

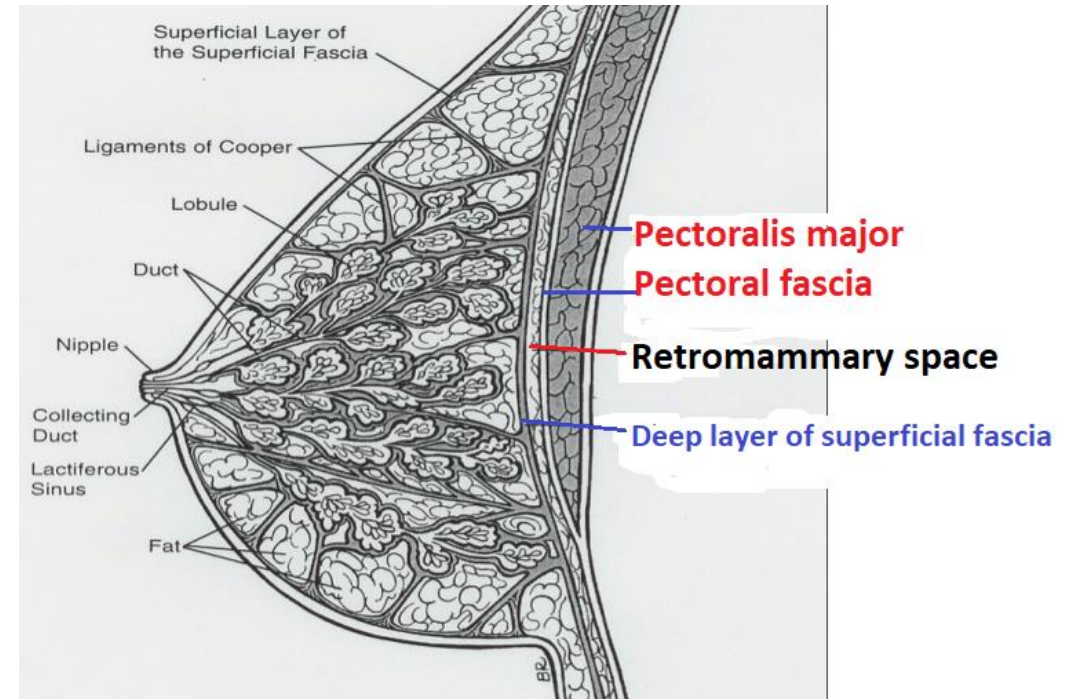
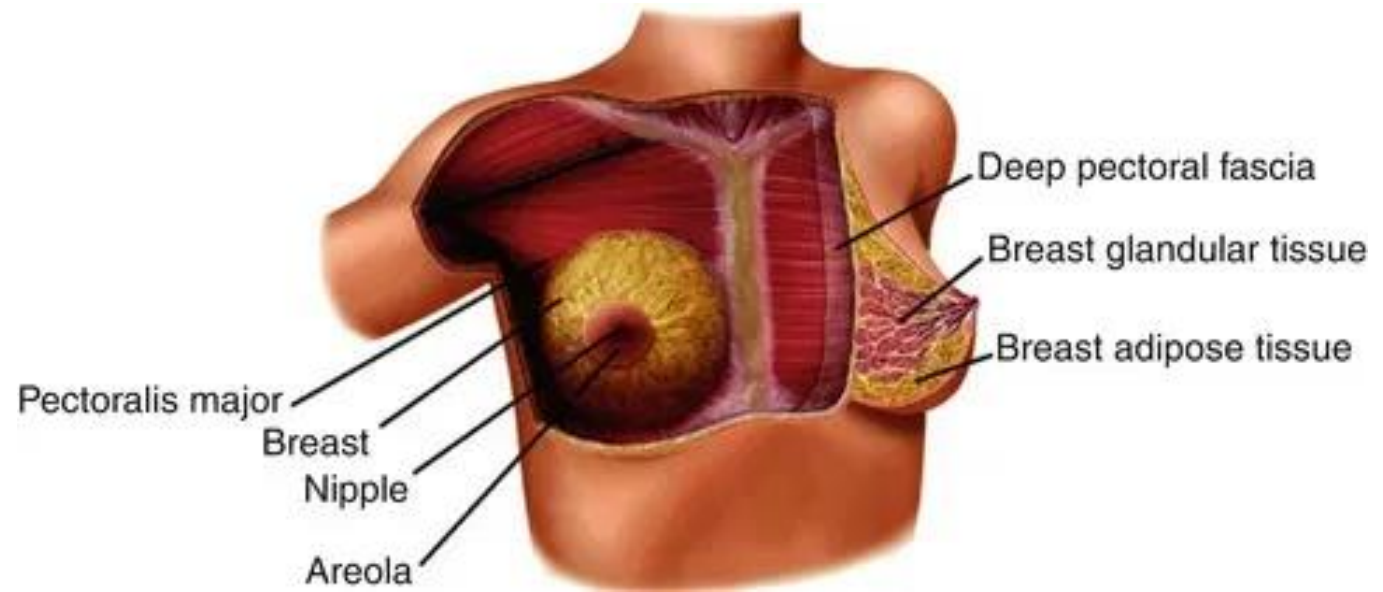
Dr. Zahid Kaimkhani

By the end of the session, the student should be able to:

- Describe the shape and position of the female breast.
- Describe the structure of the mammary gland.
- List the **blood supply** of the female breast.
- Describe the **lymphatic drainage** of the female breast.
- Describe the applied anatomy in the female breast.

The Mammary Gland

- are **modified sweat (Apocrine) glands** (exocrine glands).
- Present in both sexes.
- Become **functioning** only in lactating females.
- Lie on the front and the sides of the chest within the **superficial fascia**.
- Behind the breasts is a space filled with loose connective tissue called the **Retromammary space**, (allows the breast to move freely).



