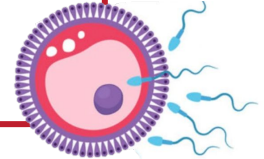


Female breast

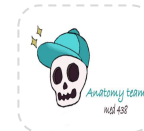
Reproductive block - Anatomy - Lecture 5

[Editing file](#)
[Summary file](#)



Color index:

- Girls' slides
- Boys' slides
- Main content
- Extra
- important
- Dr's notes



Objectives

At the end of the lecture, students should be able to:

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

★ Don't forget to check Dr Sameerah's questions on the quiz slide ★

Breast



A highly recommended video covers most of the lecture

Shape

- It is conical in shape and **non-capsulated** (some are spherical in shape)

Location

- It lies in superficial fascia of the front of chest.

It has

Apex (Nipple)

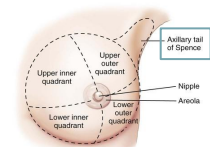
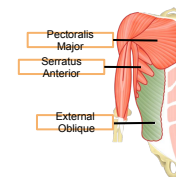
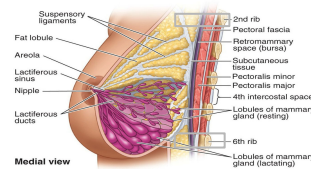
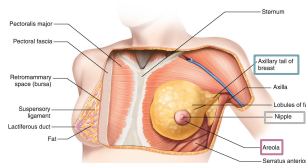
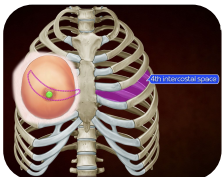
- Its shape and projection varies from cylindrical, rounded at the top & flatten depending on hormonal, nervous and developmental factors
- Conical eminence that projects forwards from the anterior surface of the breast
- It lies opposite 4th intercostal space in the midclavicular line
- The level of the nipple varies widely in women because of different breast size we can't locate the nipple accurately like men
- It carries 15-20 narrow pores of the lactiferous ducts
- It is surrounded by ★ Areola which is dark pink brownish circular area of skin
- The subcutaneous tissues of nipple & areola are devoid of fat (It has erectile tissue)
- The advantage of this, if the person become obese and starting to accumulate fat, there won't be any fat accumulated beneath it that may disrupt its job.

Base (3 muscles)

- Upper 2/3 of its base lies on fascia over ★ Pectoralis major muscle
- While its inferolateral 1/3 lies on fascia over ★ Serratus anterior & ★ External oblique muscles
- while its lower medial edge just overlaps with the upper part of the rectus sheath
- Vertically:** It extends from 2nd rib superiorly to 6th ribs inferiorly
- Horizontally:** It extends from lateral margin of the sternum medially to midaxillary line laterally

Tail (axillary tail/process)

- In 95% 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
- Pierces the fascia at the lower border of pectoralis major muscle and sends a process into the axilla called the ★ axillary tail or ★ axillary process (axillary tail of spence)
- 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



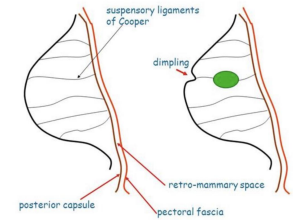
Structure of the breast

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.

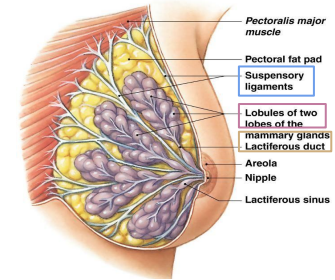
Fibrous strands (the suspensory ligaments of Cooper) connect the dermis of the overlying skin to the ducts of the breast and this capsule.

