



GENITOURINARY SYSTEM

SUBJECT : Anatomy

LEC NO. : 8

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GUS..

Lecture (8)

Anatomy of the Female Reproductive System (1)

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ILOs

- 1. Understand the anatomy of the breast, blood & nerve supply, and lymphatic drainage..**
- 2. Discuss the location, shape, relations, blood & nerve supply, and lymphatic drainage of ovary.**
- 3. Describe the anatomy of uterine tube.**

Breast

It includes the following components:

- Mammary gland.
- The superficial fascia that splits to anterior and posterior lamellae to enclose the mammary gland.
- The overlying skin including the nipple and areola.

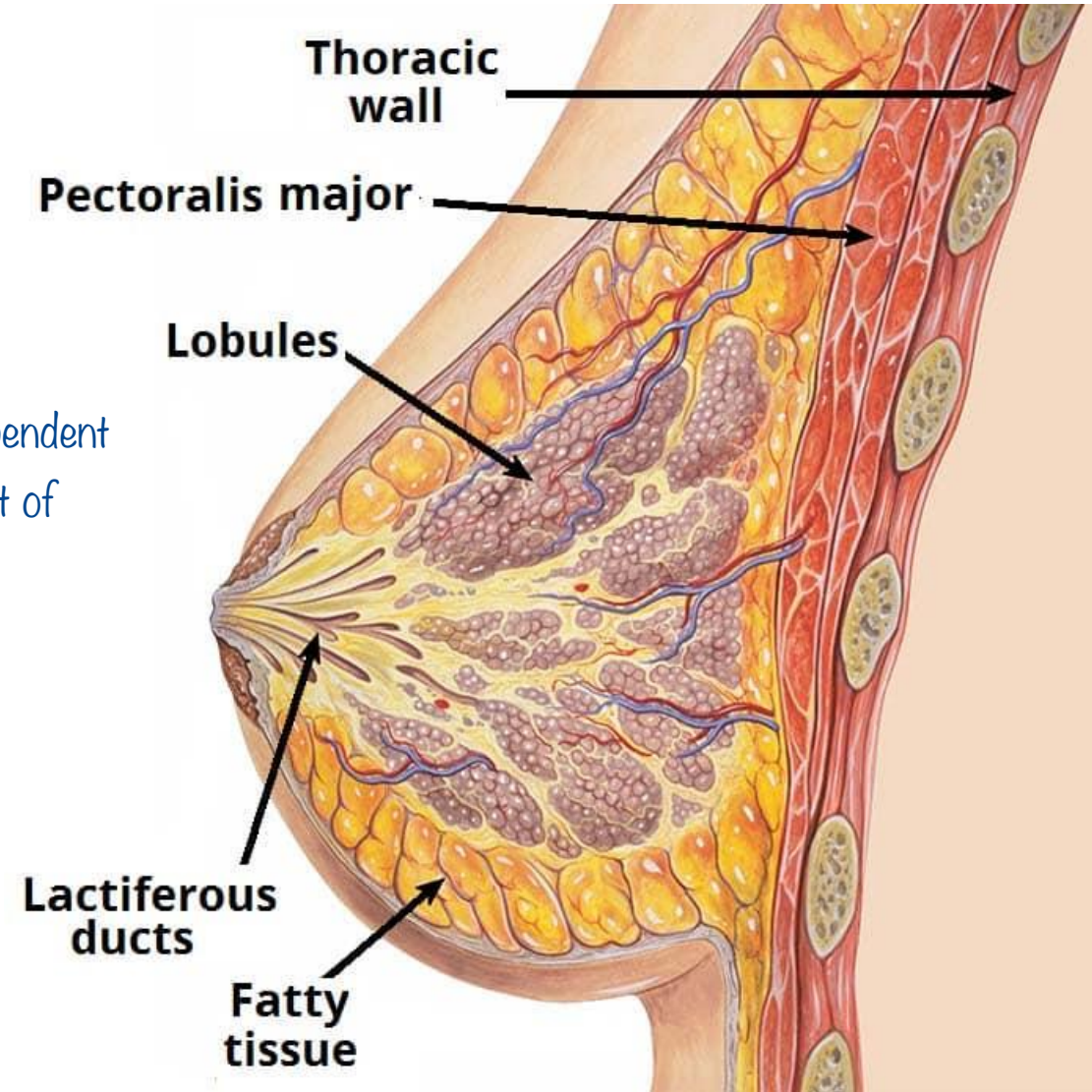
*Fat appears after puberty, it's hormonal dependent (increases in size and amount), development of mammary gland within fascia

Sex difference:

- Present in both sexes.
- Rudimentary in male, well developed in female after puberty.

Shape:

- Conical or spherical.

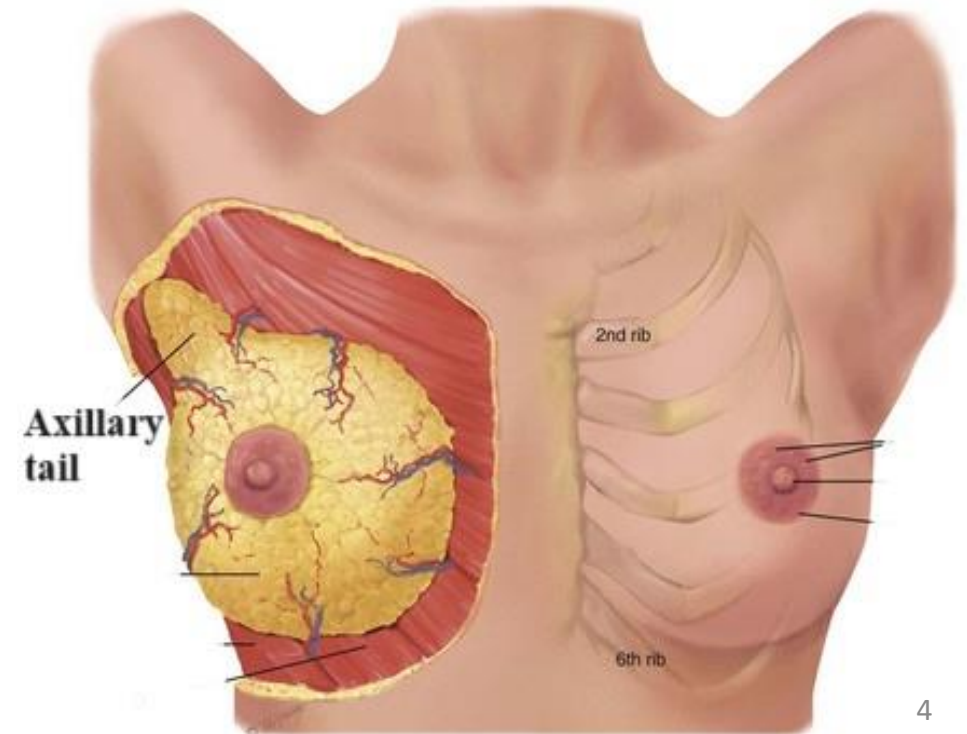
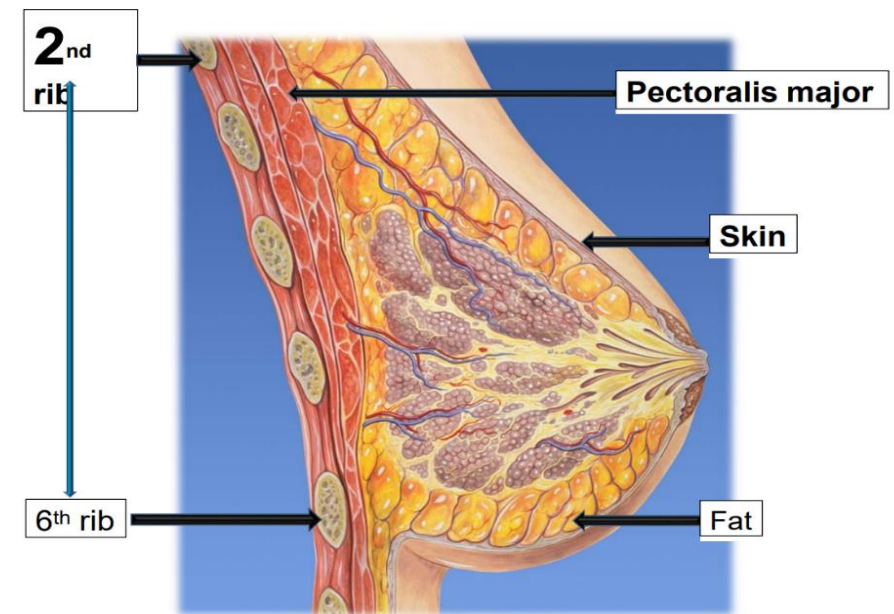


Location and Extent:

- Situated within the superficial fascia of pectoral region.
- It has small extension called axillary tail of breast.

Base of breast Extent:

- Vertically: 2nd to 6th ribs.
- Horizontally: Lateral border of sternum to mid-axillary line.

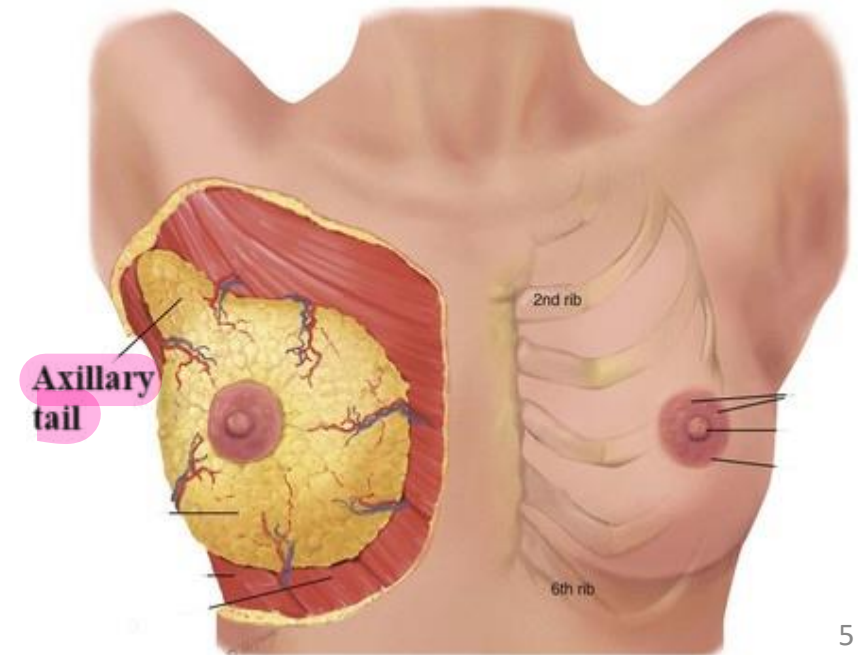
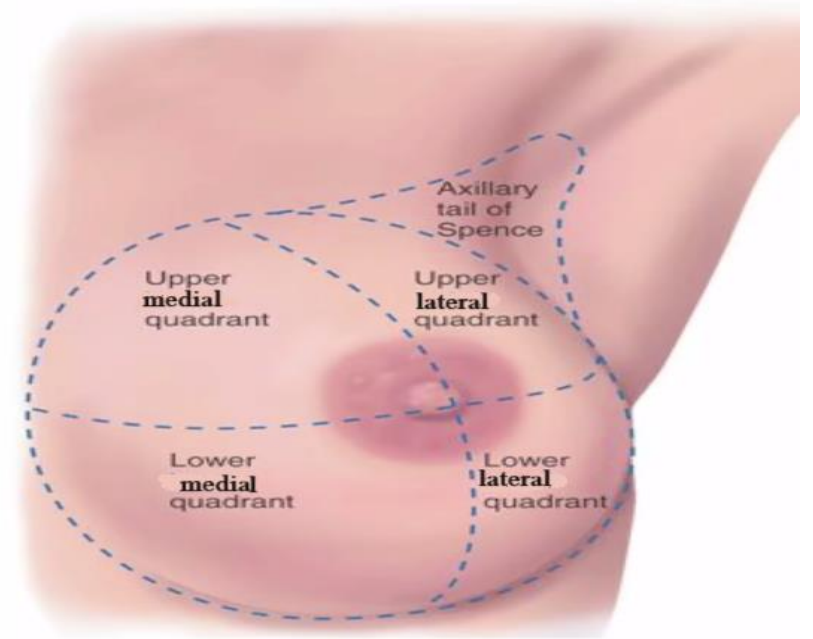


* Breast is divided into 4 quadrants » upper medial and lateral, lower medial and lateral

Axillary tail (axillary tail of Spence):

- It extends upward and laterally from upper lateral part of the gland.
- It passes through an opening in the deep pectoral fascia is known as (foramen of langer) and enters the axilla.

