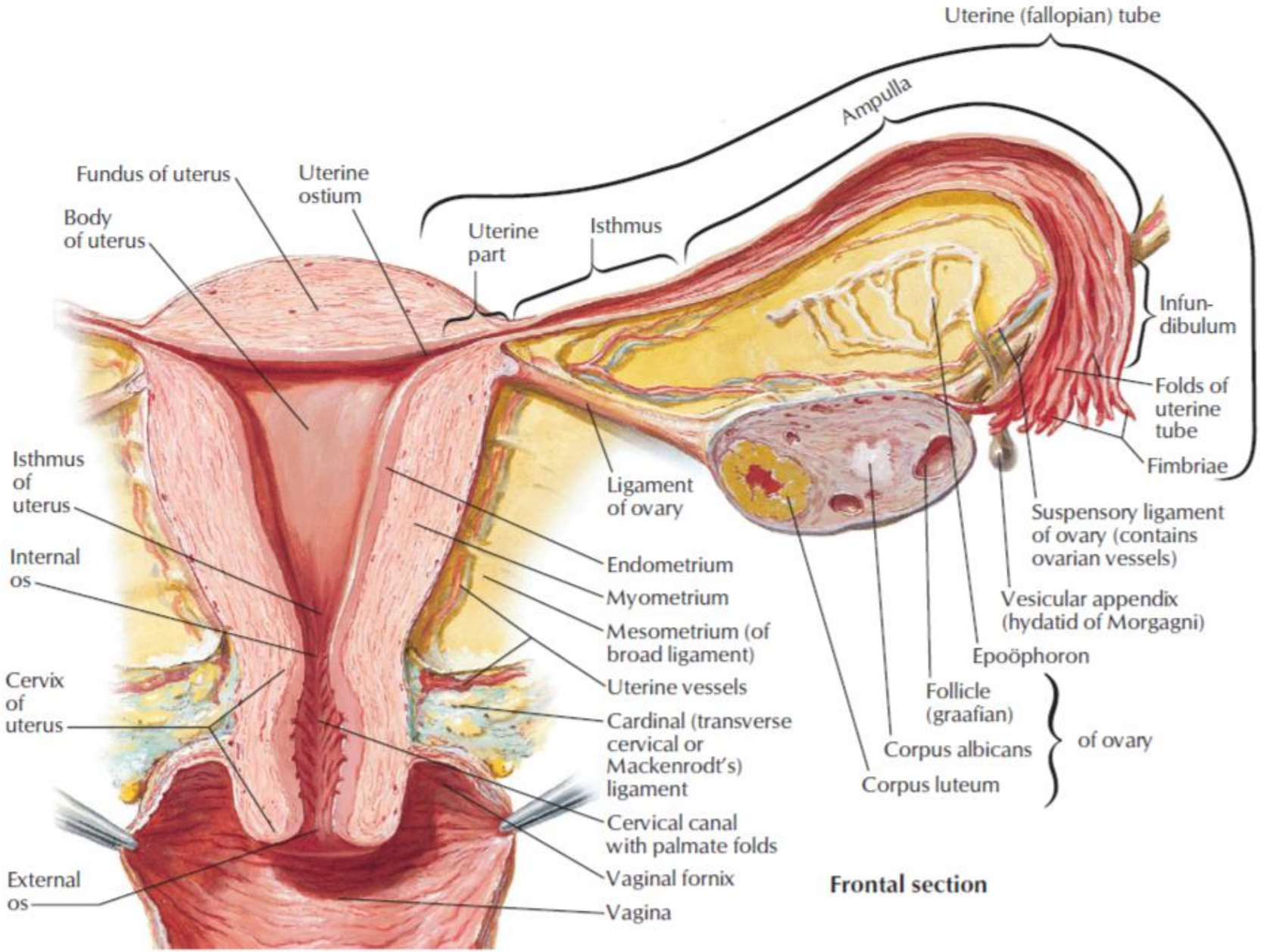
Posterior surface

-The posterior surface of the uterus is convex transversely.

-Its peritoneal covering continues down to the cervix and upper vagina, and is then reflected back to the rectum along the surface of the recto-uterine pouch, which lies posterior to the uterus.

-The sigmoid colon, and occasionally the terminal ileum, lie posterior to the uterus.





- The cavity of the uterine body usually measures 6 cm from the external os of the cervix to the wall of the fundus and is flat in its anteroposterior plane.

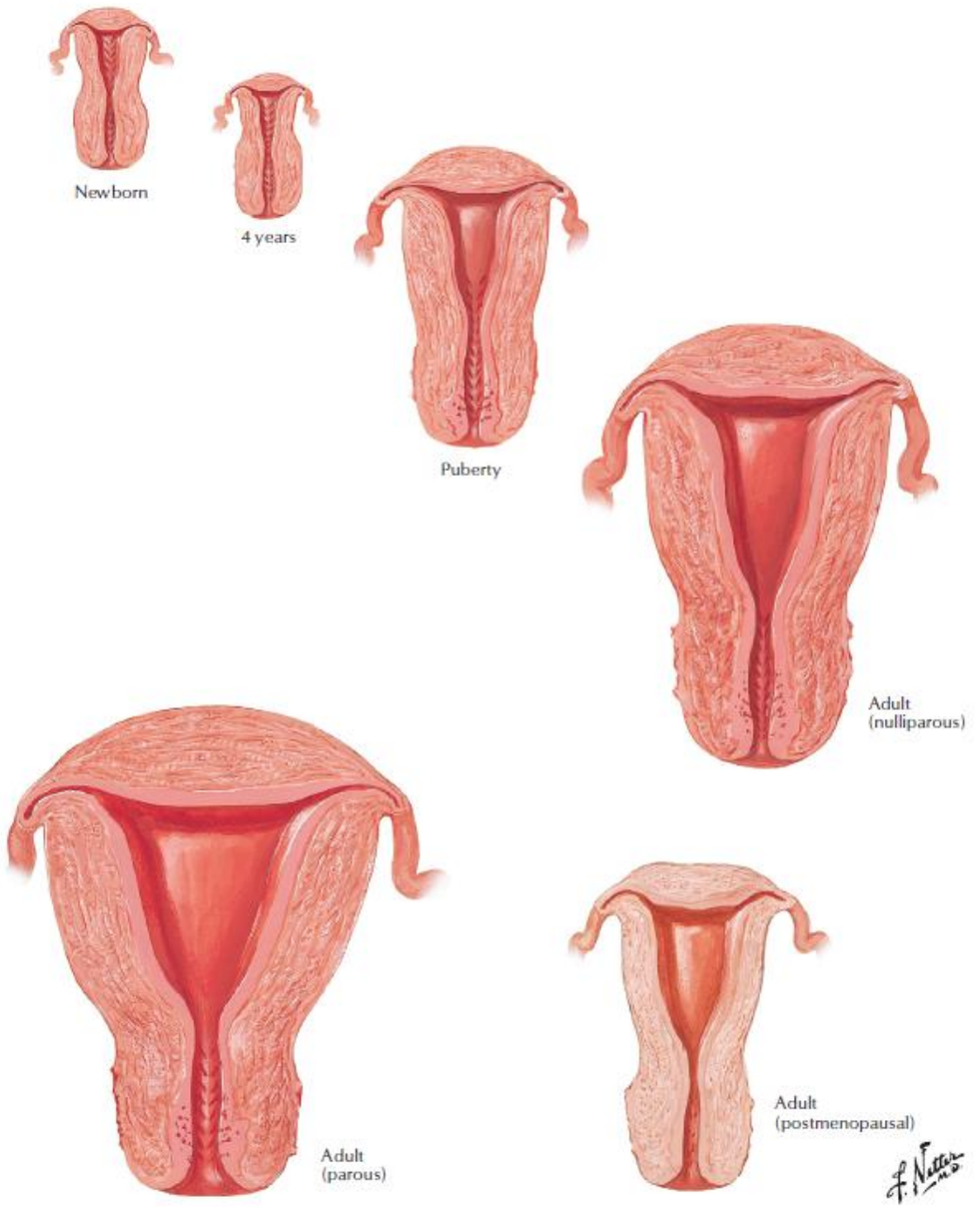
-In coronal section, uterus is triangular,broad above where the two uterine tubes join the uterus, and narrow below at the internal os of the cervix.

-There is no change in the size of the uterus until approximately 7 years of age, when there is greater enlargement of the body of the uterus than the cervix.

Developmental anomalies of the uterus

-There may be failure in fusion of the paramesonephric (Müllerian) ducts, which results in a uterus that is not pear-shaped.