- Help to maintain the protuberance of the young breast.
- When atrophy with age –pendulous **Sagging / dropping**
- 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)
orange appearance of the breast



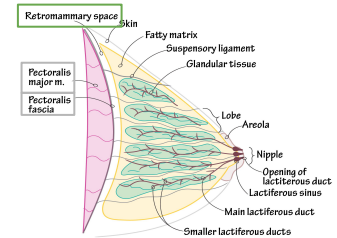
Mammary glands

- They are Non capsulated, modified sweat (Apocrine) glands (exocrine glands)
- Present in both sexes but it well developed in females. And Become functioning only in lactating females
- Location : Lie on the front and the sides of the chest within the superficial fascia



★ Retromammary space (Submammary space)

- **Definition**
Space that found behind the breasts and filled with loose connective tissue
- **Importance:** allows the breast to move freely. + often the site of breast implantation



Structures of mammary gland

1

It is formed of 15-20 lobes of glandular tissue which consists of glandular tissue and group of secreting ducts, each lobe is formed of a number of ★ lobules which are embedded in the subcutaneous fatty tissue of superficial fascia

2

★ Ligaments of Cooper (suspensory ligament)

- The lobes and lobules are separated by **interlobar** and **interlobular** fibrous & fatty tissue called suspensory ligaments or ligaments of Cooper
- **Suspensory ligaments extends from the pectoralis major to the nipple**
- **Run radially** and connect the skin of breast with deep fascia of underlying pectoralis major muscle
- **importance: Its well developed in the upper part of the breast as it helps to give the breasts SUPPORT to maintain and hold the shape of the breast**
- **With age these suspensory ligaments become weak which causes sagging and dropping of breast in old woman**
- it has clinical importance also :When breast cancer occurs , it invade these ligaments leading to **dimpling appearance** of breast.

3

- It has from 15-20 ★ lactiferous ducts which open by the same number of openings on the summit of the nipple
- **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).**

Supply of breast



Subclavian artery :

1. Internal thoracic artery → Perforating branches and medial mammary
2. Axillary artery → lateral thoracic artery, Supreme thoracic & Thoracoacromial



Breast cancer can metastasize to

1. Lung → through internal thoracic & axillary veins
2. Skeleton & CNS → through the intercostal vein

Arterial supply

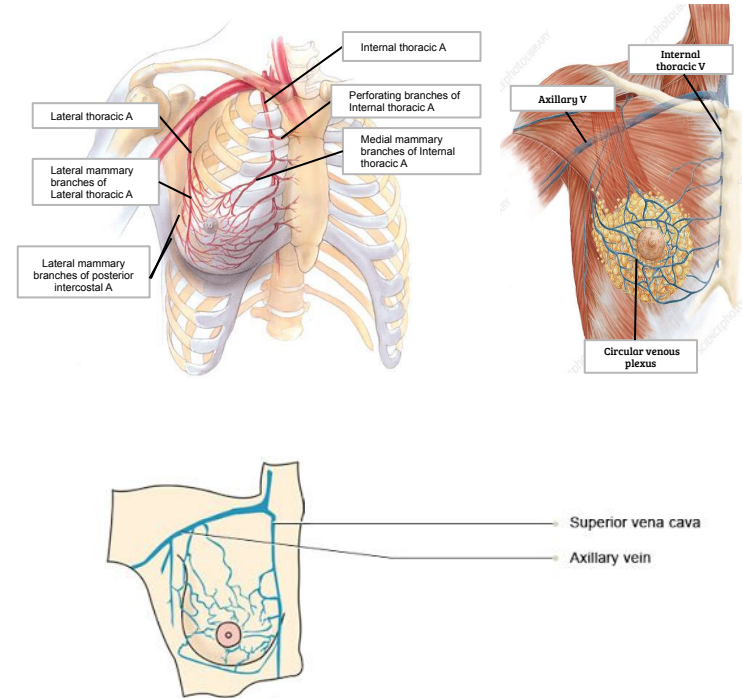
1. Perforating branches & mammary branches of internal thoracic (internal mammary) artery those of the 2nd & 3rd spaces are the largest
2. Mammary branches of lateral thoracic artery main arterial supply
3. Small mammary branches of the 3rd, 4th & 5th posterior intercostal arteries arising from thoracic aorta
4. Pectoral branches of thoracoacromial artery supply the upper part of the breast

Venous drainage

- Veins are corresponding to the arteries:
 1. Internal thoracic → brachiocephalic vein
 2. Axillary → subclavian vein (lateral thoracic artery empties in the axillary)
 3. Intercostal → azygous (Rt) or hemiazygous (Lt) venous system (posterior intercostal artery empties in the intercostal)
- Circular (circum areolar) venous plexus (superficial) are found at the base of nipple → Finally, veins of this plexus drain into axillary & internal thoracic veins