↖ Pierces the pectoral fascia

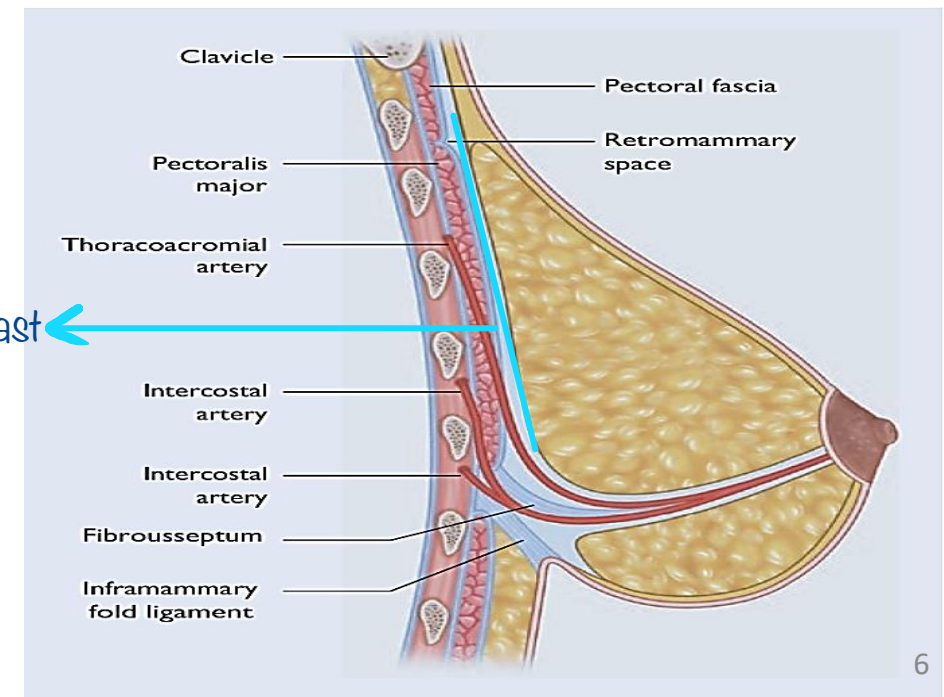
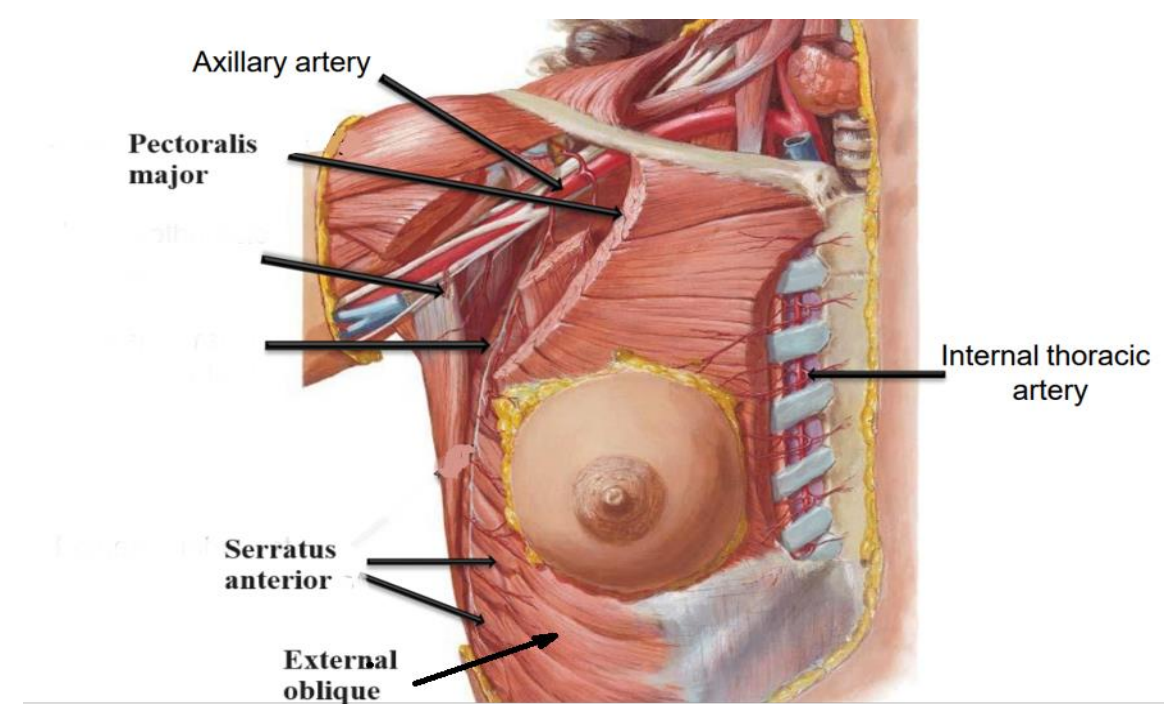


Deep relations of breast (Floor):

Base of breast overlies the following structures:

* Muscle bed, floor of the breast :

- **Pectoralis major** with its covering pectoral fascia. * When examining the breast if it wasn't mobile / fixed this is a sign that there might be cancer
- The breast is separated from pectoral fascia by the loose areolar connective tissue (**retromammary space**), Allowing the free mobility of the breast over the pectoralis major.
- **Serratus anterior** (deep to lateral part).
- **External oblique muscle of the abdomen** (deep to lower part of the gland).



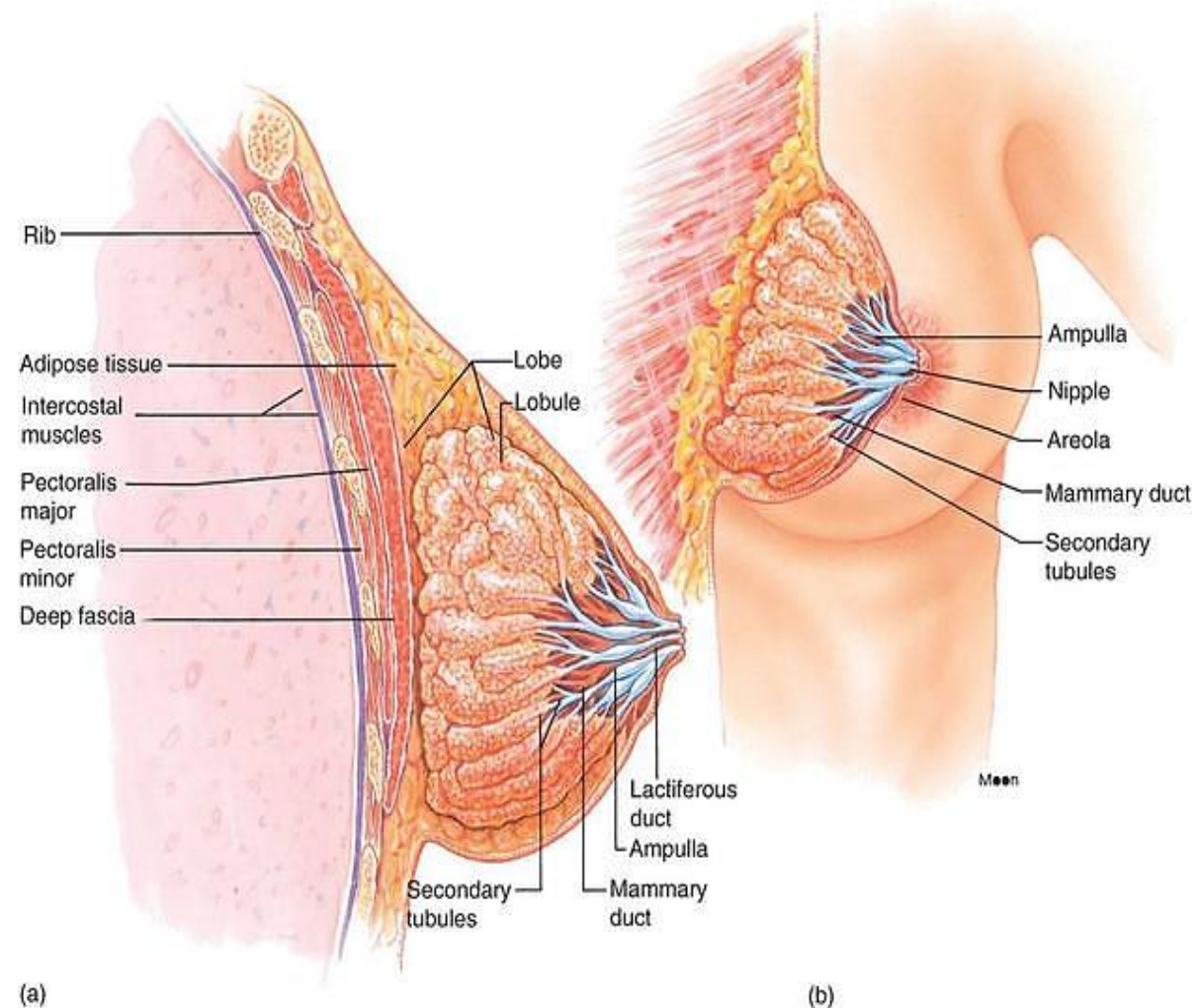
Skin of the breast showing the followings:

The nipple:

- It is conical projection from the centre of the breast.
- Lies opposite the 4th intercostal space, just lateral to the midclavicular line.
- It carries the opening of lactiferous ducts (15-20).
- The subcutaneous tissues of nipple is devoid of fat.

Areola:

- Pigmented area of skin that surrounds the base of the nipple.