-There may only be a septum (septate uterus) or partial clefting of the uterus (bicornuate uterus); the most extreme example is a septate vagina, two cervices and two discrete uteri,each with one uterine tube (uterus didelphys)



Cervix

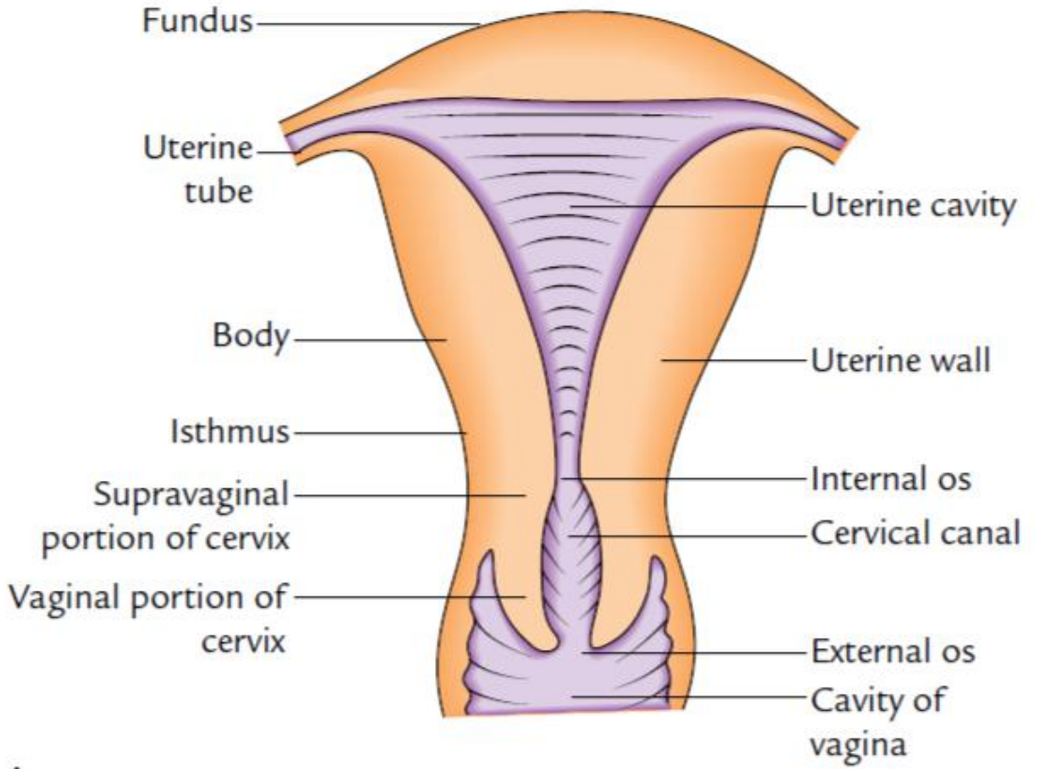
-The adult, non-pregnant cervix is narrower and more cylindrical than the body of the uterus and is typically 2.5 cm long.

-The upper end communicates with the uterine body via the internal os, and the lower end opens into the vagina at the external os .

-In nulliparous women, the external os is usually a circular aperture, whereas, after childbirth, it is a transverse slit.

-Two longitudinal ridges, one each on its anterior and posterior walls, give off small, oblique, palmate folds that ascend laterally like the branches of a tree (arbor vitae uteri); the folds on opposing walls interdigitate to close the canal.

-The narrower isthmus forms the upper third of the cervix.



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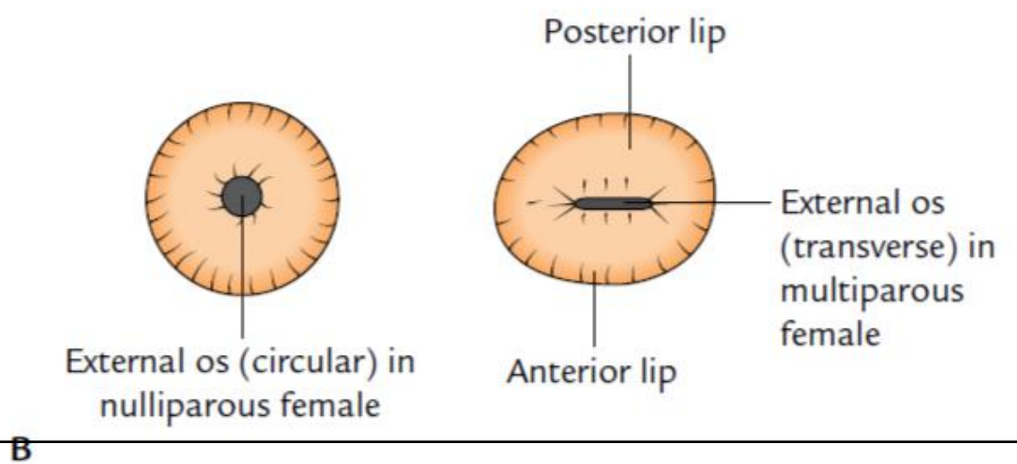

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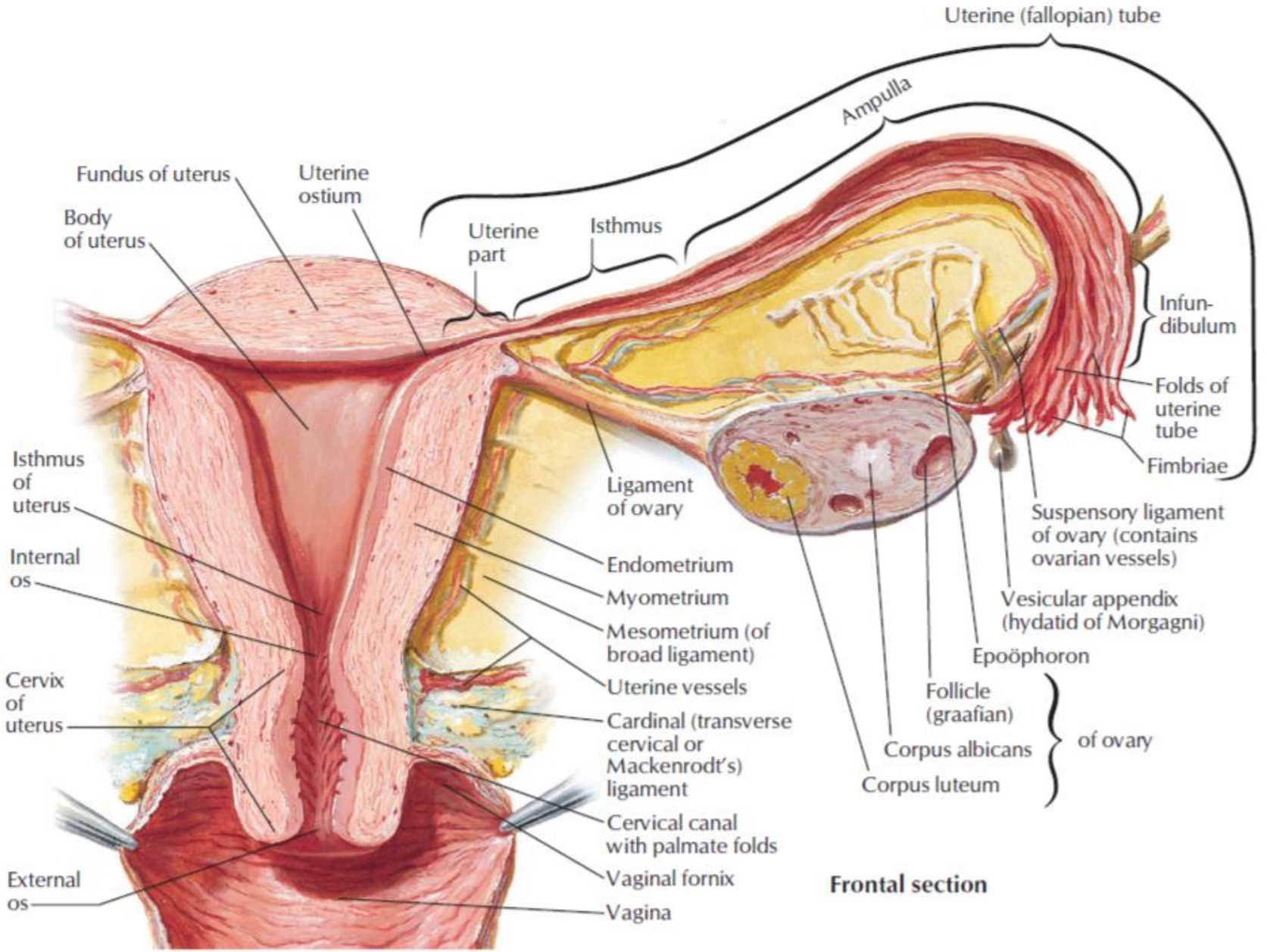


- Although unaffected in the first month of pregnancy, the isthmus is gradually taken up into the uterine body during the second month to form the ‘lower uterine segment’.

-In nonpregnant women, the isthmus undergoes menstrual changes, although these are less pronounced than those occurring in the uterine body.

-The external end of the cervix enters the upper end of the vagina, thereby dividing the cervix into supravaginal and vaginal parts.