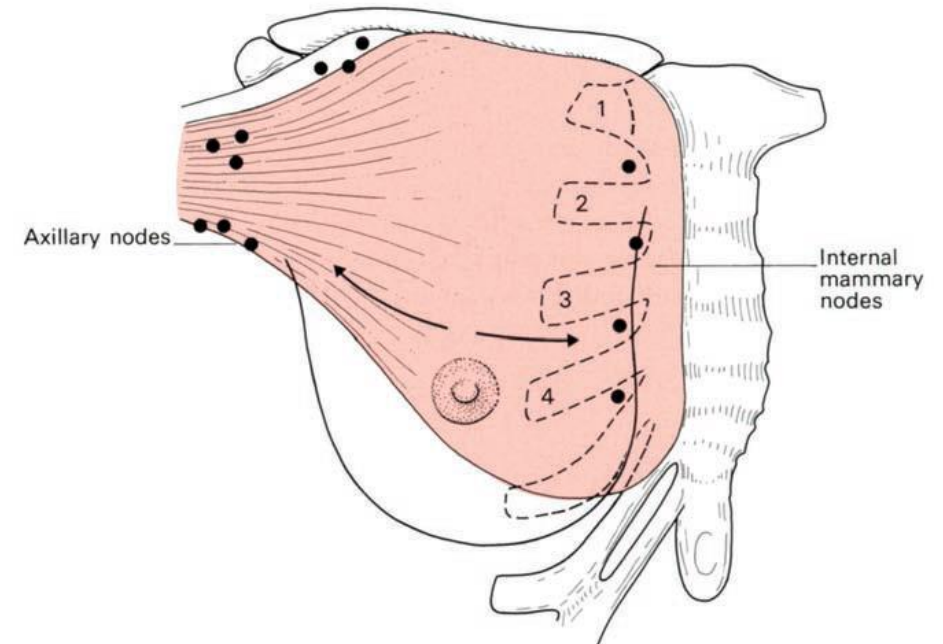
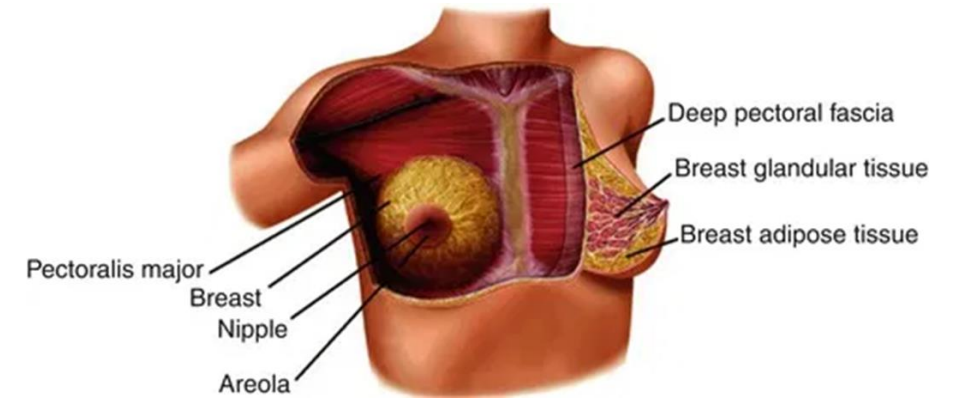
The Mammary Gland

Parts, Shape & position of the Gland

- ~~non capsulated~~, conical in shape, has a base, apex and tail

Base (fairly constant)

- Extends from 2nd rib to 6th ribs.
- Extends from the sternum to the midaxillary line.
- two-thirds of it rests on pectoralis major,
- one-third on serratus anterior,
- while its lower medial edge just overlaps the upper part of the rectus sheath.



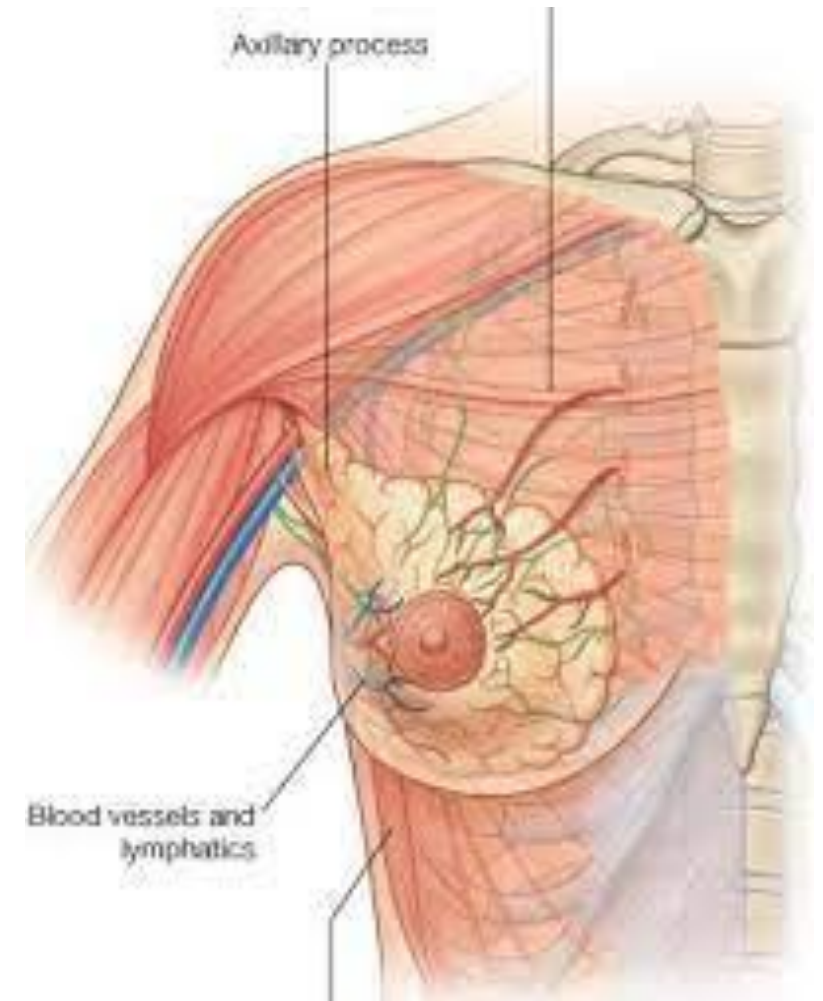
The Mammary Gland

Parts, Shape & position of the Gland

The axillary tail (of Spence)

- Is a small superolateral part of the breast
- Extends upward and laterally toward the axilla
- Lies in the subcutaneous fat
- May pierce the deep fascia of the axillary floor and lie adjacent to **axillary lymph nodes**.

This is important because a breast cancer can develop in this axillary tail, even though it might not seem to be located within the actual breast.



The Mammary Gland

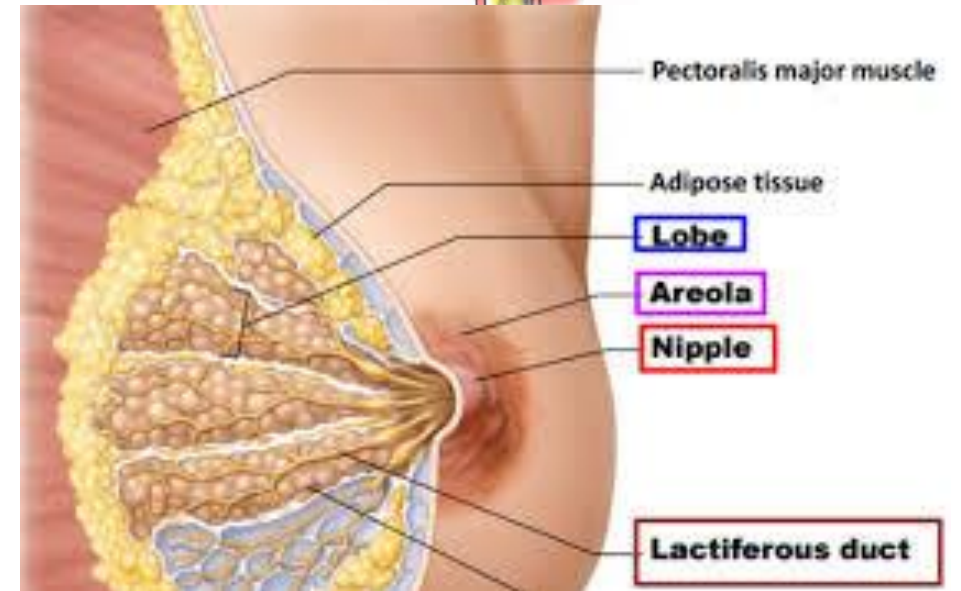
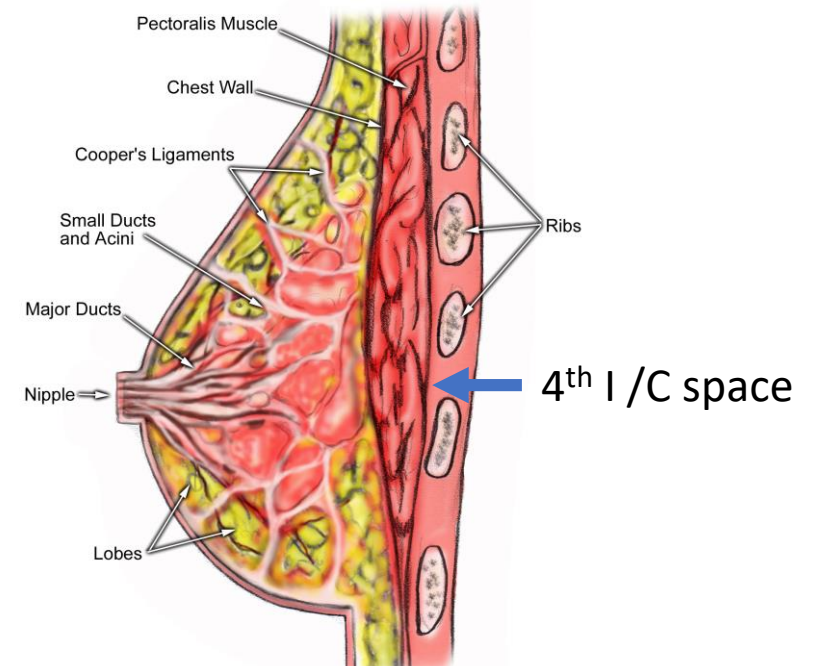
Parts, Shape & position of the Gland