Structure of Breast:

The stroma:

a) Fibrous stroma:

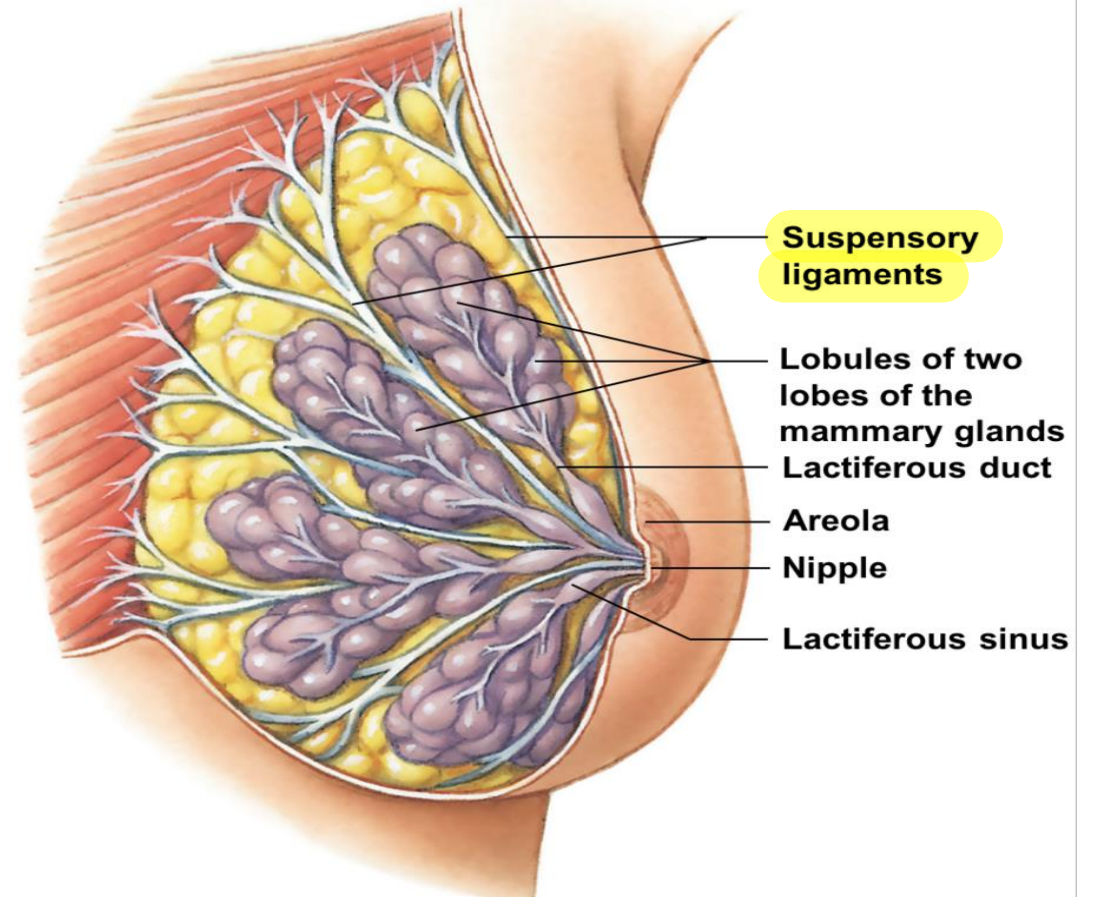
- Forms fibrous septa known as **suspensory ligaments of Cooper**, divide the gland into lobes.

b) Fatty stroma:

- Forms the **main bulk of the gland**.

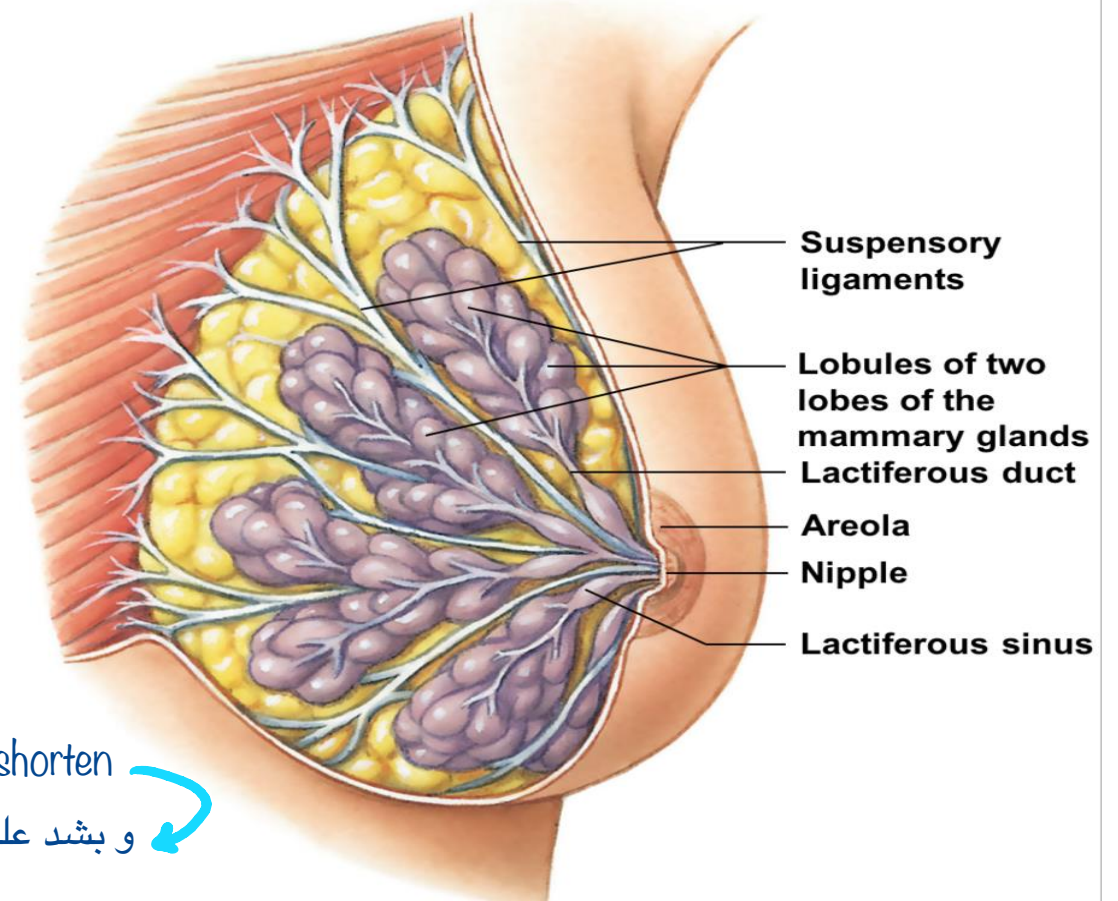
Parenchyma (Mammary gland):

- Each mammary gland consists of **15–20 lobes of glandular tissue**.
- Each lobe has a **lactiferous duct**.
- Each lactiferous duct **dilates under the areola to form lactiferous sinus** and then opens on the nipple.



Suspensory Ligament of Cooper:

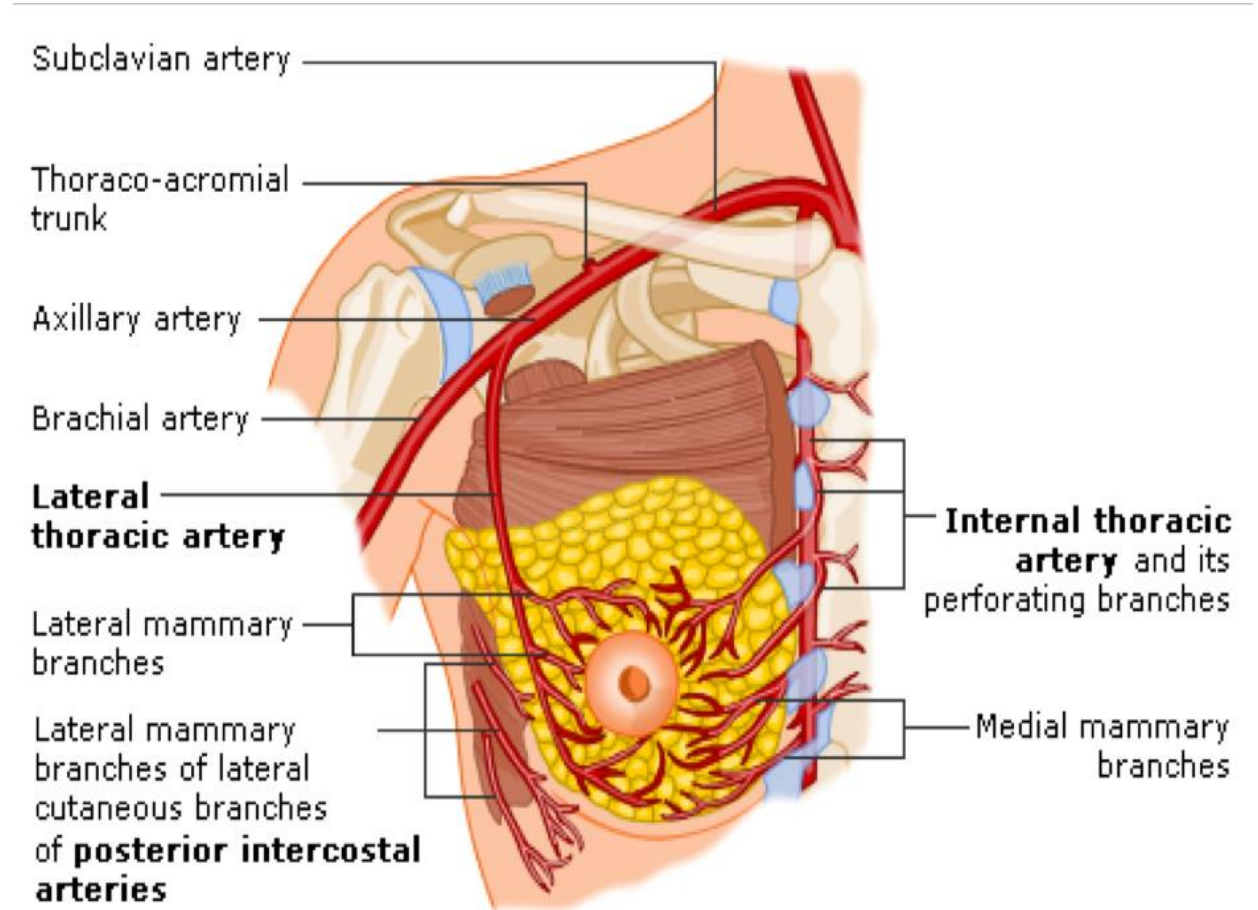
- Run throughout the breast tissue from the pectoral fascia and attach to the dermis of the skin.
- Relax with age and time, eventually resulting in breast ptosis.



* If these ligaments undergo invasion of cancerous cells they will start to shorten
و بشد علی ال dermis of the skin و بظهر علی شکل dimple

Arterial Supply of Breast:

1. **Axillary artery** through:
Lateral thoracic artery (supply the lateral aspect of the breast).
2. The **perforating branches of internal thoracic artery** to the anteromedial part of the breast.
Internal mammary artery branch of subclavian artery, descends along the lateral border of sternum at each side
3. The **perforating branches of second to fourth anterior intercostal arteries**.



Venous drainage of Breast into:

- Axillary, internal thoracic and intercostal veins via veins that accompany the corresponding arteries.
- Intercostal veins communicate with the vertebral veins. This route is responsible for metastasis of breast cancer to vertebral bodies.

The breast is innervated by:

- Fourth to sixth intercostal nerves, by their anterior & lateral cutaneous branches.
- Secretory activities of the gland are largely controlled by prolactin & ovarian hormones.