-The supravaginal part is separated anteriorly from the bladder by cellular connective tissue:the parametrium, which also passes to the sides of the cervix and laterally between the two layers of the broad ligaments.

Relations of the uterus

Anteriorly

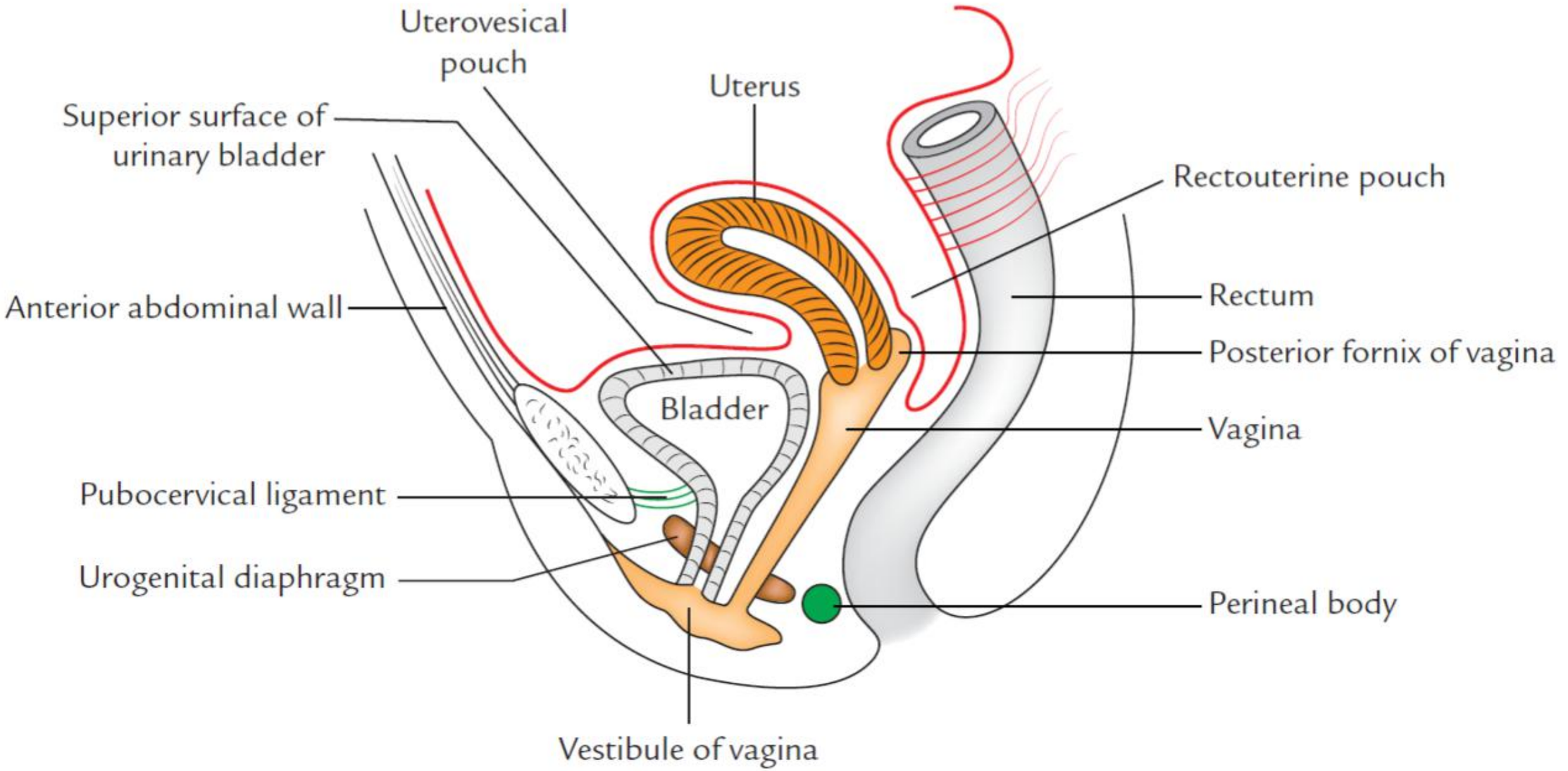
1. The body of uterus is related to the uterovesical pouch and the superior surface of urinary bladder.
2. The supravaginal portion of cervix is related to the posterior surface of urinary bladder.
3. The vaginal portion of cervix is related to the anterior fornix of the vagina.

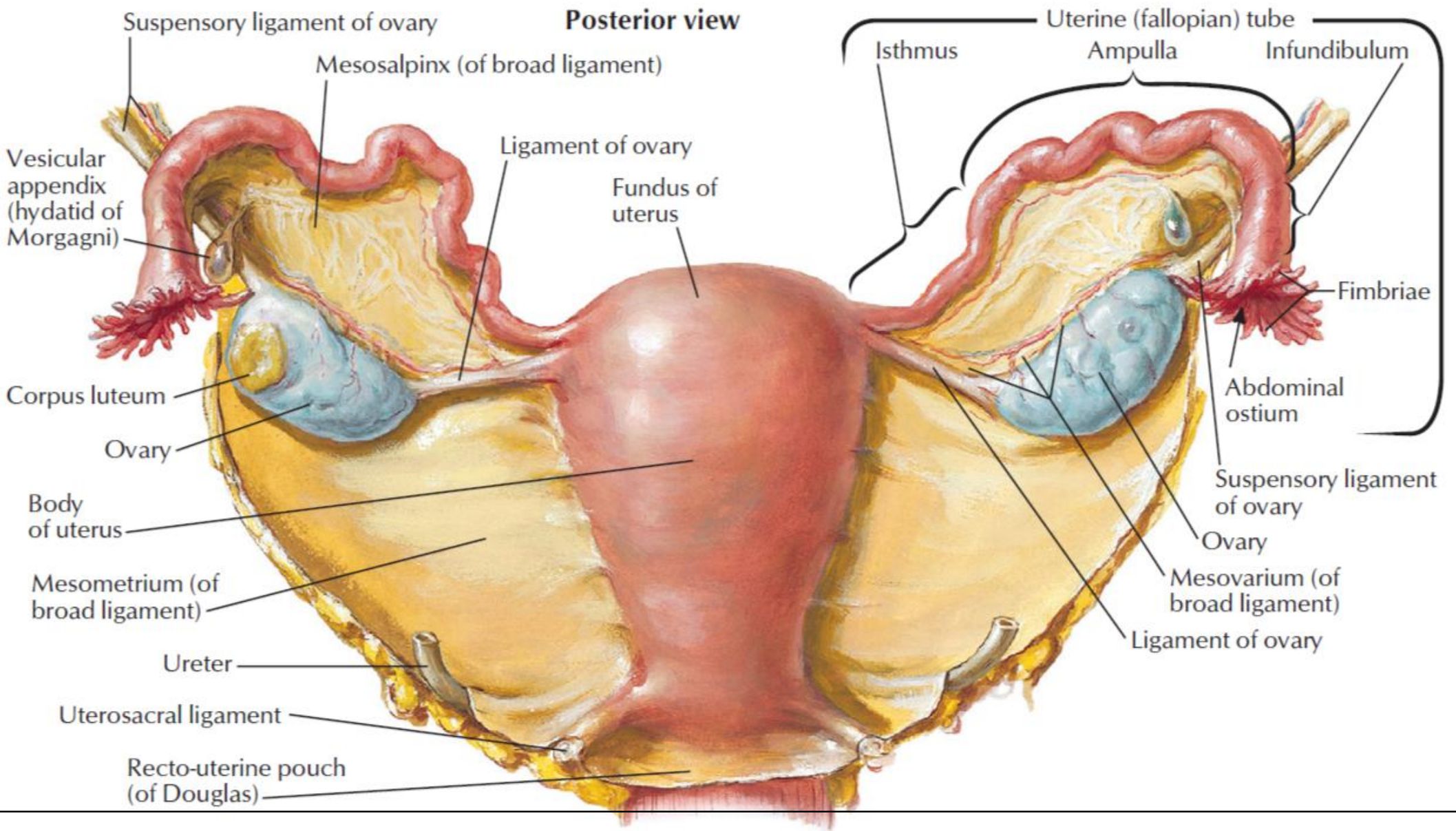
Posteriorly

1. The body of uterus is related to the rectouterine pouch with coils of ileum and sigmoid colon in it.
2. The supravaginal portion of cervix is related to the rectouterine pouch with coils of ileum and sigmoid colon in it.
3. The vaginal portion of cervix is related to posterior fornix.

Laterally

1. The body of uterus is related to the broad ligament and uterine artery and vein.
2. The supravaginal portion of cervix is related to the ureter and uterine artery.
3. The vaginal portion of cervix is related to the lateral fornices of the vagina.





Peritoneal folds and ligaments of the pelvis

-The uterus is connected to a number of ‘ligaments’.

-Some are true ligaments,in that they have a fibrous composition and provide support to the uterus; some provide no support to the uterus; and others are simply folds of peritoneum.