Note: How breast cancer metastasizes to bone (vertebrae) boys slides

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



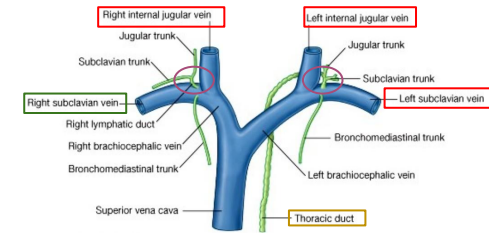
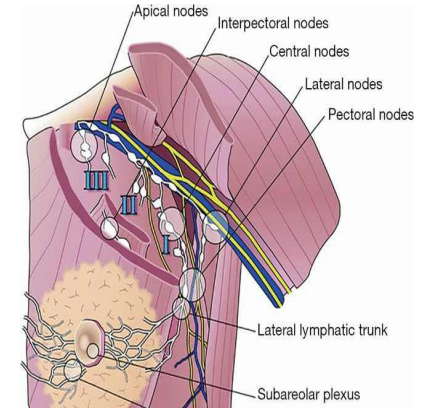
Axillary lymph nodes

- 💡 Axillary lymph nodes drains:
- Upper limb
 - upper abdominal wall
 - Most of the breast
 - Pectoral region

They are arranged into 5 groups which lie in axillary fat

Pectoral (Anterior) group	Lies on the pectoralis minor along lateral thoracic vessels Drain pectoral region , breast and upper abdominal wall
Subscapular (Posterior) group	Lies on posterior wall of axilla on lower border of subscapularis; along subscapular vessels. Drain back till the hip joint
Brachial (Lateral) group	Lies on lateral wall of axilla along 3rd part of axillary vessels. Drain upper limb
Central group	Lies in axillary fat at the base of axilla between the 3 previous groups Largest & most palpable one
Apical group	Lies at apex of axilla immediately behind the clavicle. Subclavian lymph trunk: it is formed by union of efferent lymph vessels of apical group, It usually opens in subclavian vein. Receives drainage of the 4 groups (Posterior, anterior, lateral & central) and the skin of the upper limb along the cephalic vein

- Efferent drainage continues with cervical lymph nodes.
- **On the right side:** It usually opens in ★ right lymphatic duct (subclavian vein)
- **On the left side:** it usually opens into ★ 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.



Lymphatic drainage of the breast

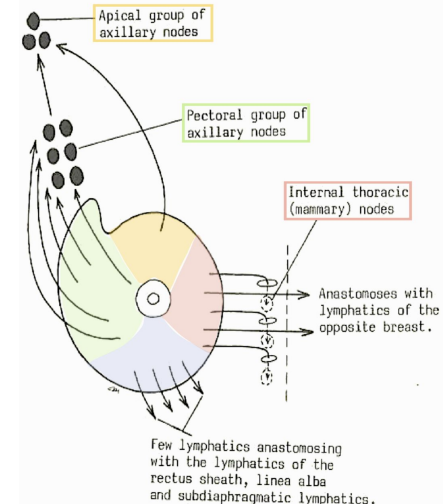
1) Lymph vessels

Superficial lymphatic plexus	Both	Deep lymphatic plexus
<ul style="list-style-type: none"> Also called Subareolar lymphatic plexus. Lies beneath the areola. 	<ul style="list-style-type: none"> Both plexuses radiate in many directions and drain into different lymph nodes (Axillary groups and Internal thoracic lymph nodes). Both communicate together with other lymph vessels to transmit lymph into lymph nodes (Axillary & Internal thoracic) 	<ul style="list-style-type: none"> Also called submammary plexus Present in the retromammary space Lies on the deep fascia covering pectoralis major.