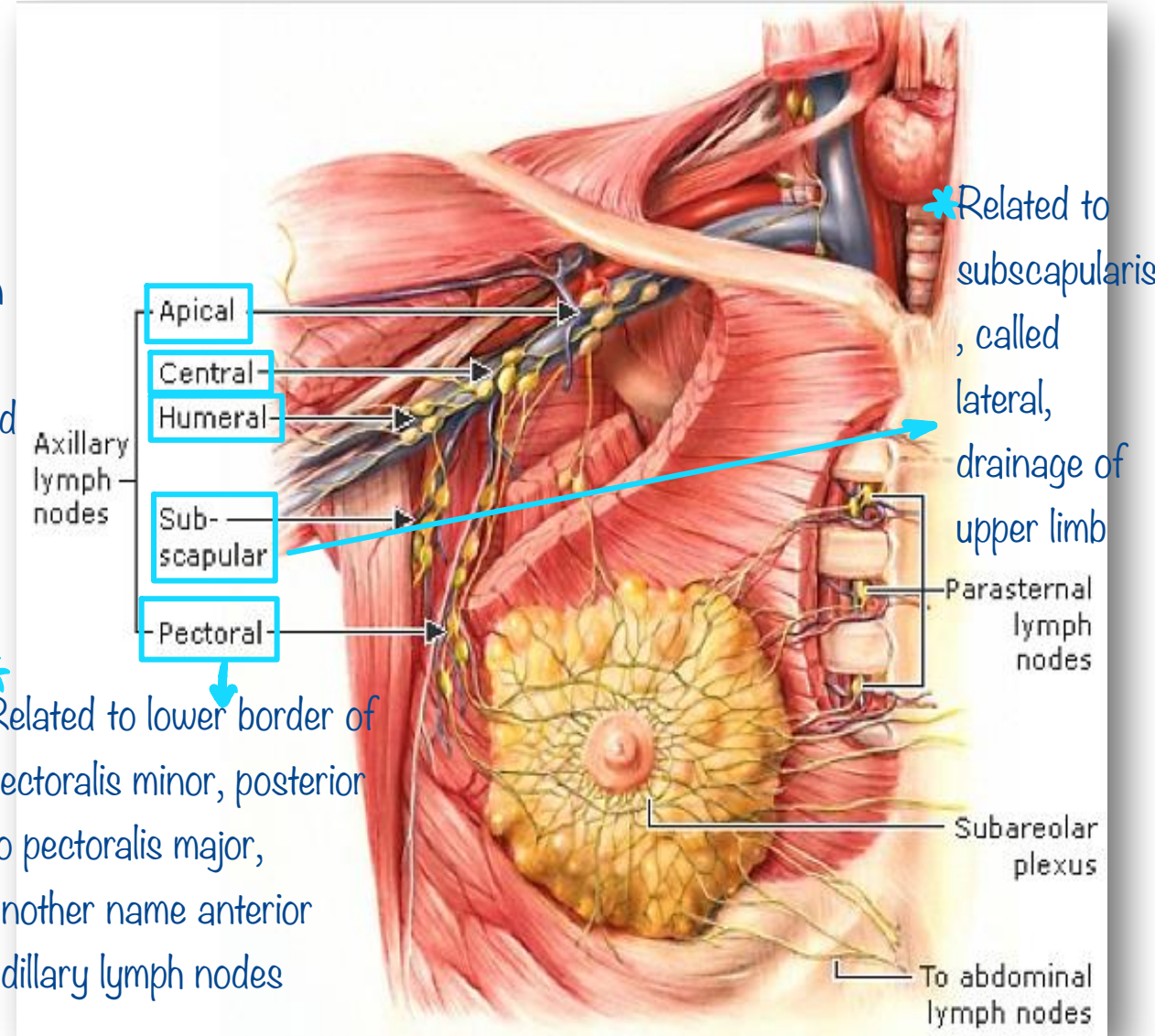
Lymphatic drainage of breast:

Lymphatic vessels:

- **Subcutaneous plexus.**
- **Subareolar plexus of Sappey drain nipple & areola.**
 - * Any breast with cancer with invasion of lymphatic vessels » skin of the breast will be edematous, there's fixed points of the skin doesn't undergo edema which is hair follicles that makes breast look like orange peel
- **Parenchymatous plexus.**
- **Submammary plexus.**

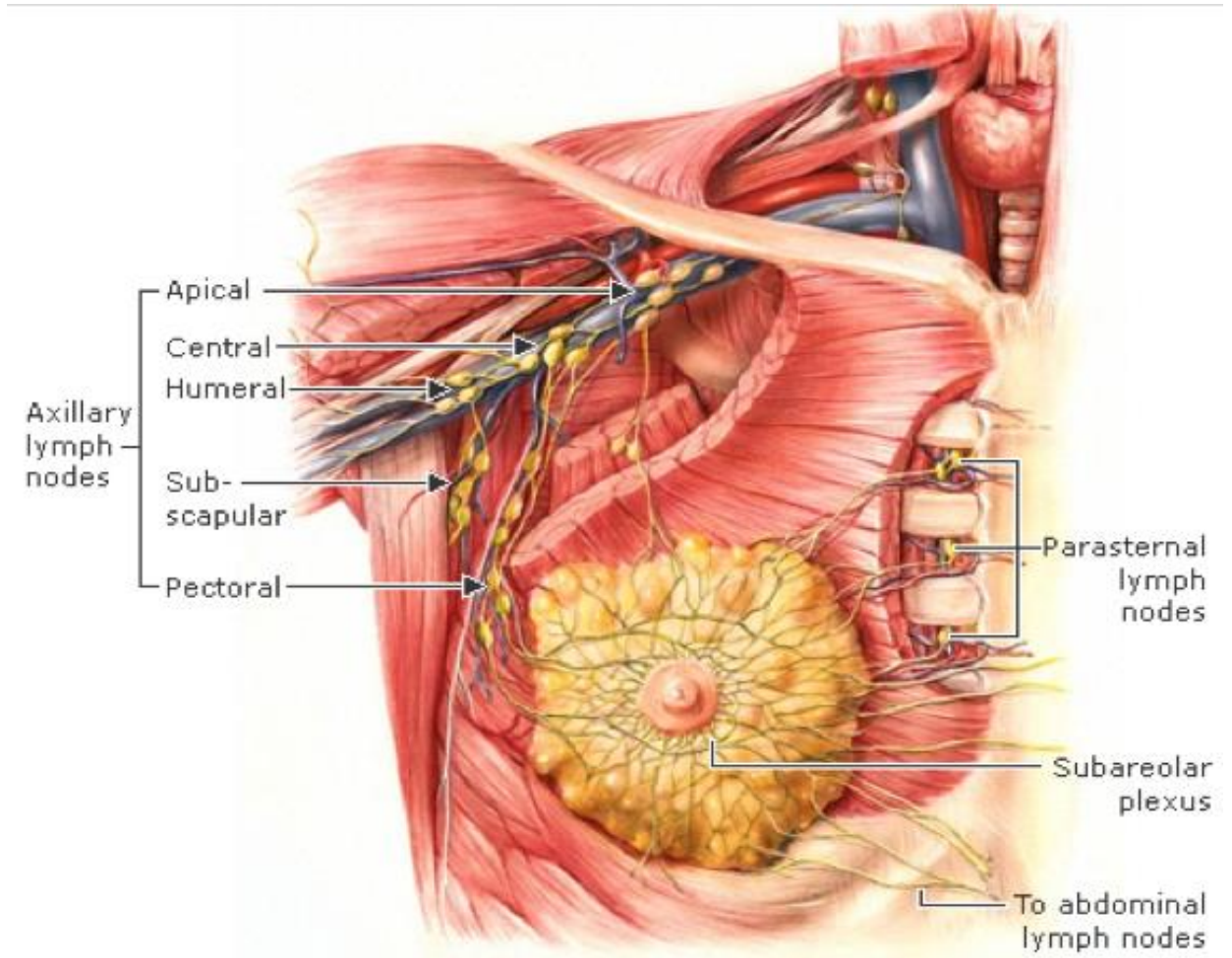
Lymph node station:

- **Axillary nodes** receive **75% -85%** of the lymph
 - * Related to lower border of pectoralis minor, posterior to pectoralis major, another name anterior axillary lymph nodes
- **Internal mammary (parasternal) nodes (10-20%).**
- **Others (5%):** as posterior intercostal, subdiaphragmatic....
 - + Lymphatics of rectus sheath

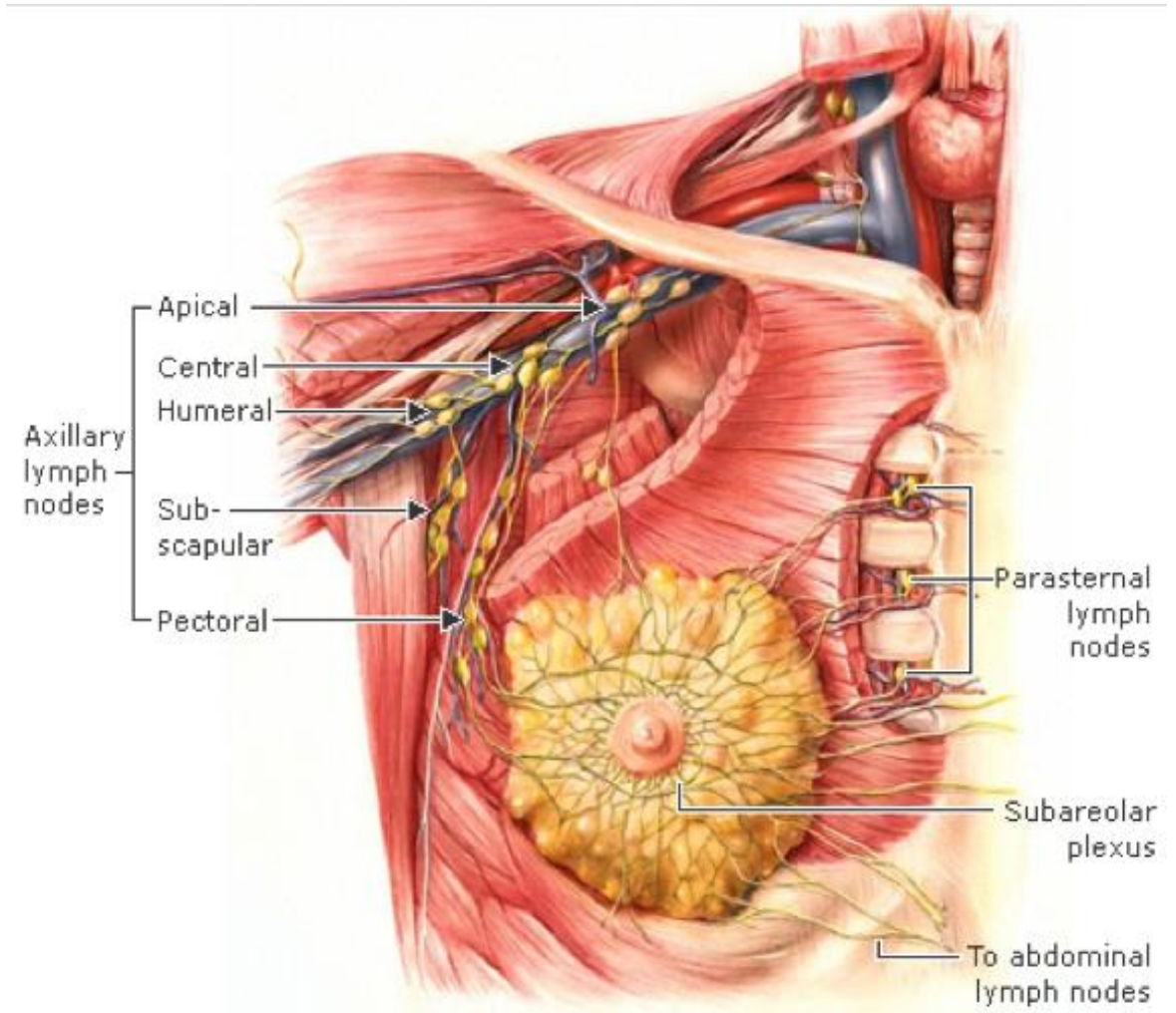


Lymphatic drainage according to the part of breast:

- **Nipple & areola** drain into the **pectoral and apical group of axillary lymph nodes**.
- **Upper lateral quadrants** drains into **apical group of axillary lymph nodes**.
- **Lower lateral quadrant** drain into the **pectoral group of axillary nodes** (situated just posterior to the lower border of the pectoralis major muscle).



- **Upper medial quadrant** the lymphatic vessels that pierce the intercostal spaces and **drain into internal mammary lymph nodes** (situated within the thoracic cavity along the course of the internal thoracic artery).
- Lymphatics from **the lower medial quadrant** of the breast anastomose with the lymphatics of the **rectus sheath and sub-diaphragmatic lymphatics**.
- Lymphatics vessels from the **medial part** of the gland also **cross the midline to anastomose with the lymphatics of the opposite breast**.