Peritoneal folds

-The parietal peritoneum is reflected over the upper genital tract to produce anterior (uterovesical), posterior (rectovaginal) and lateral peritoneal folds.

-The lateral folds are commonly called the broad ligaments

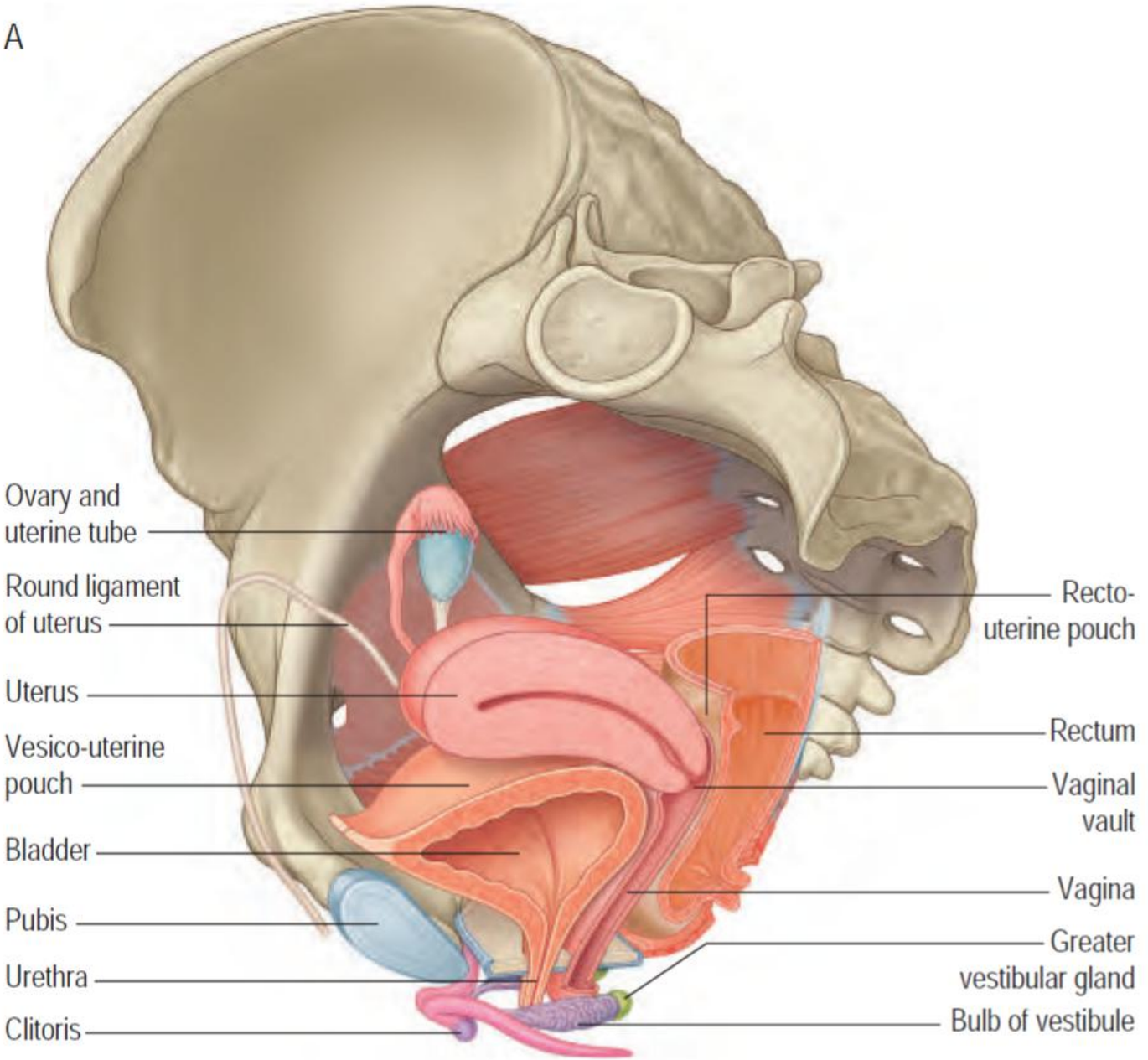
False ligaments		True ligaments
Broad ligaments	Paired	Round ligaments
Rectouterine folds	Paired	Transverse cervical ligaments
Uterovesical fold (anterior ligament)	Unpaired	Uterosacral ligaments
Rectovaginal fold (posterior ligament)	Unpaired	Pubocervical ligaments

Uterovesical and rectovaginal folds

-The anterior, or uterovesical, fold consists of peritoneum reflected on to the bladder from the uterus at the junction of its cervix and body .

-The posterior or rectovaginal fold extends lower than the anterior fold and consists of peritoneum reflected from the posterior vaginal fornix on to the front of the rectum, thereby creating the deep recto-uterine pouch (pouch of Douglas).

-The recto-uterine pouch is bounded anteriorly by the uterus, supravaginal cervix and posterior vaginal fornix; posteriorly, by the rectum; and laterally, by the uterosacral ligaments.



Broad ligament

-The lateral folds, or broad ligaments, extend on each side from the uterus to the lateral pelvic walls, where they become continuous with the peritoneum covering those walls.

-The upper border is free and the lower border is continuous with the peritoneum over the bladder, rectum and side wall of the pelvis.

-The borders are continuous with each other at the free edge via the uterine fundus, and diverge below near the superior surfaces of levatores ani.

-A uterine tube lies in the upper free border on either side.

-The broad ligament is divided into an upper mesosalpinx, a posterior mesovarium,an inferior mesometrium and infundibulopelvic ligament

Mesosalpinx

-The mesosalpinx is attached above to the uterine tube and posteroinferiorly to the mesovarium.

-Superior and laterally, it is attached to the suspensory ligament of the ovary; medially, it is attached to the ovarian ligament.

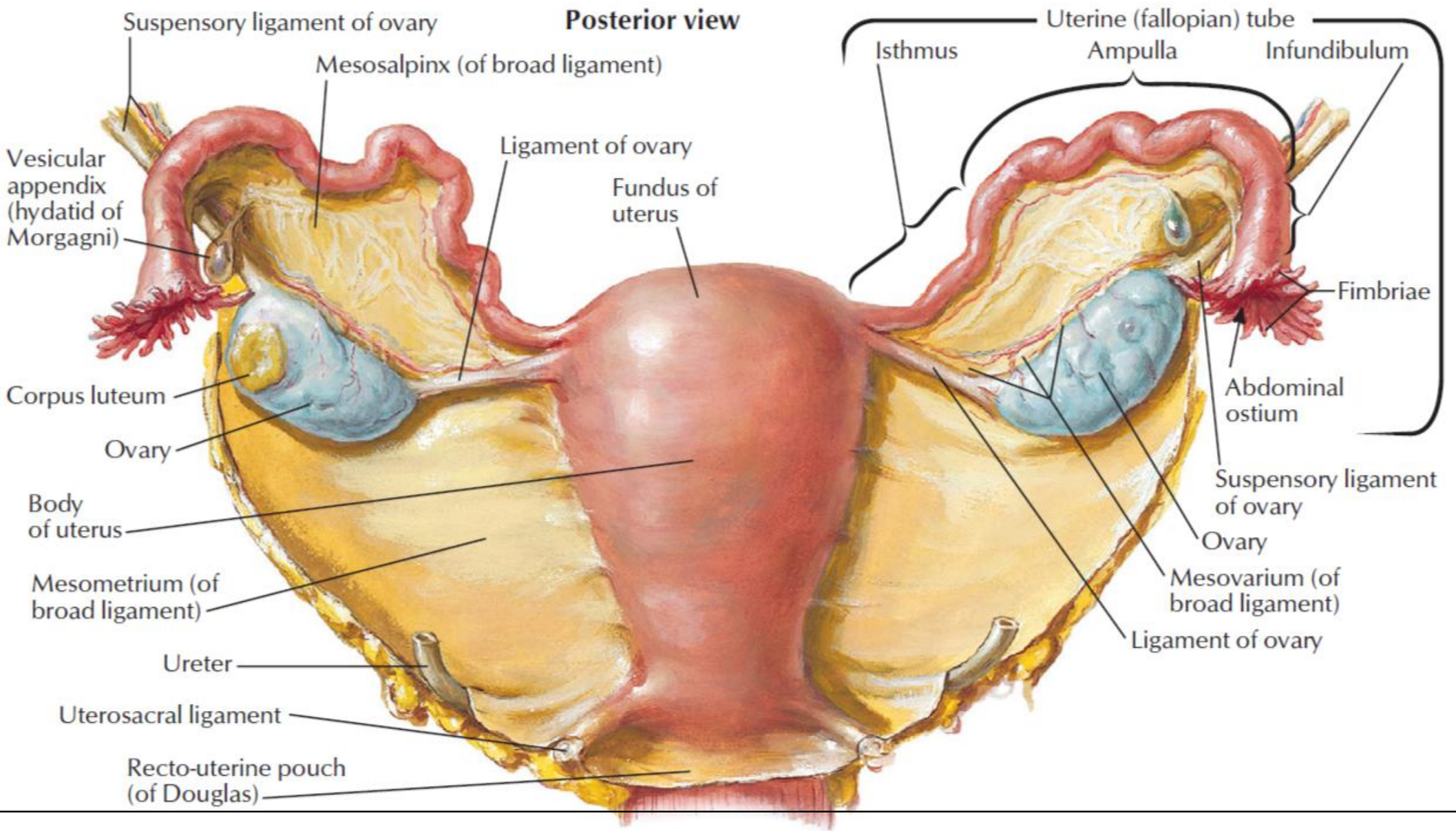
-The fimbria of the tubal infundibulum projects from its free lateral end.