Nipple

- a conical eminence that projects forwards from the anterior surface of the breast.
- lies opposite 4th intercostal space.
- carries 15-20 narrow pores of the lactiferous ducts.

Areola

- is a dark pink brownish circular area of skin that surrounds the nipple.
- The subcutaneous tissues of nipple & areola are devoid of fat.



The Mammary Gland

STRUCTURE

The breast

Is made up of 15–20 lobes of glandular tissue

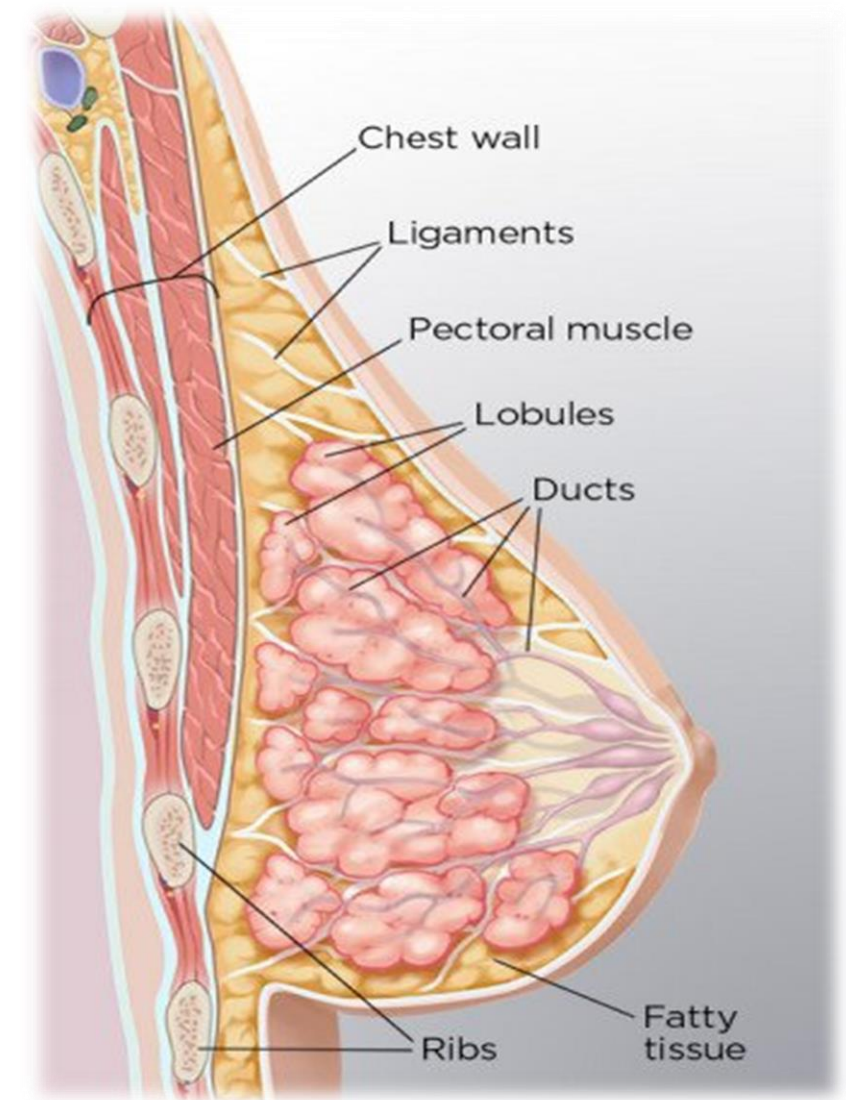
Is embedded in fat;

The fat accounts for its smooth contour and most of its bulk.

Lobes are separated by fibrous septa running from the subcutaneous tissues to the fascia of the chest wall (the *ligaments of Cooper* or (*suspensory ligaments*)).

These ligaments give the breast support by connecting the skin of the breast to the deep fascia of underlying pectoralis muscle.

Each lobe drains by its lactiferous duct on to the *nipple*, Areola lubricated by the *areolar glands of Montgomery* (large, modified sebaceous glands which may form sebaceous cysts which may, in turn, become infected).



The Mammary Gland

Structure of the Breast

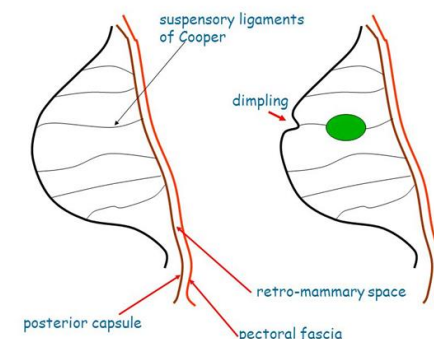
Ref. Last's Anatomy 11 edi

Posterior Capsule of the breast

The superficial fascia behind the breast (continuation of membranous layer of abdominal fascia scarpa) condensed to form the posterior capsule.

Fibrous strands (the suspensory ligaments of Cooper) connect the dermis of the overlying skin to the ducts of the breast and this capsule.