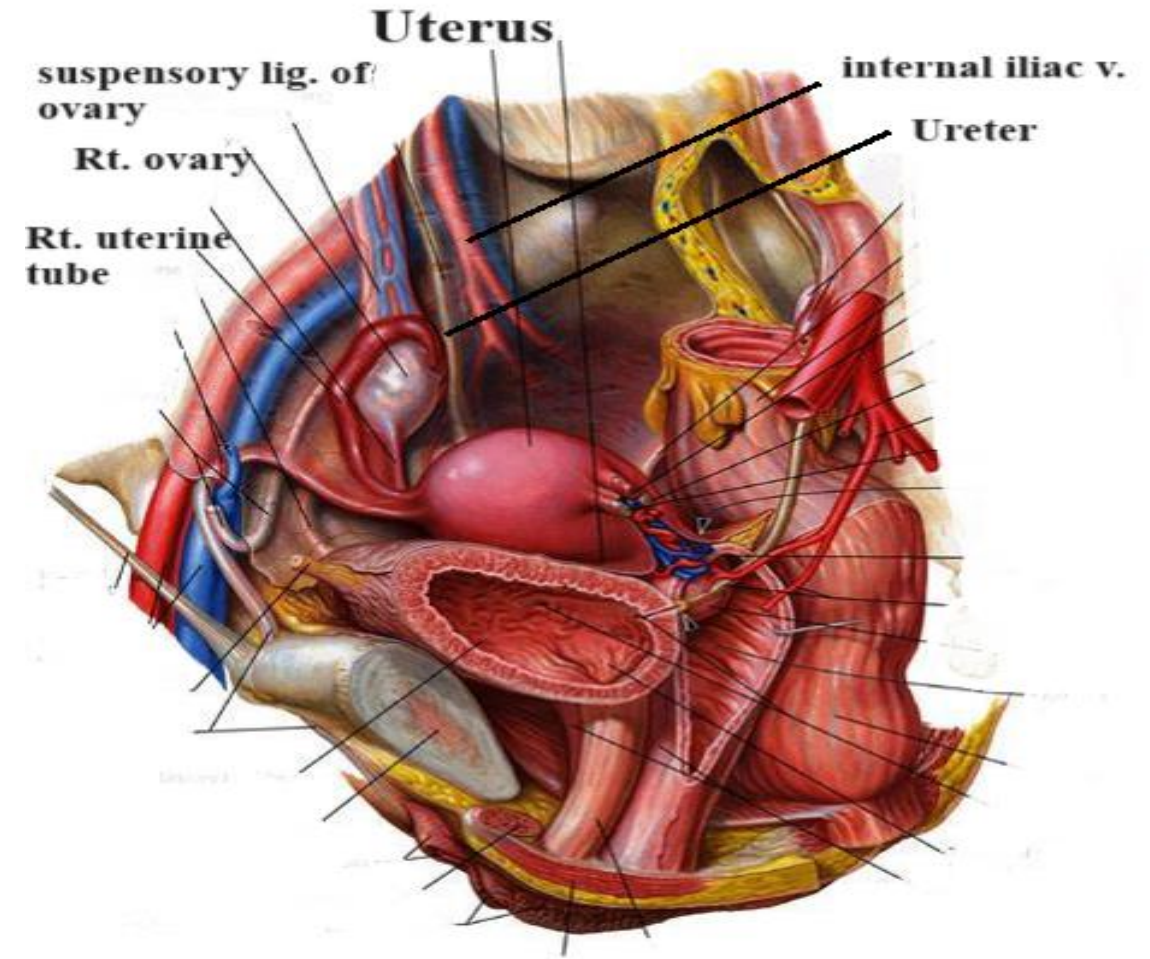
Ovaries

Site:

- The ovaries, one on each side, It lies in a depression, called the **ovarian fossa** at the lateral pelvic wall.
- During pregnancy, the enlarging uterus pulls the ovary up into the abdominal cavity.

Boundaries of ovarian fossa:

- Anterior: External iliac vessels.
- Posterior: Ureter and internal iliac vessels.
- The floor of the fossa: Formed by the obturator internus and obturator fascia.



Shape and size:

- Ovary is an almond-shaped organ.

- Its dimensions; $3 \times 2 \times 1$ cm.

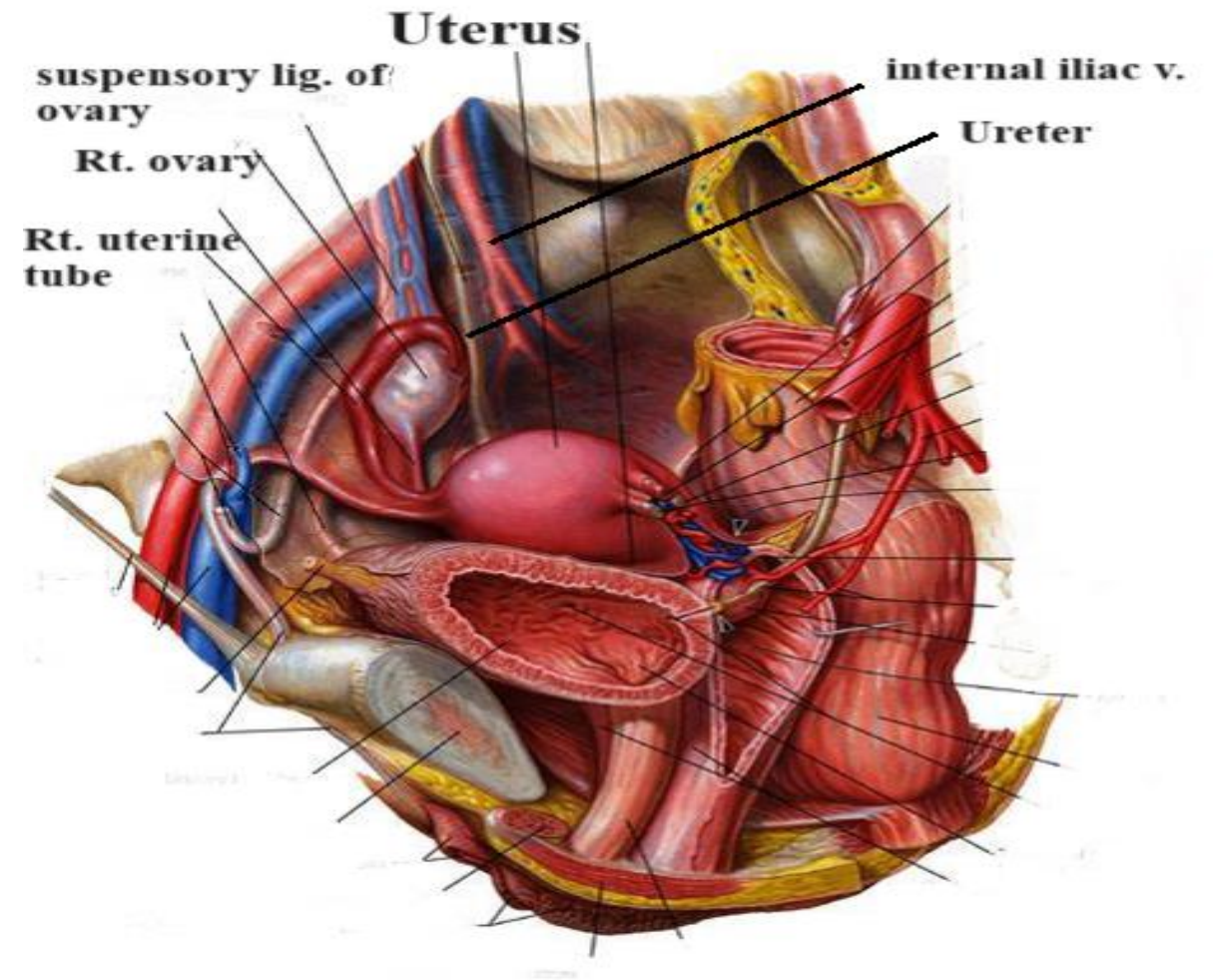
Vertical ← ↓ → Thickness from
Anteroposterior medial to lateral

Description: It has

- Two surfaces; Medial & Lateral.

- Two ends; Upper & Lower.

- Two borders; Anterior & Posterior.



Surfaces of the ovary:

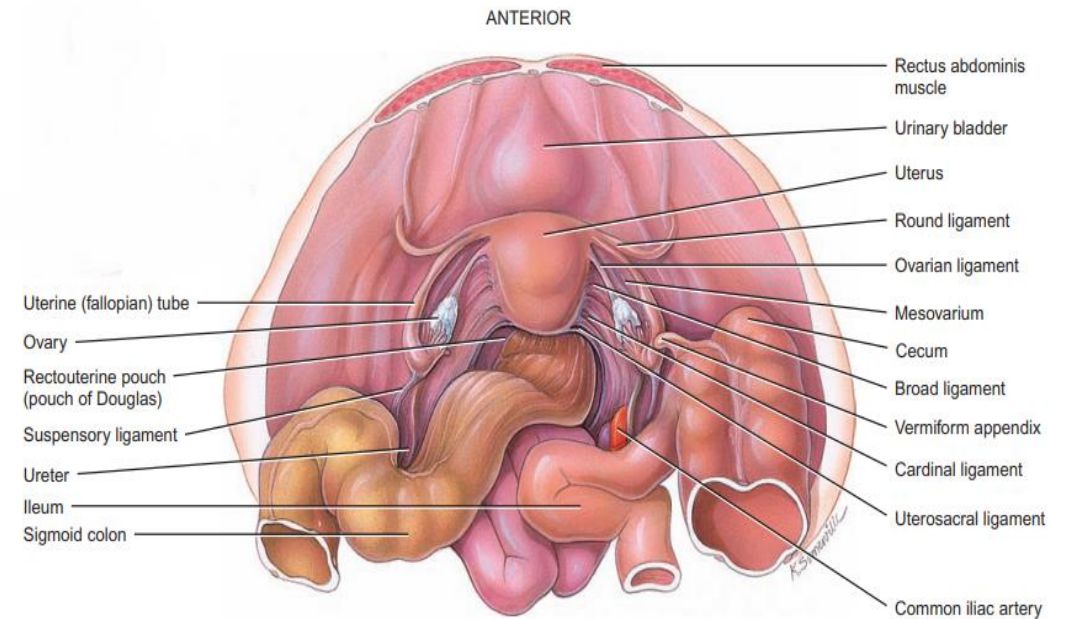
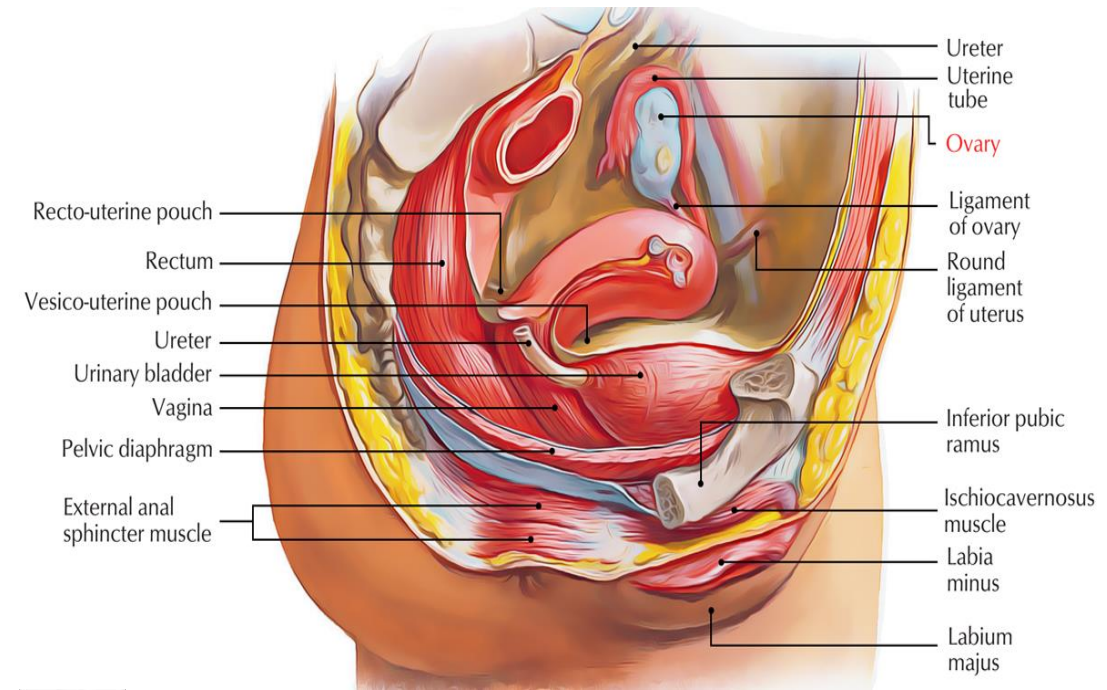
a-The lateral surface:

Which lines lateral pelvic wall

- It is related to the parietal peritoneum of the ovarian fossa, which separates the ovary from obturator muscle and fascia.

b-The medial surface:

- It faces the uterus and its broad ligament



(a) Superior view of transverse section

* Anterior / upper border of broad ligament → free border both layer are continuous with each other

Ends of the ovary:

a-The upper or tubal end of the ovary:

- It is related to the **fimbria of the uterine tube.**
- It is related to the **suspensory ligament of the ovary.**

* uterus is covered by peritoneum from anterior and posterior aspects

b-The lower or uterine end:

- It gives attachment to the **ligament of the ovary.**

* Broad ligament is a peritoneal fold which is double folded

Borders of the ovary:

a-Posterior (free) border:

- It is **toward the ureter.**

b-Anterior (attached) border:

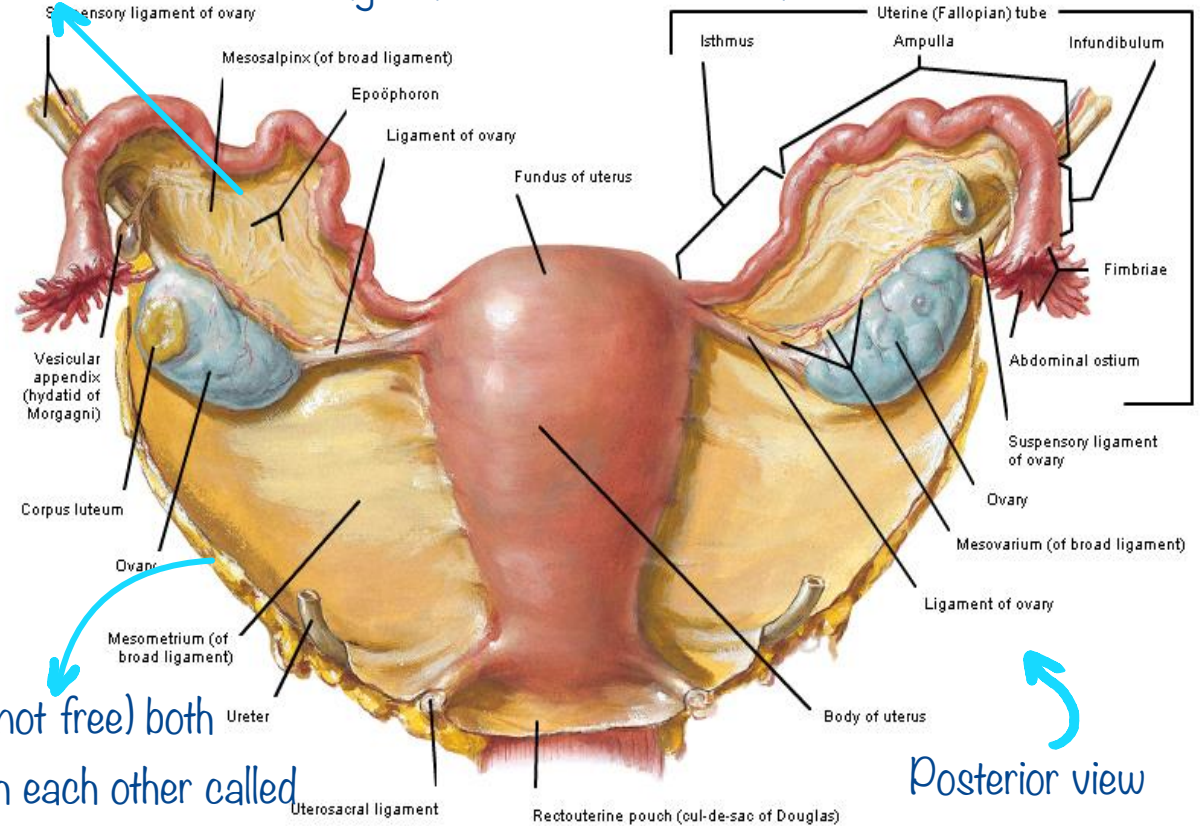
- It is **attached to the mesovarium.**

→ Ovarian ligament

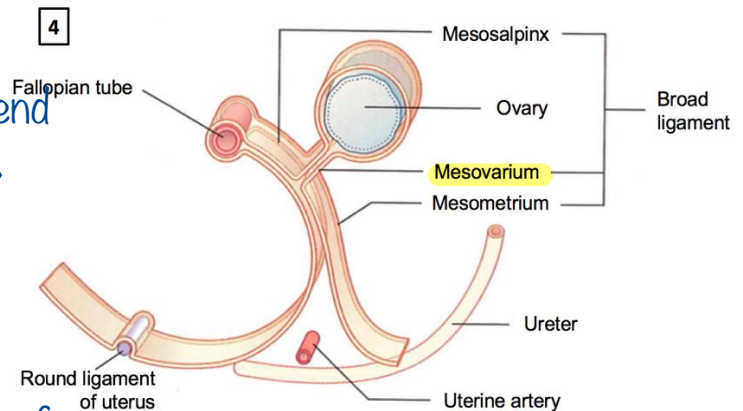
* Lower border → attached (not free) both layers are continuous with each other called root of broad ligament

* Broad ligament has an extension of peritoneal fold that extends from upper end of ovary toward the side of pelvic wall » suspensory ligament of ovary

↘



Posterior view



* Peritoneal fold that runs between 2 layers of it the vessels, blood supply, lymphatics a nerves of ovaries

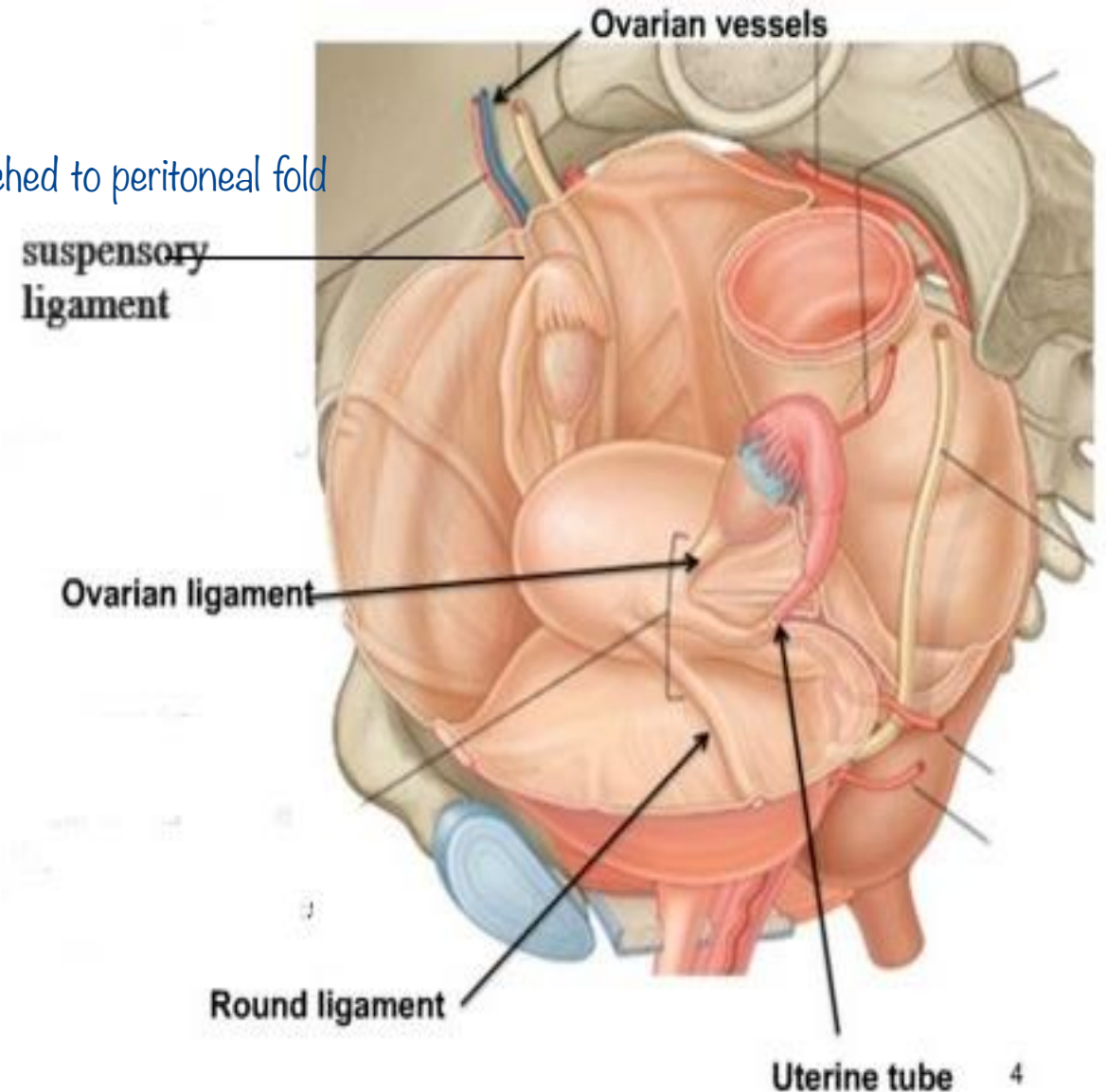
Peritoneal relation of the ovary:

- The ovary is almost completely covered by peritoneum. Anterior border isn't covered by peritoneum it's attached to peritoneal fold
- The peritoneal covering is perforated by the ovum during the ovulation.

Ligaments of ovary:

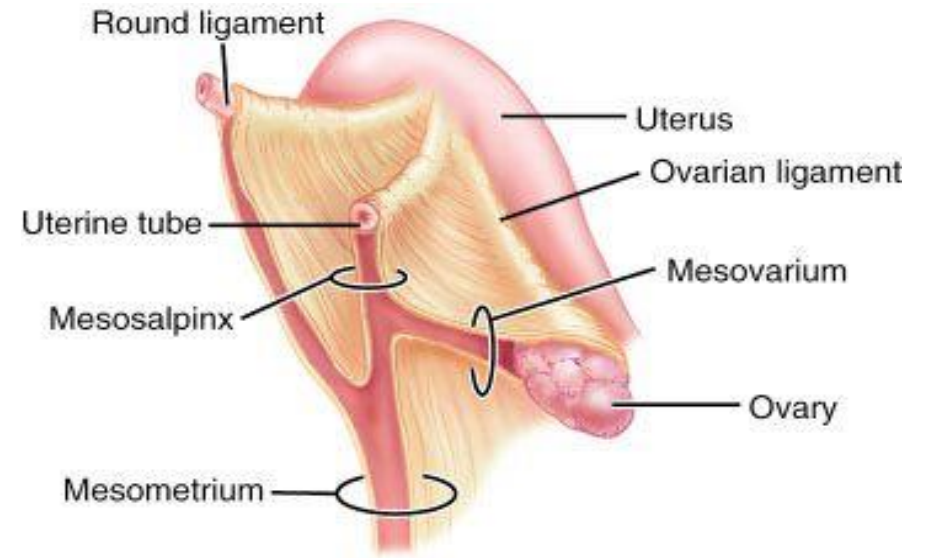
1- Suspensory ligament of the ovary:

- It is part of the broad ligament.
- It extends from the upper end of the ovary to the side wall of the pelvis.
- It transmits the ovarian vessels, nerves and lymphatics.