-Between the ovary and uterine tube, the mesosalpinx contains vascular anastomoses between the uterine and ovarian vessels, the epoophoron and the paroophoron.

Mesovarium

-The mesovarium projects from the posterior aspect of the broad ligament, of which it is the smaller part.

-It is attached to the hilum of the ovary and carries vessels and nerves to the ovary.



Mesometrium

-The mesometrium is the largest part of the broad ligament, and extends from the pelvic floor to the ovarian ligament and uterine body.

-The uterine artery passes between its two peritoneal layers typically 1.5 cm lateral to the cervix; it crosses the ureter shortly after its origin from the internal iliac artery and gives off a branch that passes superiorly to the uterine tube, where it anastomoses with the ovarian artery .

-Between the pyramid formed by the infundibulum of the tube, the upper pole of the ovary, and the lateral pelvic wall, the mesometrium contains the ovarian vessels and nerves lying within the fibrous suspensory ligament of the ovary (infundibulopelvic ligament).

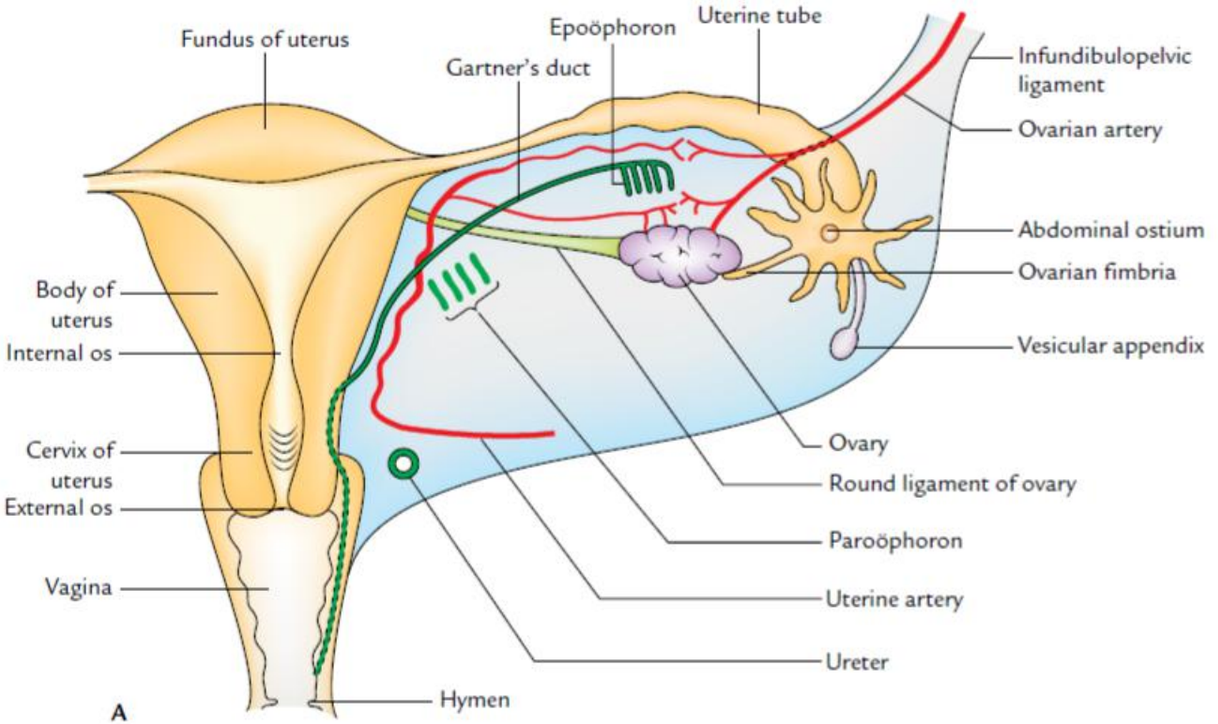
-This ligament continues laterally over the external iliac vessels as a distinct fold.

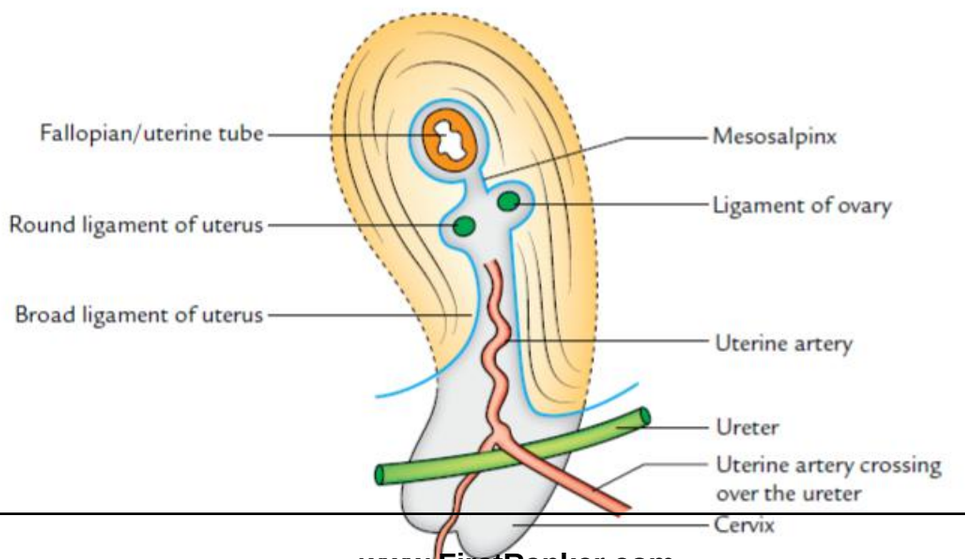
-The mesometrium also encloses the proximal part of the round ligament of the uterus, as well as smooth muscle and loose connective tissue.

Contents of broad ligament

The broad ligament contains the following structures:

1. One tube– Uterine tube.
2. Two ligaments– Round ligament of uterus and Ligament of ovary.
3. Two arteries – Uterine artery and Ovarian artery.
4. Two plexuses of nerves– Uterovaginal plexus and Ovarian plexus.
5. Three embryological remnants– Epoophoron and its duct (Gartner's duct),Paröophoron, Vesicular appendices.
6. Other structures– Lymph vessels and lymph nodes,Fibroareolar tissue, Uterovaginal and ovarian nerve plexuses.





Ligaments of the pelvis(True ligaments)