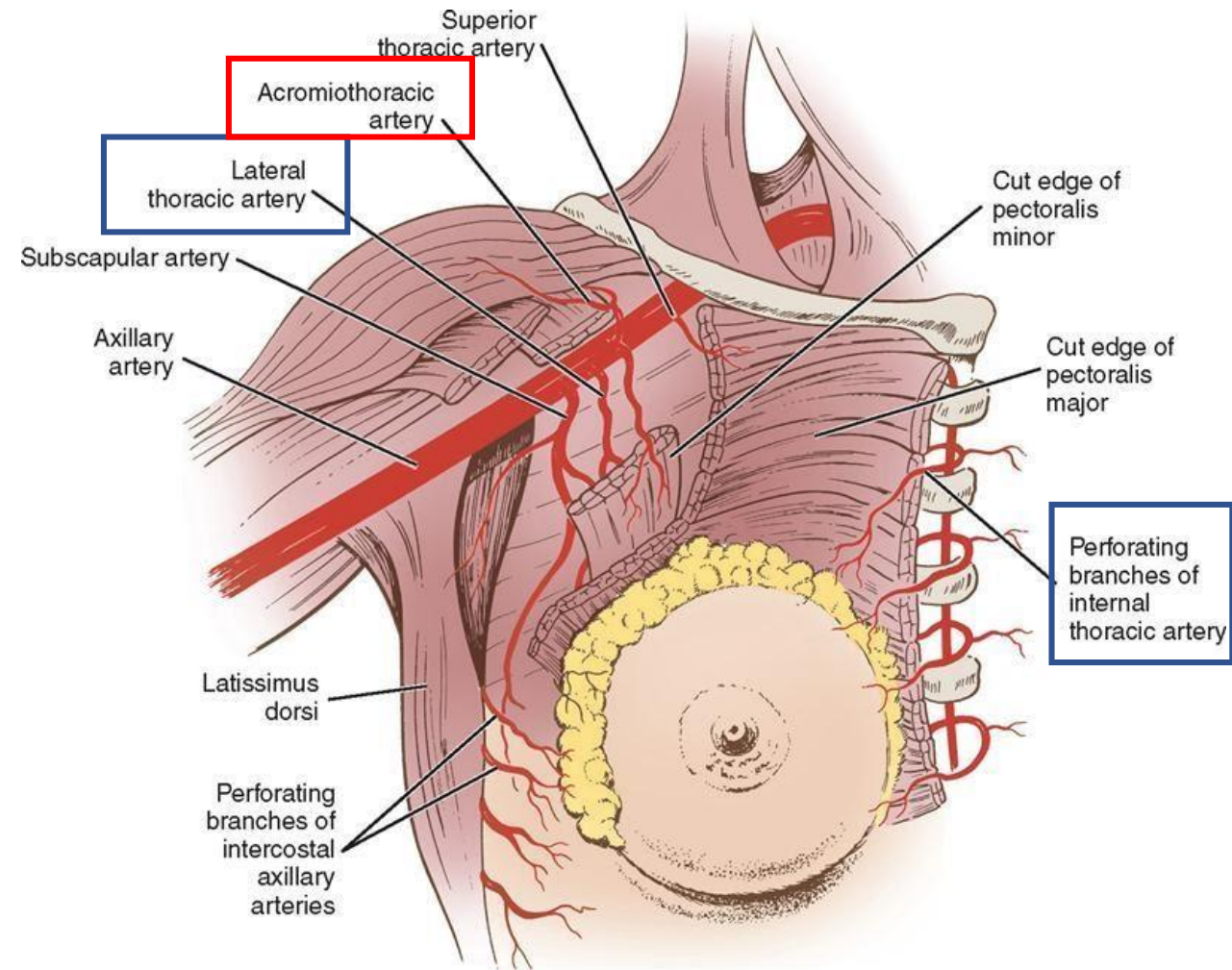
- Help to maintain the protuberance of the young breast.
- When atrophy with age –pendulous
- If contracted by fibrosis associated with carcinoma of the breast-dimpling of the overlying skin.
- Also cause pitting of the edematous skin (malignant involvement of the skin lymphatic (Peau d'orange)



The Mammary Gland

Blood Supply - Arteries

1. Mammary branches of **lateral thoracic artery (Main arterial supply)** Ref. Last's Anatomy 11 edi
2. The Perforating & mammary branches of **internal thoracic artery besides sternum (those of 2nd & 3rd space s are the largest).**
3. Small mammary branches of posterior intercostal arteries.
4. Pectoral branches of thoracoacromial artery supply the upper part of the breast.



The Mammary Gland

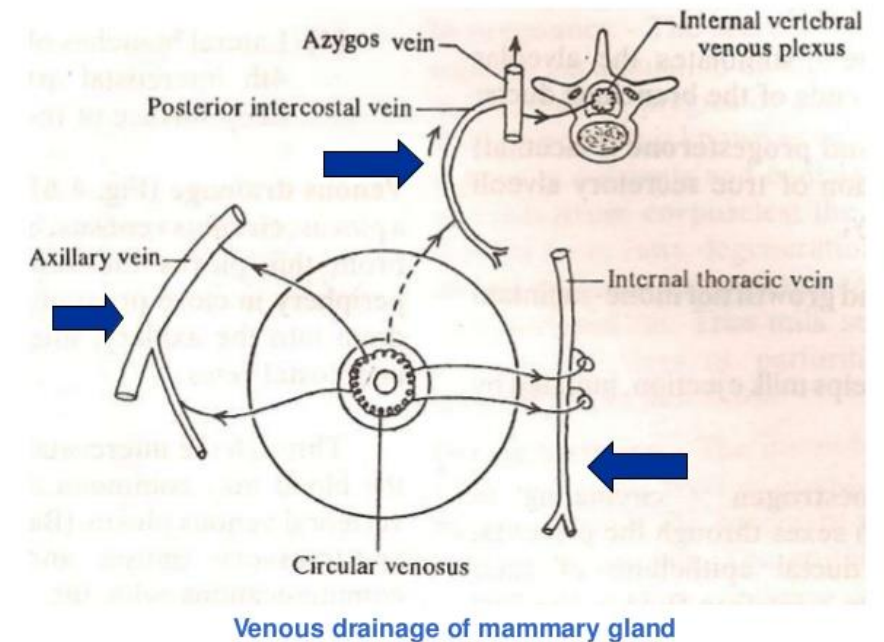
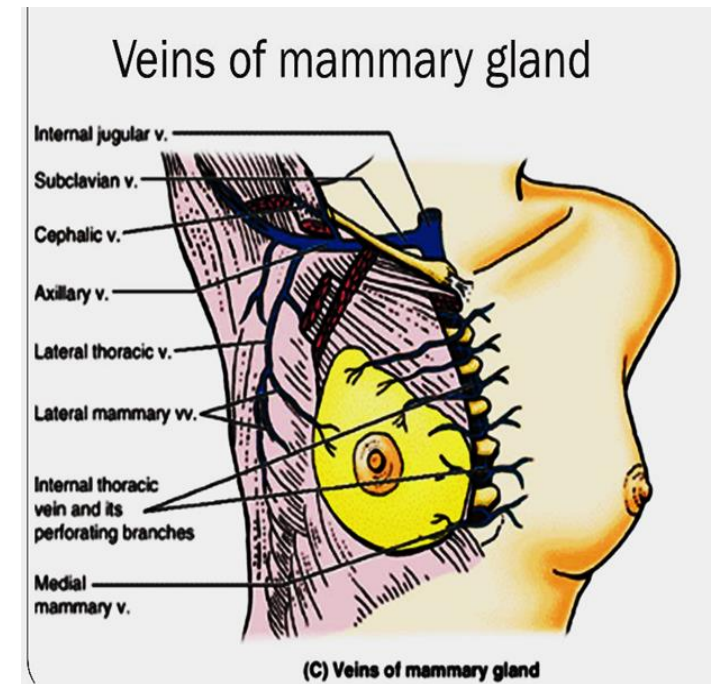
Blood Supply – Venous Drainage

Veins are corresponding to the arteries.