2) Lymph nodes

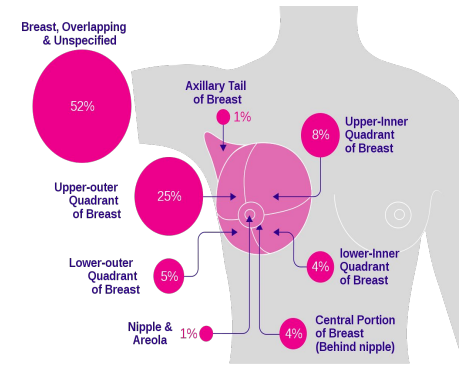
Central & lateral parts	Upper part	Medial part	Inferomedial part
<p>(75%) Drain into pectoral group of axillary lymph nodes.</p> <p>Most of the breast is draining into the axillary LN, so if there is a tumor in the breast, most of the time the LN of axilla will be involved.</p>	<p>Drains into apical group of axillary lymph nodes.</p>	<p>Drains into internal thoracic (parasternal) lymph nodes, forming a chain along the internal thoracic vessels.</p>	<p>Anastomose with lymphatics of rectus sheath, linea alba and subdiaphragmatic lymphatics.</p>

Some lymphatics from the medial part of the gland pass across the front of sternum to anastomose with that of **opposite side, Dangerous** because even if the breast cancer was removed it still can appear in the opposite side



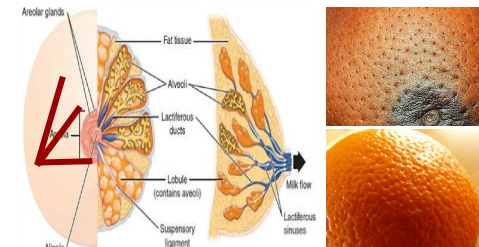
Breast cancer

- Most common malignancy among Saudi female with prevalence of 21.8% and a recent publication reports that breast cancer is the 2nd most common malignancy among Saudi women that's why it's the most common surgical condition
- It is a common surgical condition.
- 60% of carcinomas of breast occur in the upper lateral quadrant.
- 75% of lymph from the breast drains into the **axillary lymph nodes**.
- In case of **carcinoma of one breast**, the **other breast** and the opposite axillary lymph nodes are **affected** because of the anastomosing lymphatics **between both breasts**.
- In patients with localized cancer breast, a simple mastectomy, followed by radiotherapy to the axillary lymph nodes is the **treatment of choice**.
- 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.



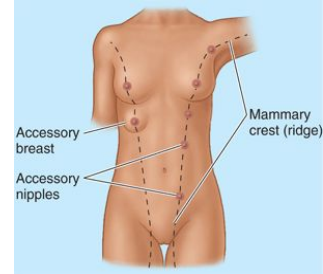
Applied anatomy

- 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 **peau de'orange (skin dimpling)** appearance of the breast.
- Sometimes some of the lymph nodes are the first site of the spread & surgical incision of the suspected lymph nodes may include total or partial removal of the lymph nodes and may lead to arm edema



Mammary ridge (Milk line)

- The mammary glands (breast) are derived from 2 thickened strips (mammary ridge) of epidermal ectoderm, the primitive mammary ridges or milk lines,
- Which appear during week 6, The ridges extend from the axillae to the inguinal regions, but rapidly regress except in the thorax
- **In 7th weeks embryo**
- **Bilateral thickened epidermis**
- **During the 2nd month of gestation 2 bands of thickened ectoderm appear on the ventral body wall extending from the axilla to the groin these lines are called milk lines and along these lines many gland tissue can develop**
- **If there is an excess nipples of the breast along these lines called supernumerary nipples or accessory breast**



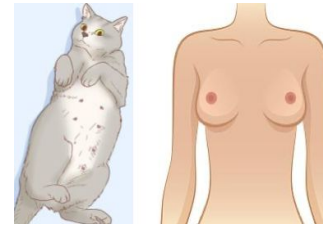
In Human

The ridge disappears EXCEPT for a small part in the pectoral (thoracic) region

Extends from the axilla to the inguinal region

In Animal

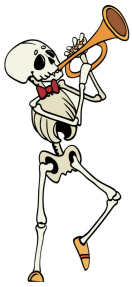
Several mammary glands are formed along this ridge



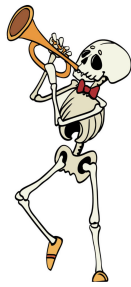
Animal vs Human

Polythelia	Accessory nipple (usually in axilla)
Polymastia	Complete breasts
Inverted nipple	





Congratulations you are done from basic Anatomy!! 🎉



Be proud of yourself you have studied 76 anatomy lectures in the past two years.