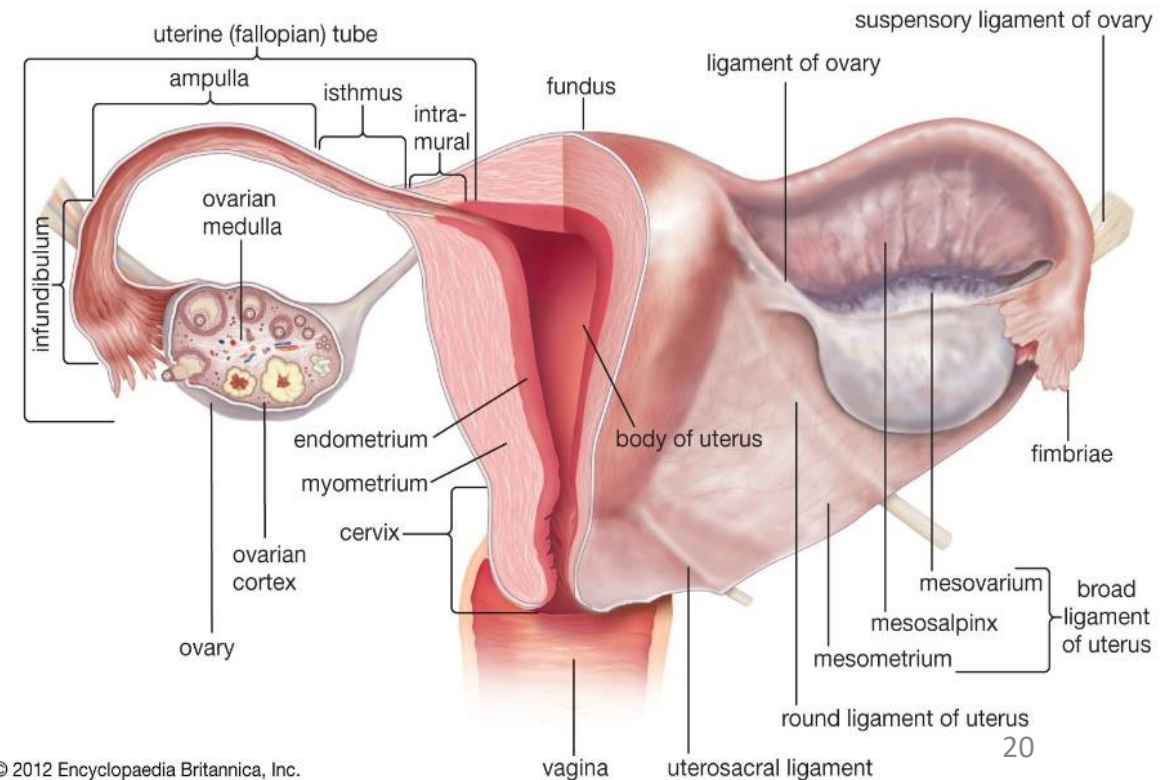
2-Mesovarium:

- It is a **peritoneal fold extending** from the **broad ligament to the anterior border of the ovary.**
- It **transmits** the ovarian vessels and nerves to the ovary.



3-Ovarian ligament:

- It is a **fibromuscular cord extending** from the **uterine end of the ovary to the lateral angle of the uterus.**



Arterial supply of ovary:

a-Ovarian artery:

- It reach ovary through the suspensory ligament and mesovarium.

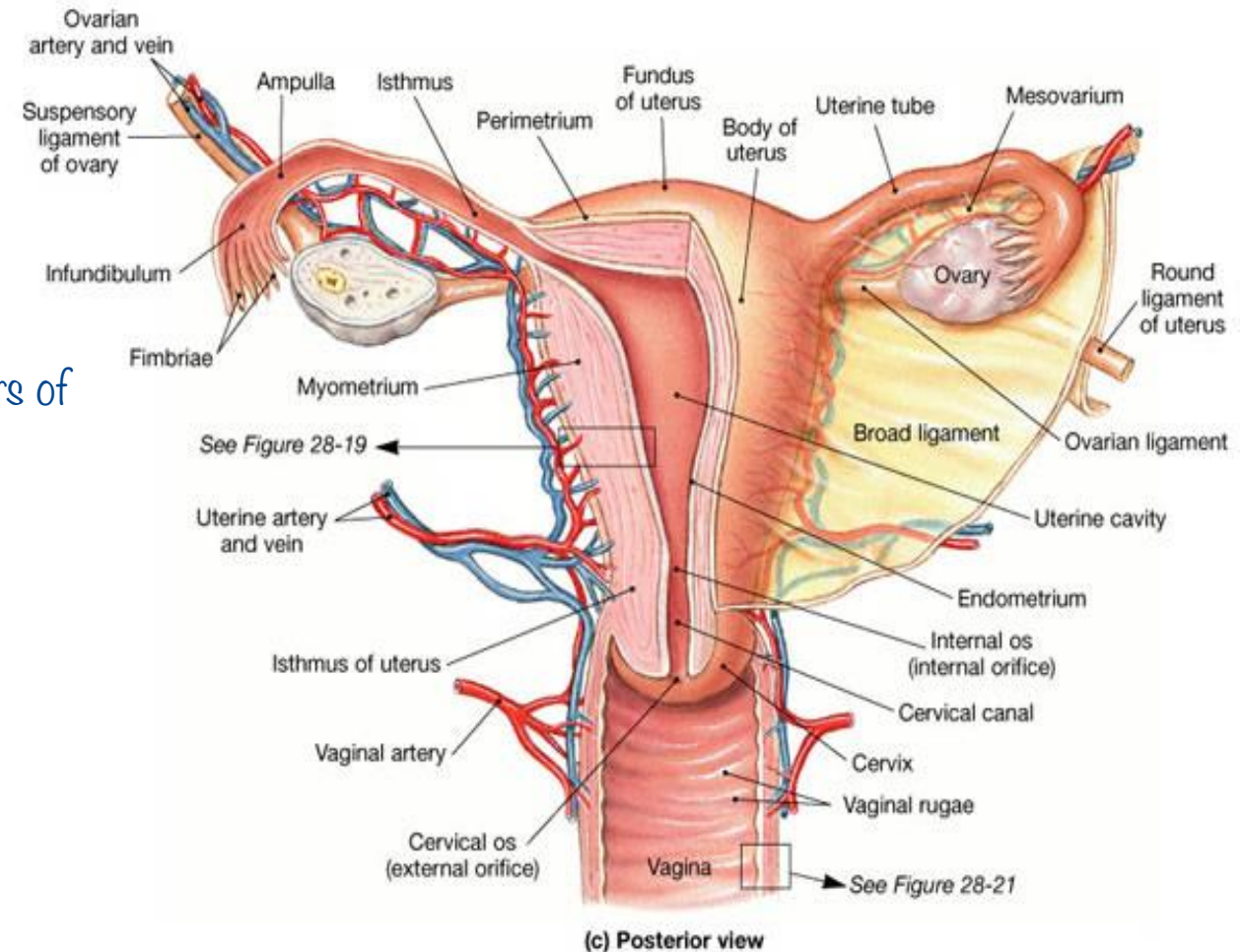
b-Uterine artery:

- It gives additional branches which reach the ovary through the mesovarium.

* Branch of internal iliac artery, runs transversely then between the 2 layers of broad ligament then along the lateral aspect of the uterus, then the lower border of uterine tube then anastomose with ovarian artery

Venous drainage:

- Ovary drains into the pampiniform plexus which drains into the ovarian vein.
- Ovarian veins drain into the inferior vena cava on the right side and to the left renal vein on the left.



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Lymphatic drainage:

- Para- aortic lymph nodes.

Nerve supply:

- Sympathetic fibers are derived from 10th and 11th thoracic segment.
- Parasympathetic fibers from pelvic splanchnic nerve.

Uterine tubes (Fallopian tubes)

It is also called **salpinx**.

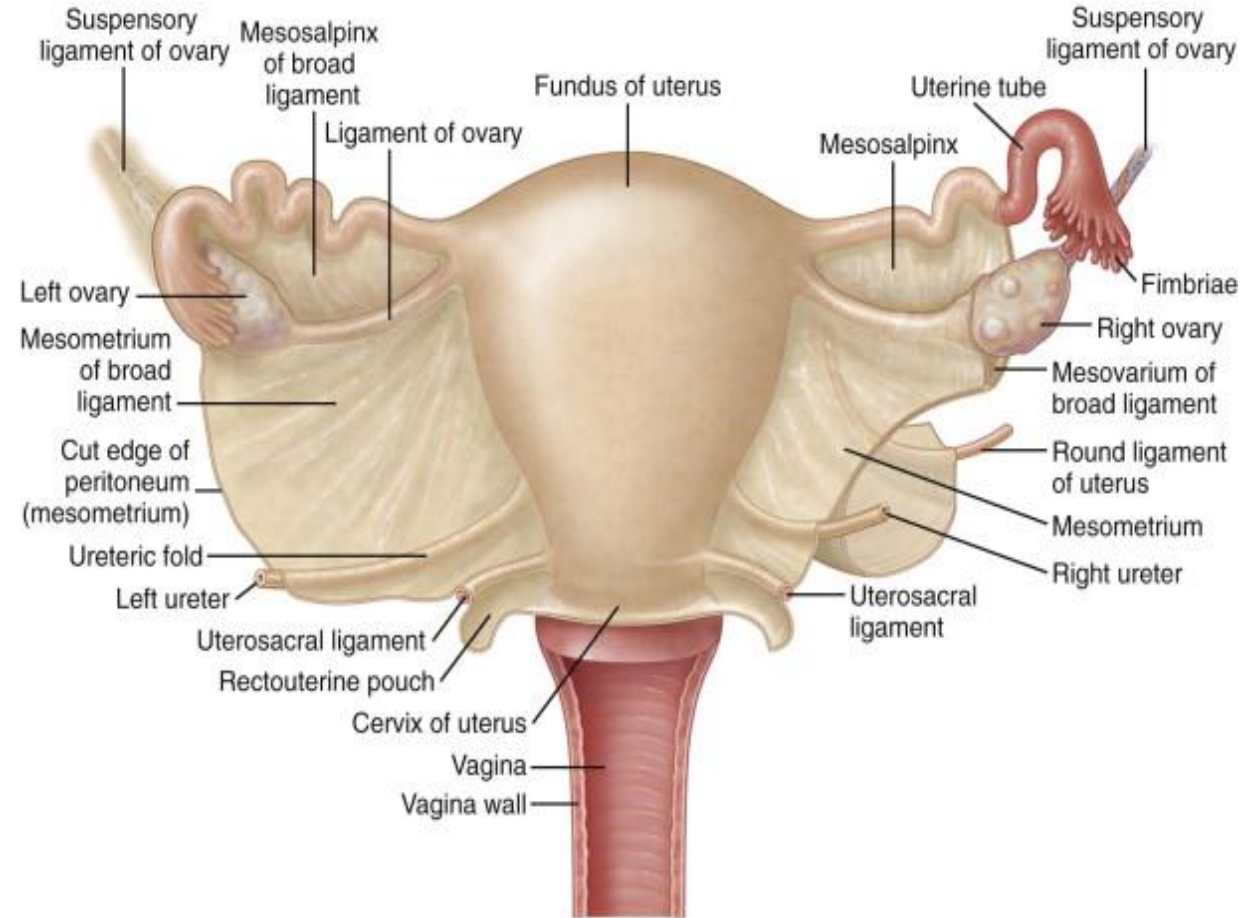
Length: It is about 10 cm long.

Site: It lie in the free anterior borders of the broad ligament.

Ends:

Each tube has two ends:

- **The medial end (uterine ostium):** It opens at the superior angle of the uterine cavity.
- **The lateral end (abdominal ostium):** It opens into the peritoneal cavity in the region of the ovary.



Uterus and broad ligament (posterior view)

Course & parts of uterine tube:

It passes laterally and superiorly.

It consists of four main parts from medial to lateral:

1-Intramural part (uterine part): (1cm long)

- It lies within the myometrium- the narrowest part.