From Circular (circum-areolar) venous plexus found at the base of nipple &

From glandular tissues

- **Finally**, veins of this plexus **drain** into **axillary & internal thoracic veins**.
1. **Internal thoracic** into **brachiocephalic vein**
 2. **Axillary** → **subclavian vein**
 3. **Intercostal** → **azygous (Rt) or hemiazygous (Lt) venous system**.

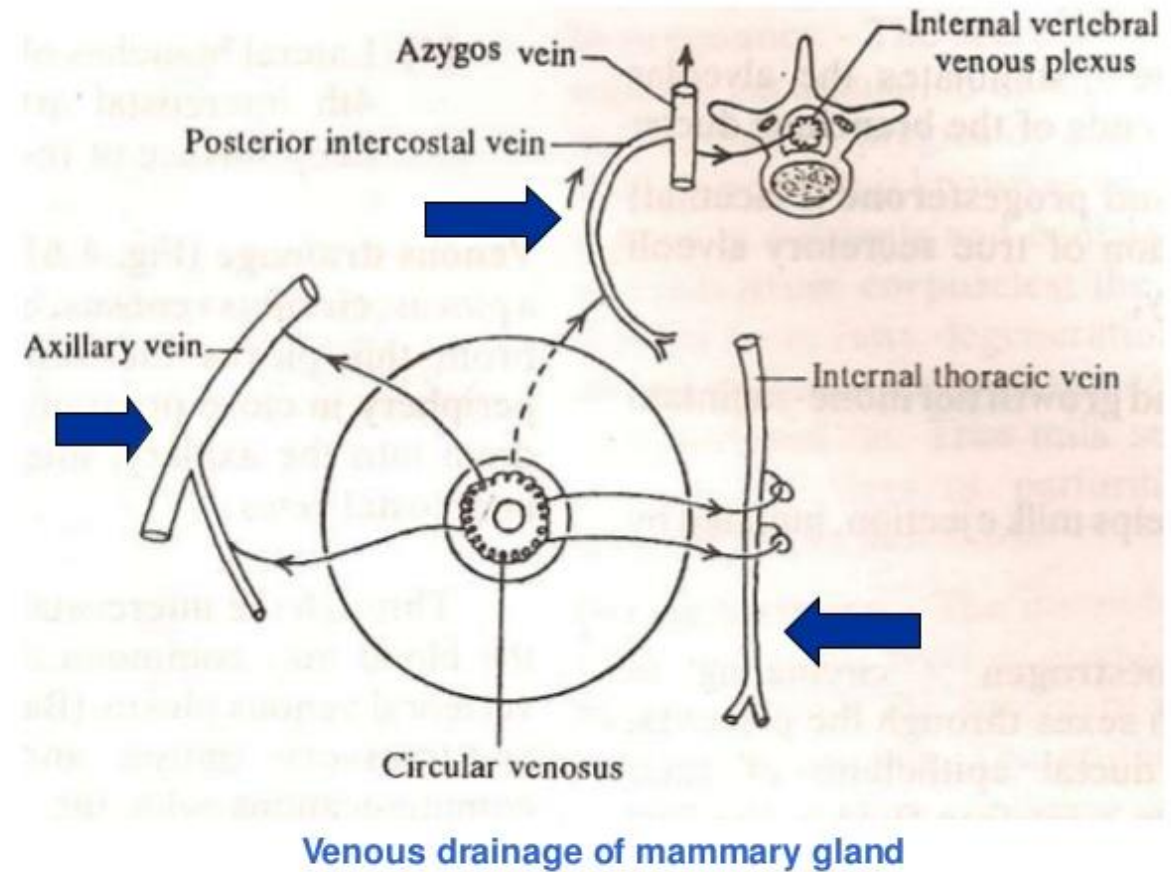


The Mammary Gland

Blood Supply – Venous Drainage

Note: *How breast cancer metastasizes to bone (vertebrae).*

*Some venous drainage to post int. costal veins that links to int. vertebral venous plexus.
Reflux blood flow thru these large valveless veins results in spread of malignancy*