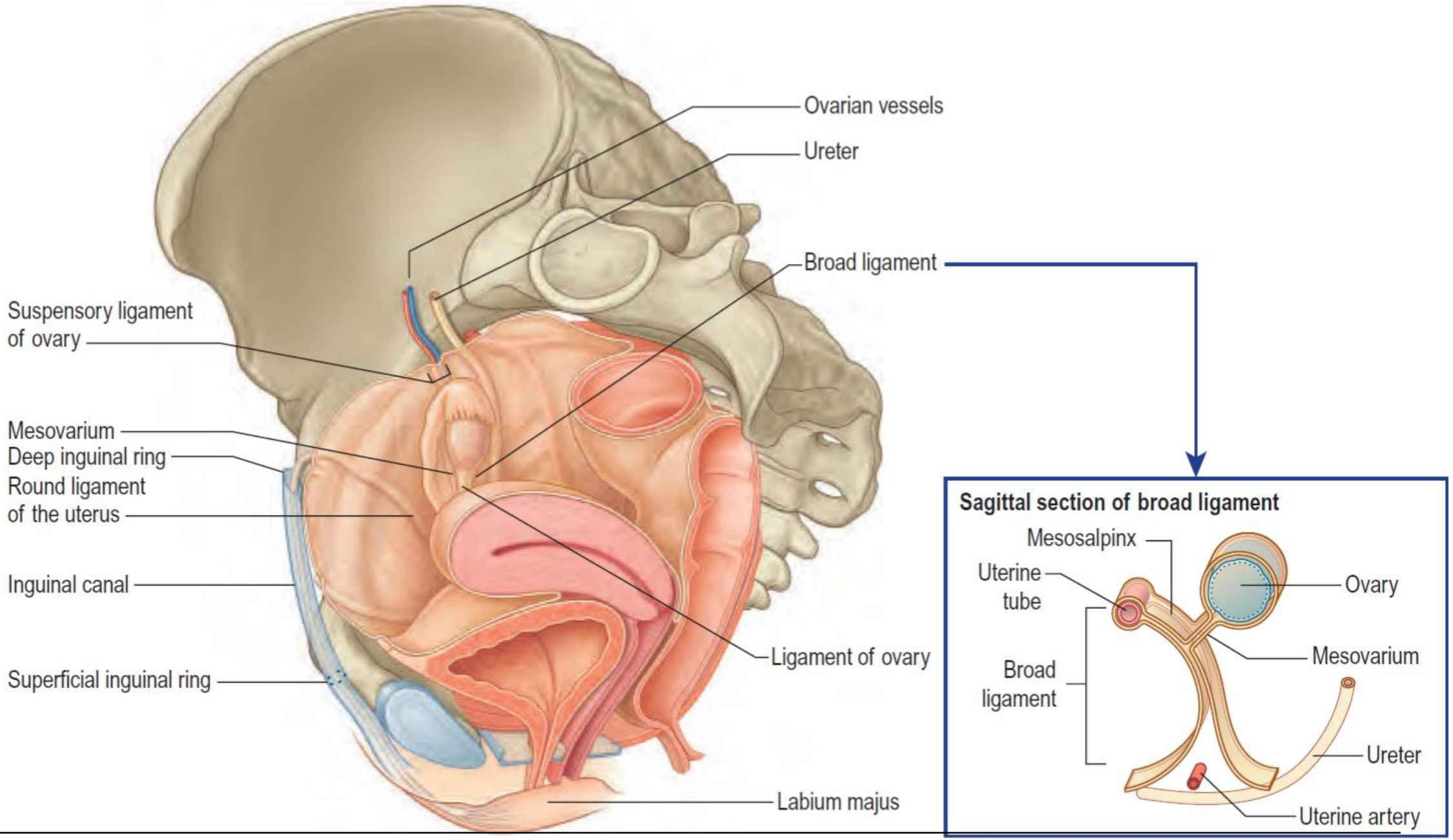
The ligaments of the pelvis consist of the round, uterosacral, transverse cervical and pubocervical ligaments.

Round ligament

-Each round ligament is a narrow smooth muscle band 10–12 cm long, which extends from the lateral cornu of the uterus through the broad ligament to enter the deep inguinal ring lateral to the inferior epigastric artery.

-Near the uterus, the round ligament contains a considerable amount of smooth muscle but this gradually diminishes and the terminal portion is purely fibrous.

-The round ligament also contains striated muscle, blood vessels, nerves and lymphatics. The latter drain the uterine region around the entry of the uterine tube to the superficial inguinal lymph nodes.



-In the fetus, a projection of peritoneum (processus vaginalis) is carried with the round ligament for a short distance into the inguinal canal. This is generally obliterated in adults, although it is sometimes patent even in old age.

-A patent processus vaginalis in the inguinal canal in females is often referred to as the canal of Nuck; it may be asymptomatic or it may give rise to an inguinal hernia or hydrocele of the canal of Nuck.

-In the canal, the ligament receives the same coverings as the spermatic cord, although they are thinner and blend with the ligament itself, which may not reach the mons pubis.

-The round and ovarian ligaments both develop from the gubernaculum and are continuous.

Uterosacral, transverse cervical and pubocervical ligaments

-The uterosacral, transverse cervical and pubocervical ligaments are condensations of the visceral or endopelvic connective tissue that connect the pelvic viscera to the side wall of the pelvis; they radiate like the spokes of a wheel around the hub of the cervix, providing it with considerable support.

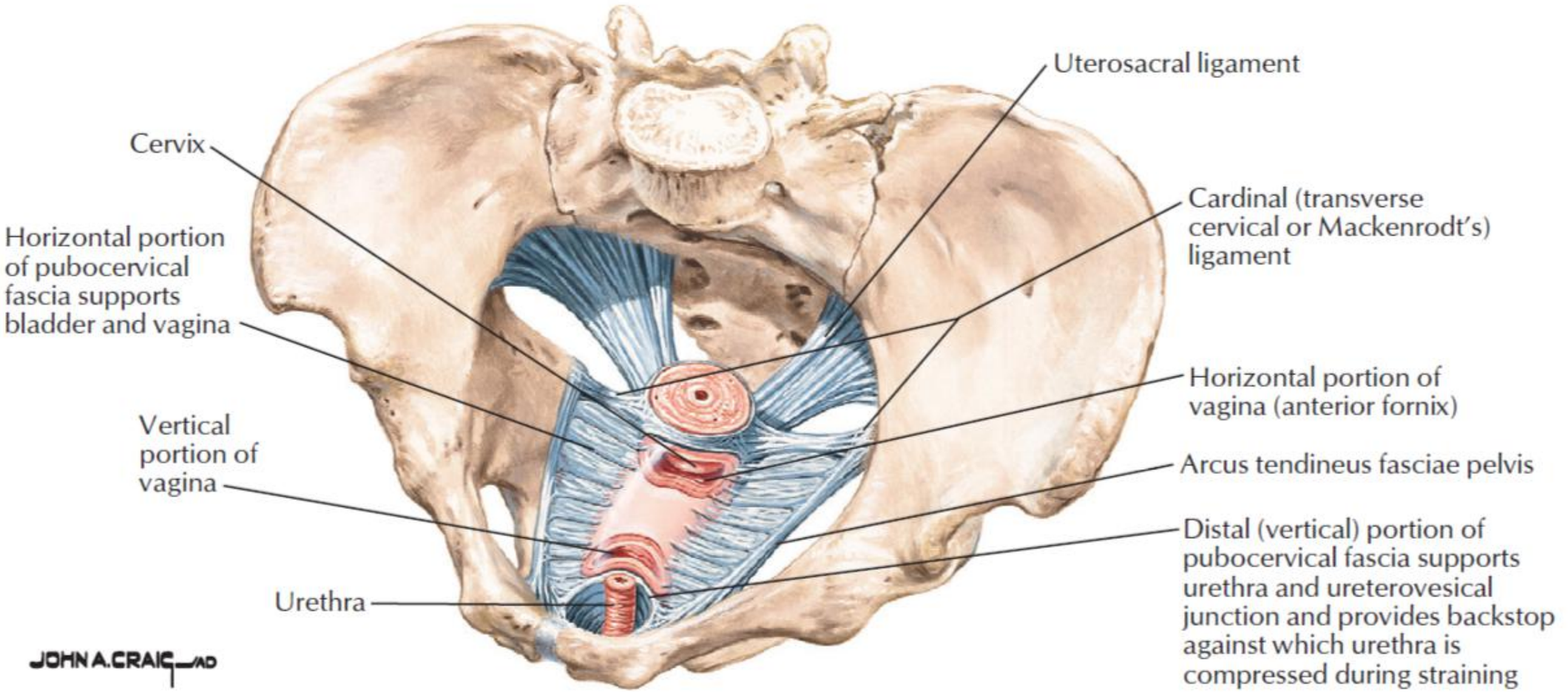
-The connective tissue lateral to the uterus and the cervix – the parametrium – continues down along the vagina as the paracolpium.

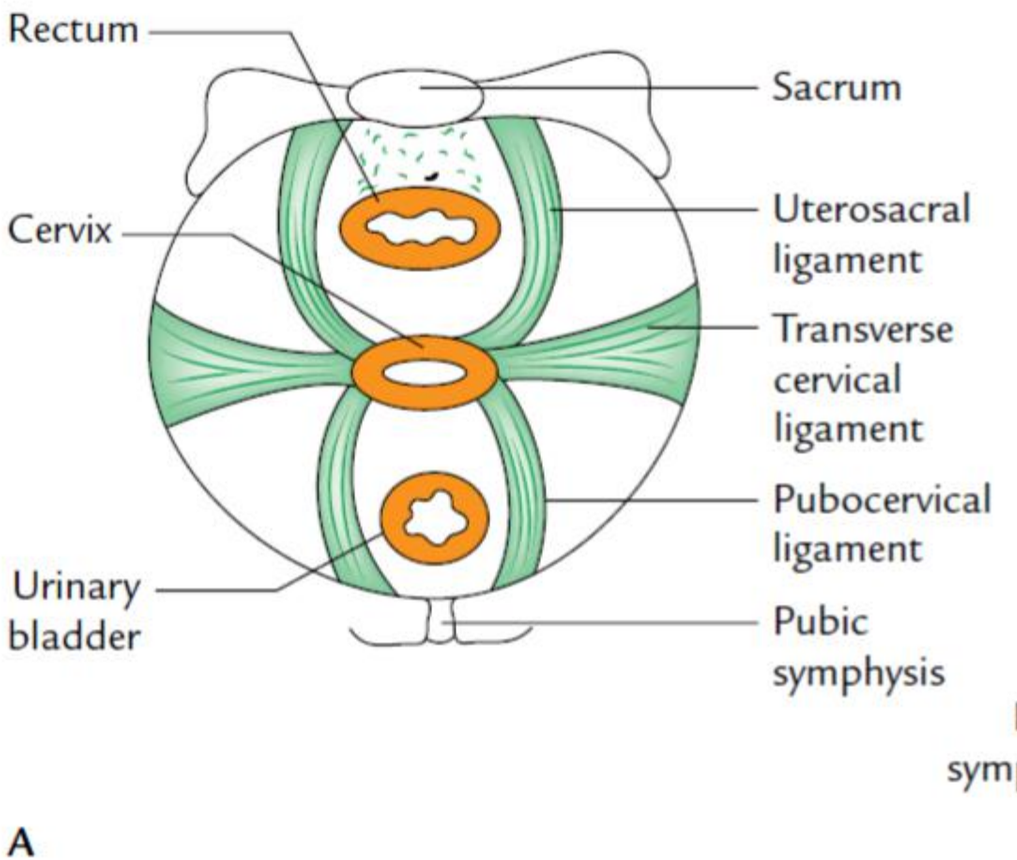
-The uterosacral ligaments contain fibrous tissue and smooth muscle.