↳ Muscle wall of the uterus

+ shortest

2-Isthmus: (3cm)

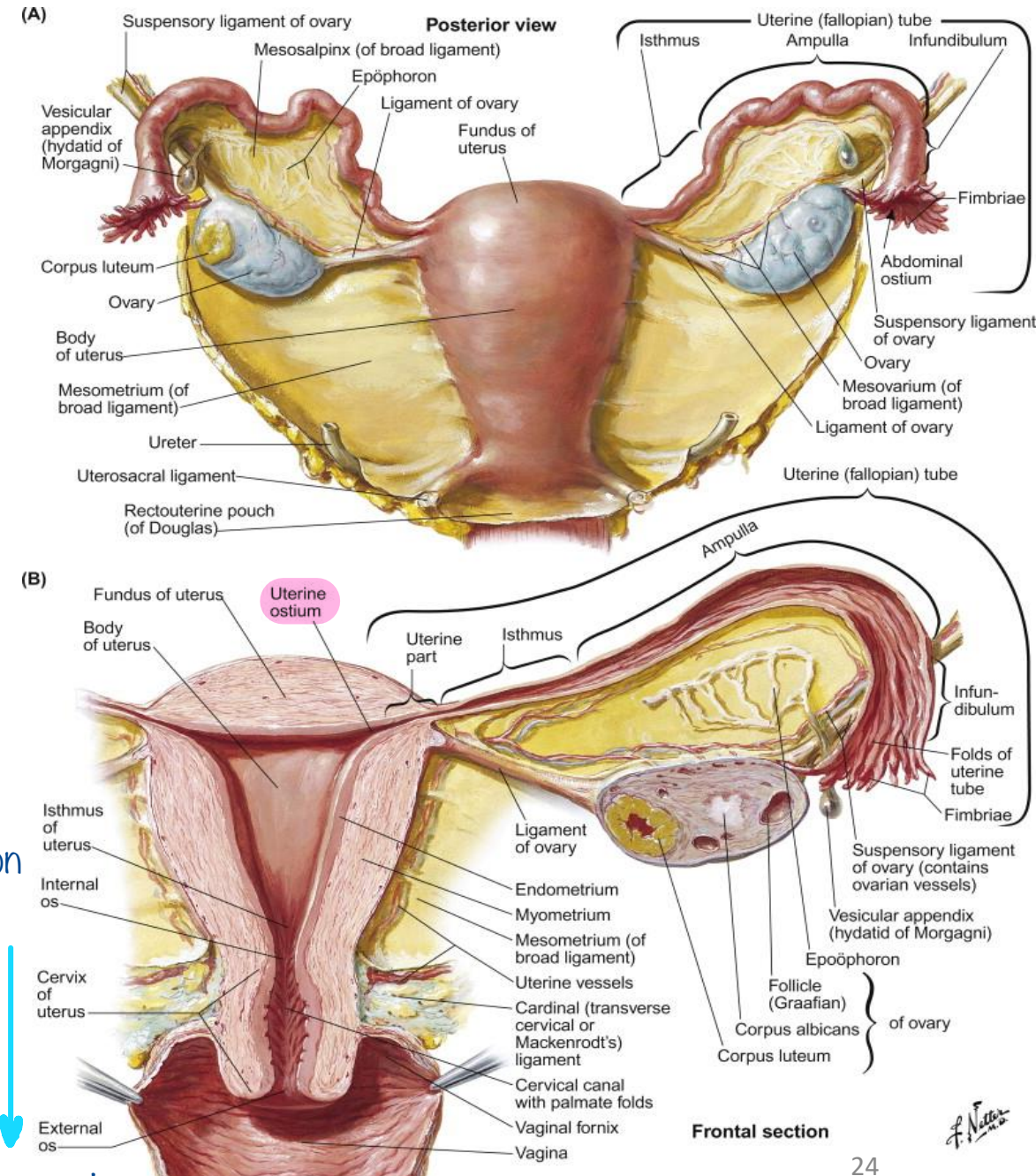
- It is narrow part & has thick wall. ❄️ Ectopic pregnancy »

pregnancy not in uterine cavity, one of the common sites for it is uterine tube

3-Ampulla: (5cm) ↳ + longest

- The widest portion & has thin wall.
- The fertilization takes place in its lumen.
- It opens into the infundibulum at the abdominal ostium.

❄️ That happens when tube is not intact » fibrosis, inflammation, abnormality in cilia



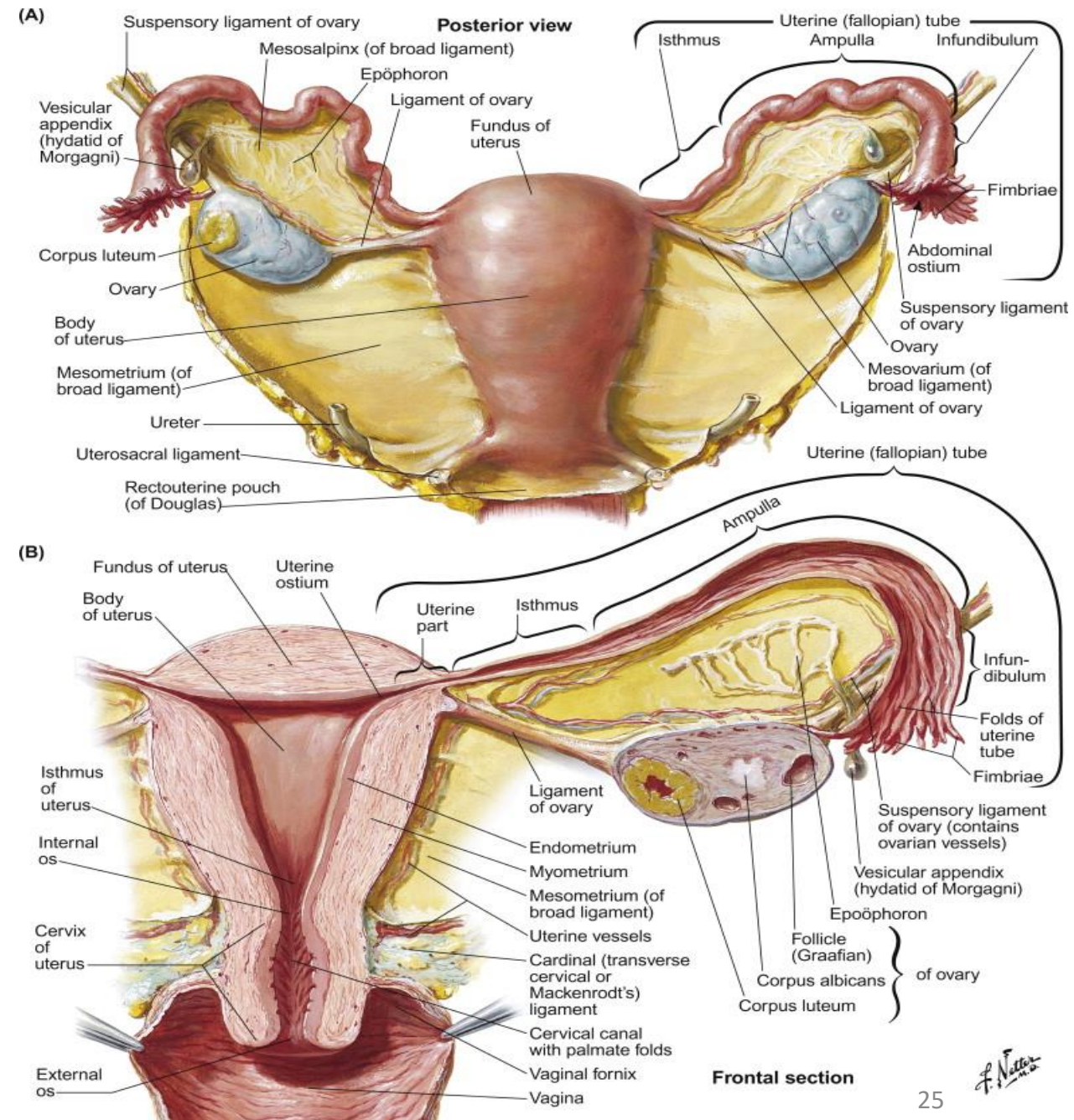
4-Infundibulum& fimbriae: (1 cm)

- Infundibulum is a **funnel-shaped part**.
- **Fimbriae, numerous mucosal finger-like folds, are attached to the ends of the infundibulum** (extend from its inner circumference beyond the muscular wall of the tube).

* Abdominal ostium is between ampulla and infundibulum

Peritoneal relations:

- The **part of the broad ligament between the tube and ovarian ligament** is called **mesosalpinx**.
- The **mesosalpinx contains the anastomosis between ovarian and uterine arteries**.



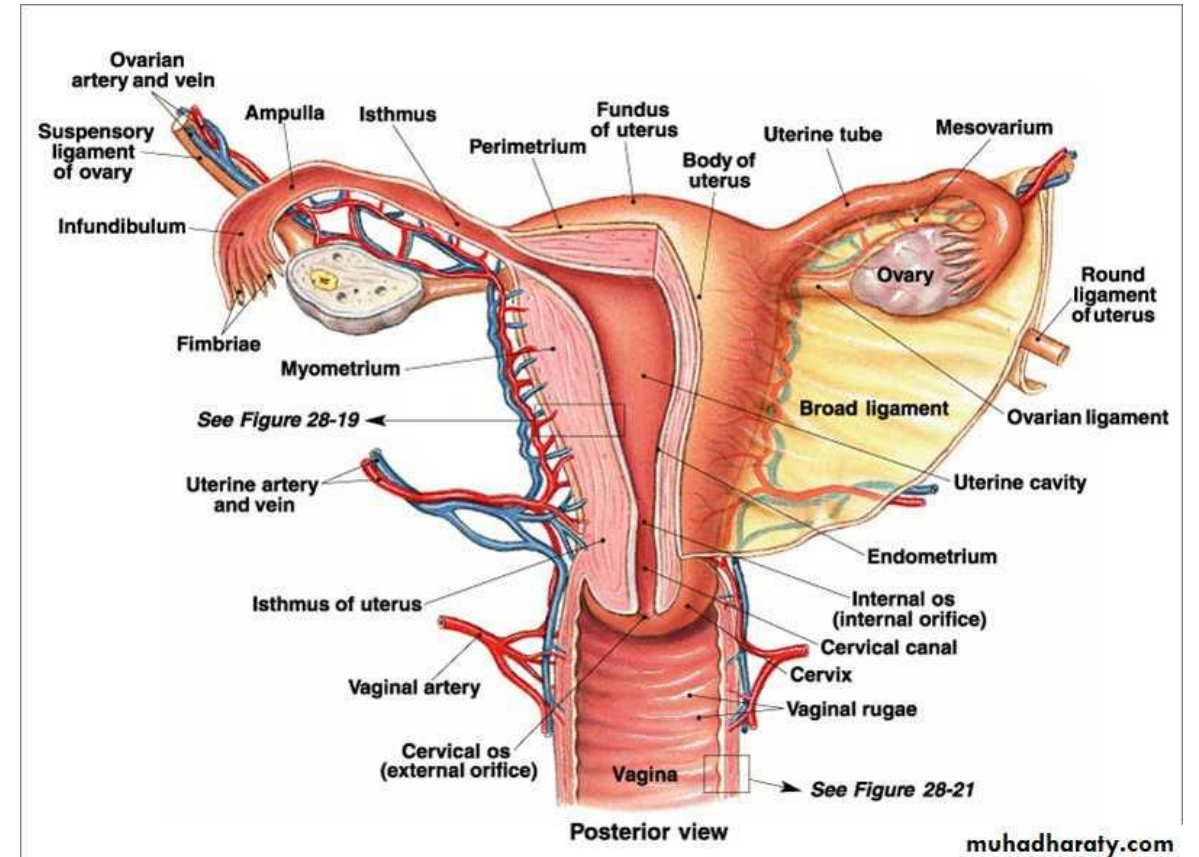
Arterial supply:

By branches from the uterine artery & ovarian artery.

Lymphatic drainage:

Para-aortic nodes and internal iliac nodes.

- The tube is common site for ectopic pregnancy which is usually rupture during 2nd trimester causing hemorrhage in the abdominal cavity.



**Thank
you**