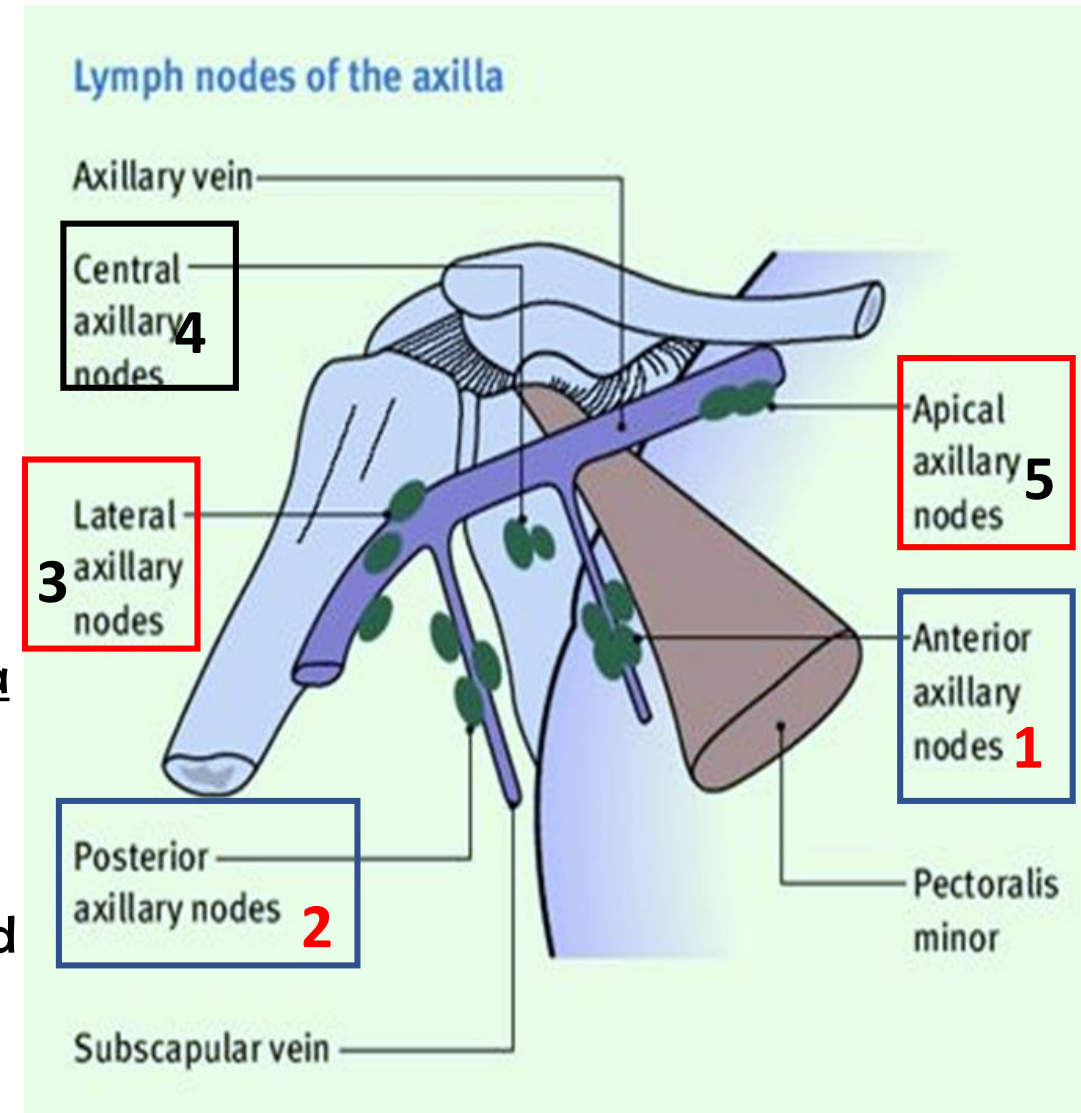


The Mammary Gland

Lymphatic Drainage

Axillary Lymph Nodes

- arranged into **5 groups** which lie in axillary fat :
- Pectoral (Anterior) group** : which lies on the pectoralis minor along **lateral thoracic vessels**.
 - Subscapular (Posterior) group** : which lies on posterior wall of axilla on lower border of subscapularis; along **subscapular vessels**.
 - Brachial (Lateral) group** : lies on lateral wall of axilla along **3rd part of axillary vessels**.
 - Central group** : lies in axillary fat at the base of axilla.
 - Apical group** : lies at apex of axilla immediately behind the clavicle.



The Mammary Gland

Lymphatic Drainage

Lymph vessels:

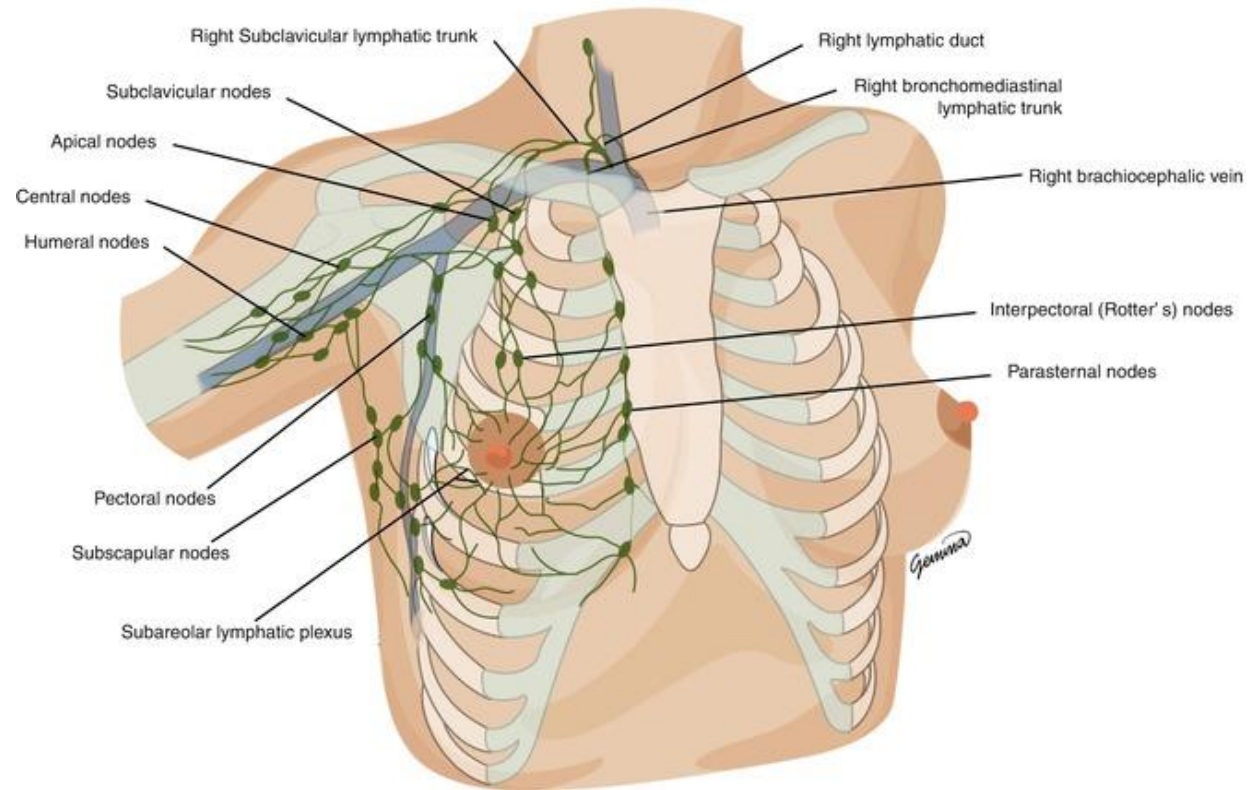
- I. Superficial lymphatic plexus(Subareolar plexus):

Lies beneath the areola.

- I. Deep lymphatic plexus (Submammary plexus):

Lies on the deep fascia covering pectoralis major.

- Both plexuses radiate in many directions and drain into:
 - a. Axillary groups &
 - b. Internal thoracic L.Ns.

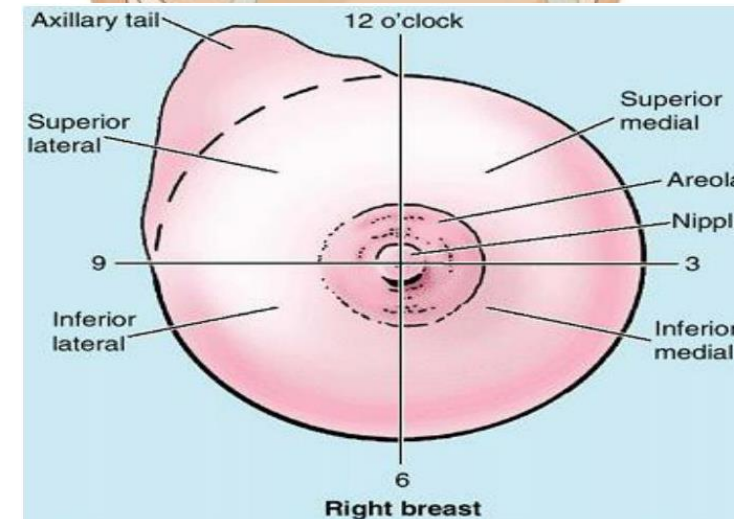
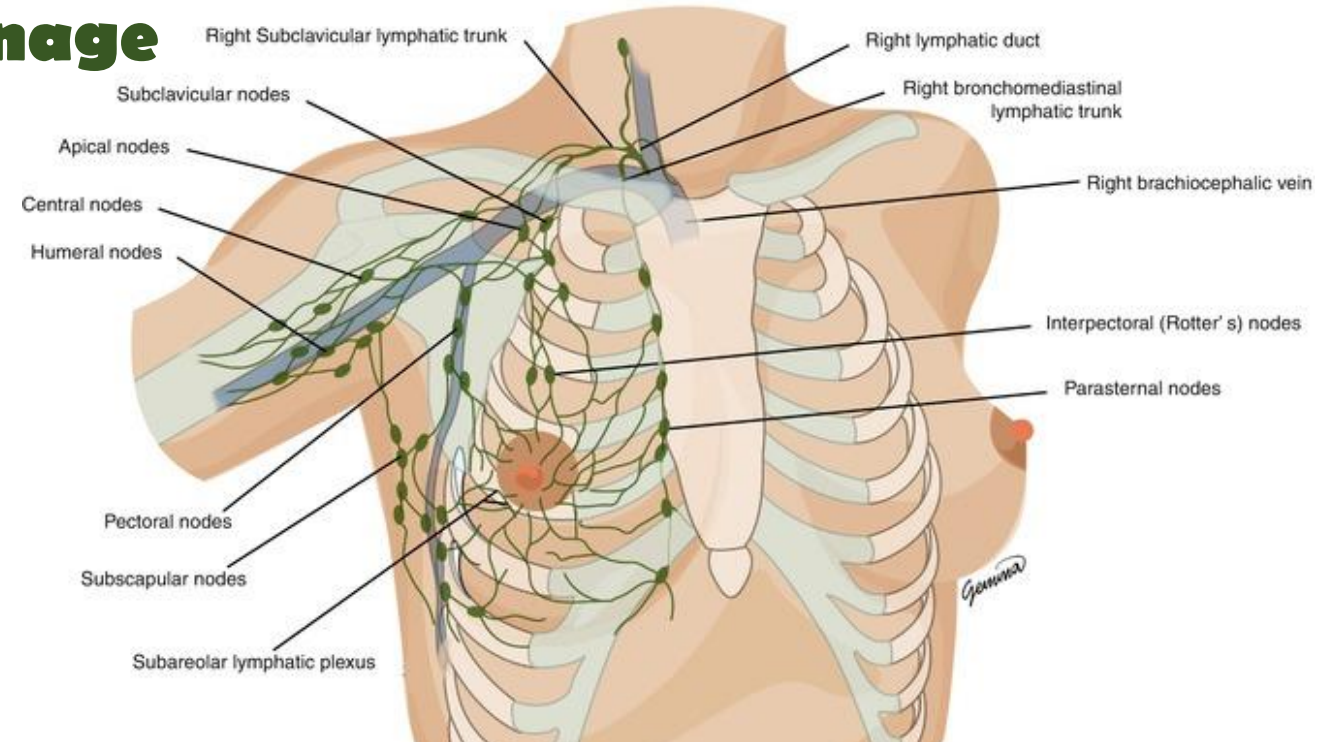