-They pass back from the cervix and uterine body on both sides of the rectum, and are attached to the anterior aspect of the sacrum.

-They can be palpated laterally on rectal examination and can be felt as thick bands of tissue passing downwards on both sides of the posterior fornix on vaginal examination.

Pelvic fascia and ligaments





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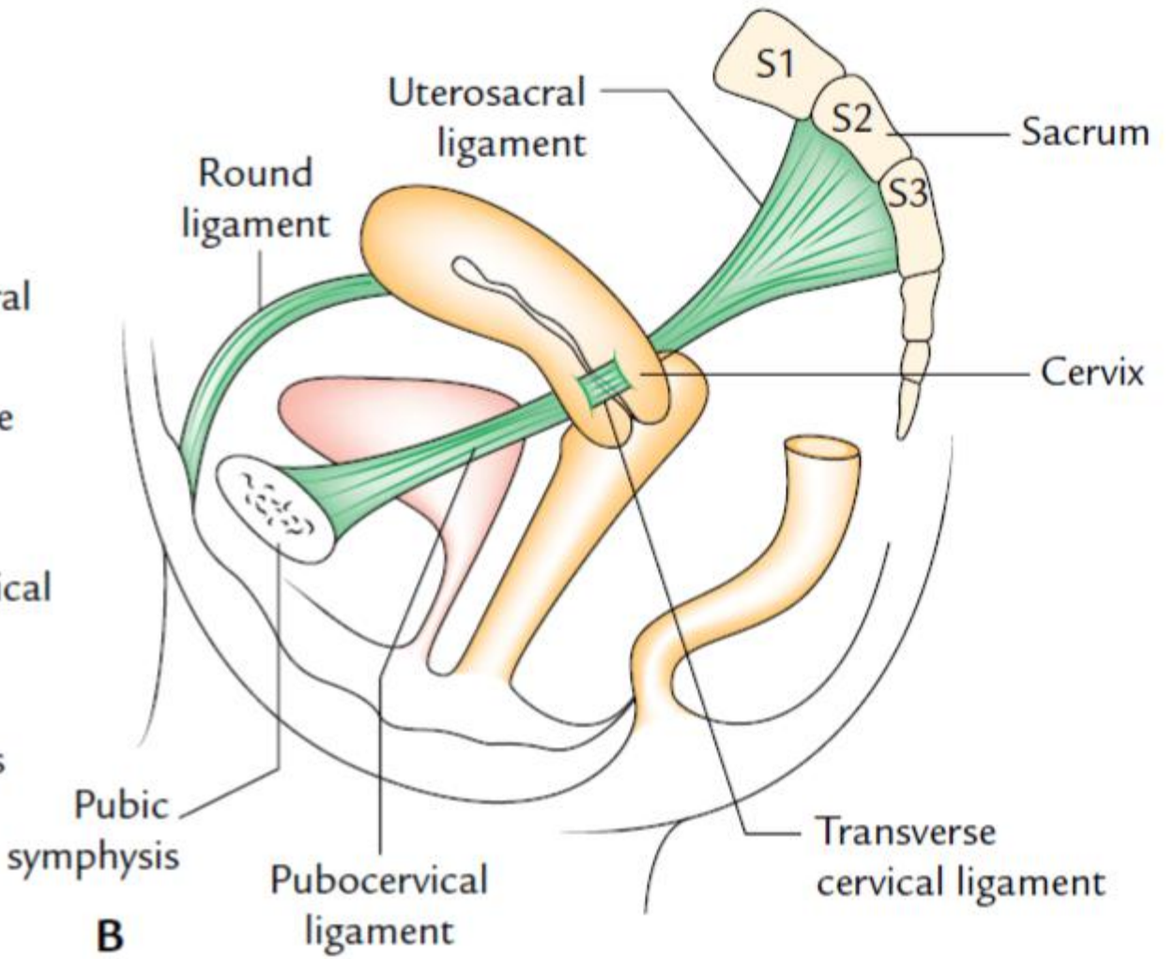

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-The transverse cervical ligaments (cardinal ligaments, ligaments of Mackenrodt) extend from the side of the cervix and lateral fornix of the vagina, and are attached extensively on the pelvic wall.

-The lower parts of the ureters and pelvic blood vessels traverse the transverse cervical ligaments.

-Fibres of the pubocervical ligament pass forwards from the anterior aspect of the cervix and upper vagina to diverge around the urethra, and are attached to the posterior aspect of the pubic bones.

-The transverse cervical and uterosacral ligaments are almost vertically orientated in the standing position and maintain the near-horizontal axis of the upper vagina.

-The uterus and vagina are supported by the close interaction of the uterosacral and transverse cervical ligaments with the muscles of the pelvic floor, including the levatores ani and coccygei, the perineal membrane and the perineal body.

Supports of the uterus

The uterus is kept in position and prevented from sagging down by a number of structures providing support to it. The supports of the uterus are subdivided into two types: chief or primary supports and accessory or secondary supports.

Primary supports

1. Muscular

(a) Pelvic diaphragm

(b) Perineal body .

(c) Urogenital diaphragm

2. Visceral

(a) Urinary bladder .

(b) Vagina .

(c) Uterine axis .

3. Fibromuscular

(a) Transverse cervical ligaments (of Mackenrodt).

(b) Pubocervical ligaments.

(c) Uterosacral ligaments.

(d) Round ligaments of the uterus.

Secondary Supports

1. Broad ligament.

2. Uterovesical fold of peritoneum.

3. Rectovaginal fold of peritoneum.

Vascular supply and lymphatic drainage

Arteries

-The arterial supply to the uterus comes from the uterine artery, which arises as a branch of the anterior division of the internal iliac artery.

-From its origin, the uterine artery crosses the ureter anteriorly in the broad ligament before branching as it reaches the uterus at the level of the cervico-uterine junction.

-One major branch ascends the uterus tortuously within the broad ligament until it reaches the region of the ovarian hilum, where it anastomoses with branches of the ovarian artery.

-Another branch descends to supply the cervix and anastomoses with branches of the vaginal artery to form two median longitudinal vessels: the azygos arteries of the vagina, which descend anterior and posterior to the vagina.

- Although there are anastomoses with the ovarian and vaginal arteries, the dominance of the uterine artery is indicated by its marked hypertrophy during pregnancy.

-The tortuosity of the vessels as they ascend in the broad ligaments is repeated in their branches within the uterine wall.