The Mammary Gland

Lymphatic Drainage

Lymph nodes:

- **Central & lateral parts:** (75%) drain into pectoral group of axillary LN.
- **Upper part:** drains into apical group of axillary LN.
- **Medial part** drains into **internal thoracic (parasternal) LN**, forming a chain along the **internal thoracic vessels**.
- Some lymphatics from the medial part anastomose with lymphatics of opposite breast.
- **Inferomedial part:** anastomose with lymphatics of **rectus sheath, linea alba** and **sub diaphragmatic LN.**

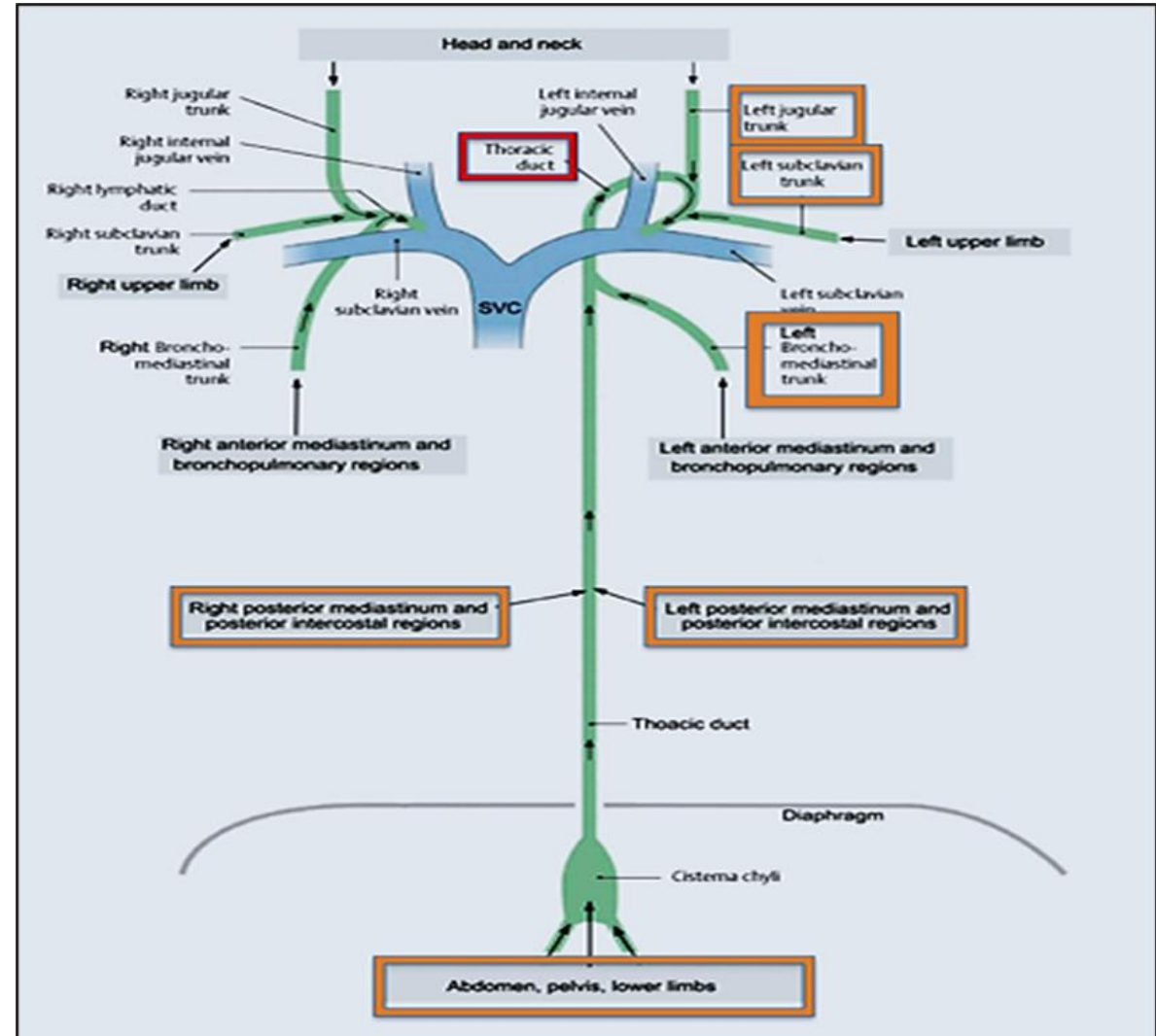


The Mammary Gland

Lymphatic Drainage

Efferent of Axillary LN

- Continue with cervical LN.
- On right side → Drain into **right lymphatic duct**
- On left side → **thoracic duct**
- Both will terminate at the junction between the **internal jugular** and the **subclavian vein**, thus, the lymphatic drainage returns back to the circulation.

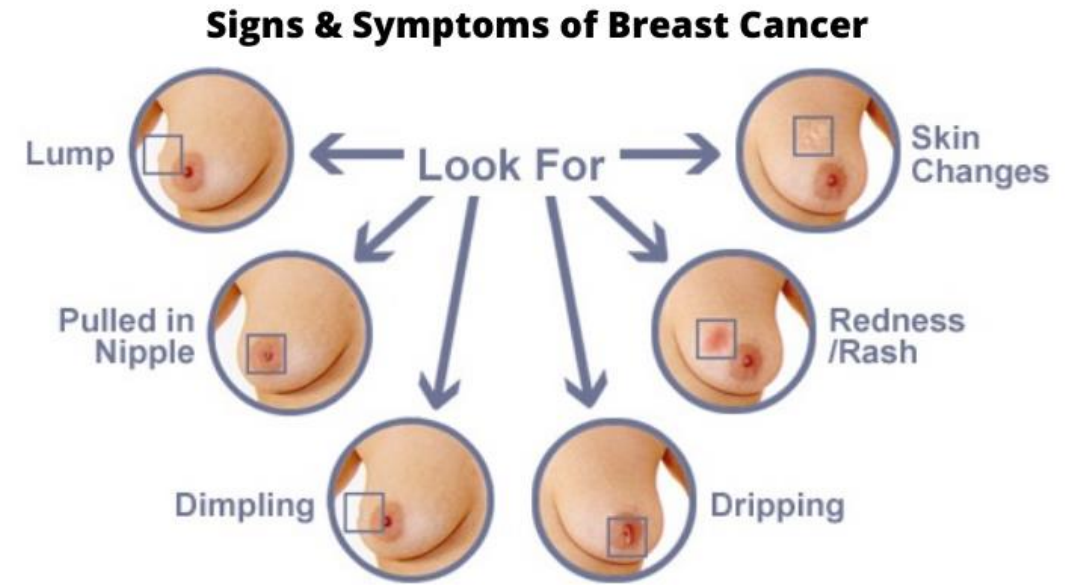


The Mammary Gland

Applied anatomy

Breast cancer

- It is a common surgical condition.
- 60% Ca breast occur in the **upper lateral quadrant**.
- **75% of lymph** from the breast **drains** into the **axillary lymph nodes**.
- carcinoma of one side can spread to **other breast** and the **opposite axillary lymph nodes are affected** because of the anastomosing lymphatics.
- In patients with **localized cancer breast**, a simple mastectomy, followed by radiotherapy to the axillary lymph nodes is the **treatment of choice**.



- New **lump in the breast** or underarm (armpit).
- Thickening or **swelling** of part of the breast.
- Irritation or **dimpling** of breast skin.
- Redness or flaky skin in the nipple area or the breast.
- Pulling in of the nipple or pain in the nipple area.
- **Nipple discharge** other than breast milk, including blood

The Mammary Gland

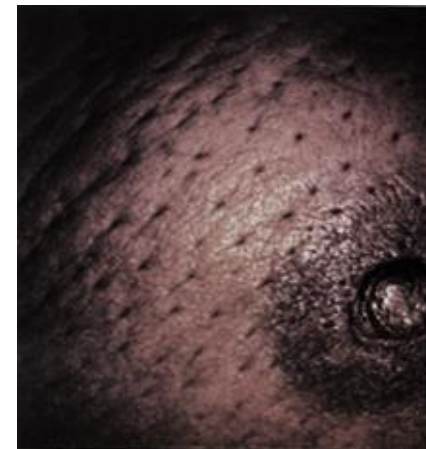
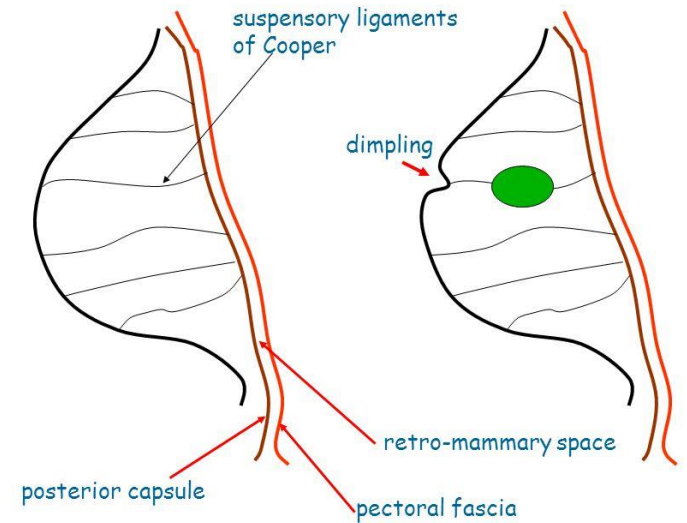
Applied anatomy

Breast cancer

The lactiferous ducts are radially arranged from the nipple, so incision of the gland should be made in a radial direction to avoid cutting through the ducts.

Infiltration of the ligaments of Cooper leads to its shortening giving dimpling

lymph edema
peau de'orange appearance of the breast.





The Mammary Gland

Applied anatomy

Breast cancer

accounted for 15.9% of all **cancers** reported among **Saudi** nationals
28.7% of all **cancers** reported among females of all ages.

The age-standardized rate (ASR) was 22.7/100,000 for the female population while, at diagnosis, the median age was 50 years [5].Jum. I 20, 1441 AH

Highest rate

Belgium, Denmark, The Netherlands,

WHY

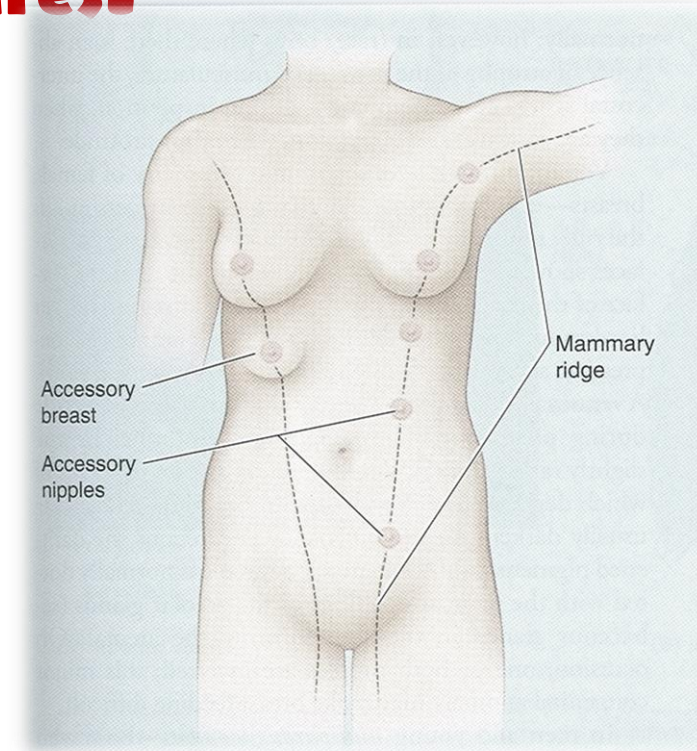
A richer diet, smaller families, delayed childbearing and reduced breast-feeding have driven the increase in the West, together with rising obesity and increased alcohol consumption, specialists say.

Now these trends are being seen everywhere – with a growing burden of malignant disease in their wake.

Development of Breast

Mammary ridge (Milk Line)

- In 7th week embryo
- Bilateral Thickened epidermis
- EXTENDS FROM THE (base of the fore limb) AXILLA TO (base of the hind limb) THE INGUINAL REGION.
- **IN HUMAN**, major part of THE RIDGE DISAPPEARS soon after it forms **EXCEPT** FOR A SMALL PART IN THE **PECTORAL (thoracic) REGION**.
- **IN ANIMALS**, SEVERAL MAMMARY GLANDS ARE FORMED ALONG THIS RIDGE.
- POLYTHELIA accessory nipple (usually in axilla)
- POLYMASTIA complete breast
- INVERTED NIPPLE



Thank
You