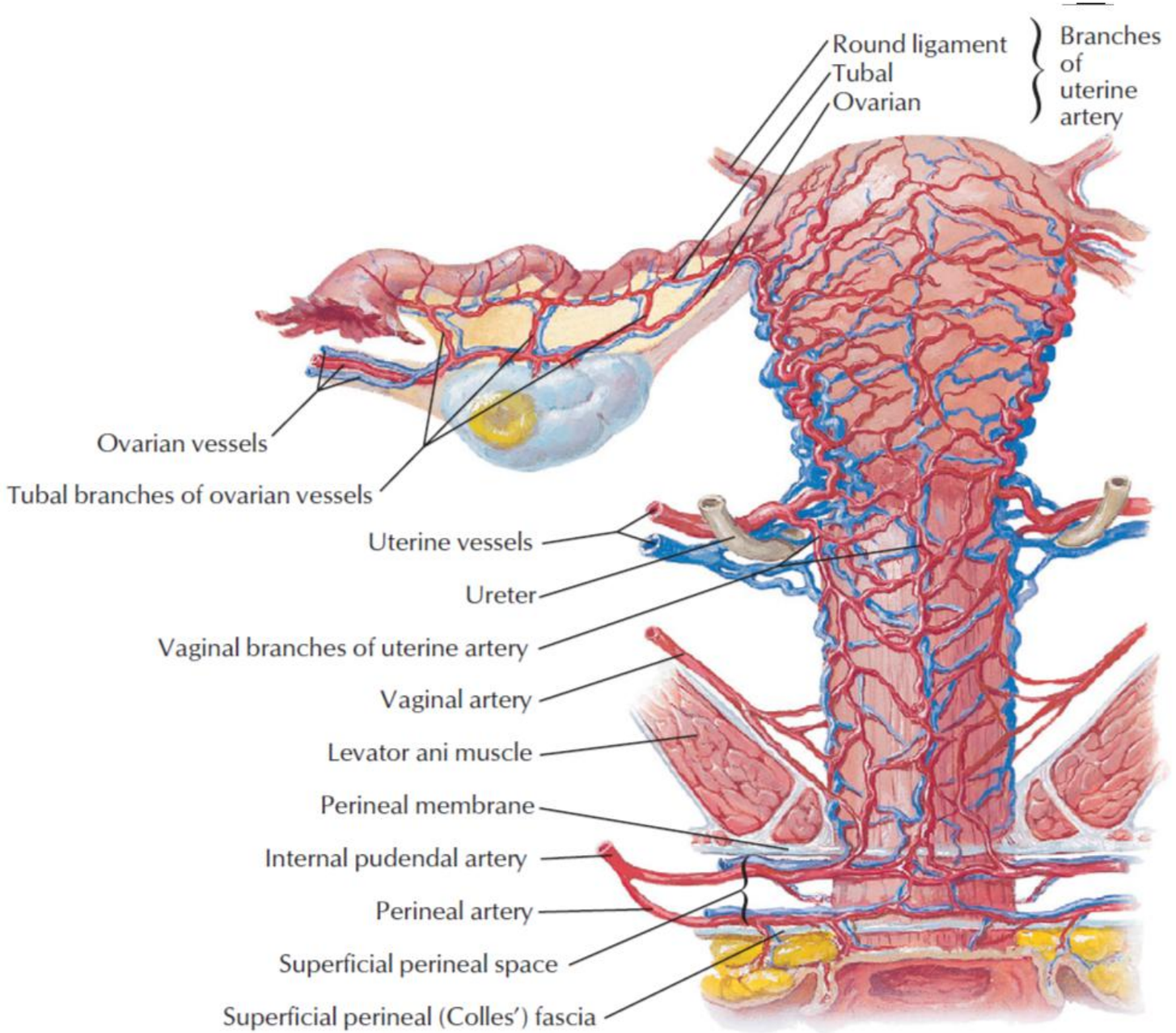
-Each uterine artery gives off numerous branches.

-These enter the uterine wall, divide and run circumferentially as groups of anterior and posterior arcuate arteries. They ramify and narrow as they approach the anterior and posterior midline so that no large vessels are present in these regions.

-However, the left and right arterial trees anastomose across the midline and unilateral ligation can be performed without serious effects. Terminal branches in the uterine muscle are tortuous and are called helicine arterioles. They provide a series of dense capillary plexuses in the myometrium and endometrium.

-From the arcuate arteries, many helical arteriolar rami pass into the endometrium. Their detailed appearance changes during the menstrual cycle.

-In the proliferative phase, helical arterioles are less prominent, whereas they grow in length and calibre,becoming even more tortuous in the secretory phase.



Veins

-The uterine veins extend laterally in the broad ligaments, running adjacent to the arteries and passing over the ureters.

-They drain into the internal iliac veins .

-The uterine venous plexus anastomoses with the vaginal and ovarian venous plexuses.

Lymphatic drainage

-Uterine lymphatics exist in the superficial (subperitoneal) and deep parts of the uterine wall.

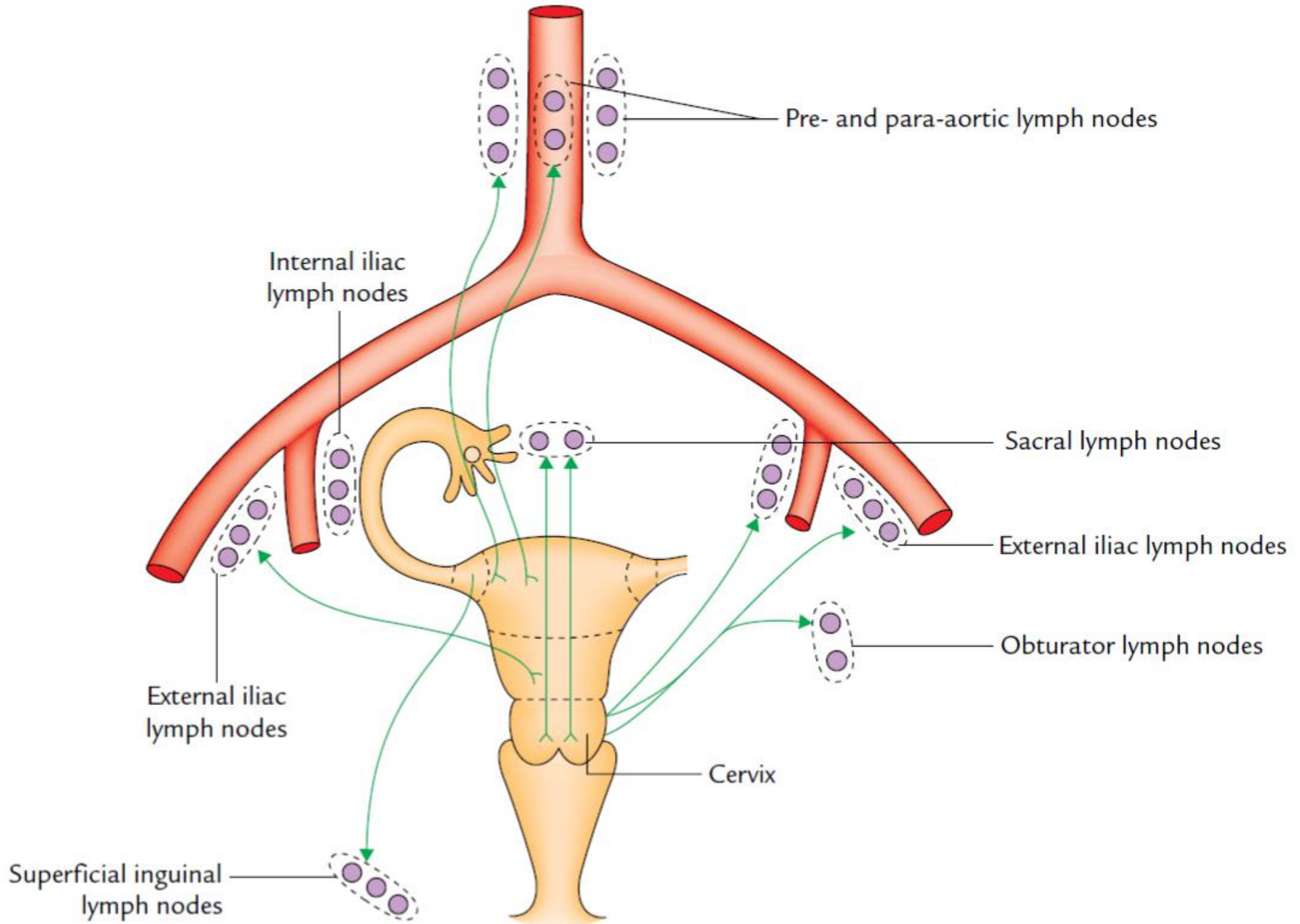
-Collecting vessels from the body of the uterus and cervix pass laterally in the parametrium to three main groups of lymph nodes: the external and internal iliac and the obturator nodes.

-The external and internal iliac nodes surround their corresponding arteries.

-The obturator nodes lie in the obturator fossa between the external and internal iliac vessels; the obturator nerve passes through the lower part of this group of lymph nodes.

-Lymph vessels from the fundus of the uterus and the uterine tubes may accompany the lymph drainage of the ovaries to para-aortic nodes .

- The region surrounding the isthmus of the uterine tube may drain along the round ligament to the superficial inguinal nodes.



Innervation

-The nerve supply to the uterus is predominantly from the inferior hypogastric plexus.

- Some branches ascend with, or near, the uterine arteries in the broad ligament.
- They supply the uterine body and tubes, and connect with tubal nerves from the inferior hypogastric plexus and with the ovarian plexus.
- The uterine nerves terminate in the myometrium and endometrium, and usually accompany the vessels.
- Nerves to the cervix form a plexus that contains small paracervical ganglia. Sometimes, one ganglion is larger and is termed the uterine cervical ganglion.
- Branches may pass directly to the cervix uteri or may be distributed along the vaginal arteries.
- Efferent preganglionic sympathetic fibres are derived from neurons in the last thoracic and first lumbar spinal segments.
- Preganglionic parasympathetic fibres arise from neurons in the second to fourth sacral spinal segments and relay in the paracervical ganglia.
- Sympathetic activity may produce uterine contraction and vasoconstriction, and parasympathetic activity may produce uterine inhibition and vasodilation, but these activities are complicated by hormonal control of uterine functions.

THANK YOU….