We will start with a **huge thanks to 438 for all the support and help they provided us with and for 438's and 439's amazing batch leaders, academic leaders and secret reviewer, we wouldn't have done this without you .**

For Anatomy's leaders ♡

**Mayasem Alhazmi, Fahad Alajmi, Abeer Awwad, Abdullah Alsubaihi & Rayan Jabaan
Thank you for putting such a tremendous time & effort into this team, our batch is fortunate to have you.**

For our members, note takers, organizers & revisers ♡

Thank you for your perfect work! Your hard work is greatly appreciated.





We think it's time to show you Anatomy's heroes



- Abdulaziz Alghuligah
- Abdulaziz Alkraidah
- Abdulaziz Alomairy
- Abdulaziz Alrabiah
- Abdulaziz Alsuhaim
- Abdullah Alburikan
- Abdullah Aldosari
- Abdullah almazroua
- Abdullah Alzoghaibi
- Abdulrahman Almugren
- Abeer Awwad
- Afnan Almohsen
- Ahmed Alkhayatt
- Alaa Alsulmi
- Albandari Alanazi
- Aljoud Algazlan
- Arwa Alqahtani
- Aseel Alshehri
- Asma Alamri
- Bader Alrayes
- Banan alqhadi
- Basel Fakeeha
- Bassam Alasmari
- Bodoor Almubarak
- Bushra Abdulaziz
- Dimah Alotaibi
- Duaa Alhamoudi
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- Faisal Alnashwan
- Faisal Alotaibi
- Farah Al-sayed
- Fatimah Saad
- Fayez Altabbaa
- Feras Alqaidi
- Ghada Alabdi
- Ghada Aljedaie
- Ghada Alothman
- Ghaida Alassiry
- Hadi Alhemi
- Hamad Almousa
- Hesham Alsqabi
- Ibrahim Alabdulkarim
- Joud alnujaidi
- Khaled al osaimi
- Khaled Alsubaie
- Leen Almadhyani
- Leena Almazyad
- Mansour Aldossari
- Manal Altwaim
- May Barakah
- Mayasem Alhazmi
- Mohammed Alshunaif
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- Mohammed Alsenidi
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- Mohammed Beyari
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- Musab Alamri
- Nawaf Al-Shahrani
- Nawaf Alghamdi
- Nawaf Alsaadi
- Norah Alasheikh
- Norah Bamerai
- Nouf Alsubaie
- Noura aldashash
- Omar alkhalf
- Omar bassam
- Osama Alharbi
- Raed Alnutaifi
- Raghad Alasiri
- Raghad Soaeed
- Rakan Aldohan
- Rand Al Refaei
- Reem AlQahtani
- Reema alhadlaq
- Reema Alomar
- Renad Alosaimi
- Renad Alotaibi
- Saad Aldohaim
- Sadeem Alhazmi
- Sadeem Alzayed
- Saleh Algarni
- Sara Alharbi
- Sara alrashidi
- Sarah AlQuwayz 
- Sarah Alaidaroos
- Sarah Almuqati
- Sarah Alqahtani
- Sarah alqahtani
- Sarah Alrashidi
- Shaden Alobaid
- Shaden Alsaiedan
- Shahad almezel
- Shatha Aldhohair
- Shayma Alghanoum
- Sumo Alzeer
- Taif Almutairi
- Yara alasmari
- Yasmine Alqarni

We hope we didn't forget anyone...

QUIZ

Q1: The nipple of the breast lies opposite of? -Dr Sameerah

- A. 3rd costal cartilage
- B. 3rd intercostal space
- C. 4th intercostal space
- D. 4th costal cartilage

Q2: Which of the following helps the breast to move freely?

- A. Ligaments of Cooper
- B. Retromammary space
- C. Axillary tail
- D. Lobes and lobules

Q3: Where is the circular venous plexus found?

- A. At the apices of nipple
- B. At the base of nipple
- C. At the base of the breast
- D. Lateral to thoracic lymph nodes

Q4: Mammary ridge extends from the..... to the.....:

- A. Axilla, diaphragm
- B. Neck, inguinal region
- C. Axilla, inguinal region
- D. Axilla, umbilicus

Q5: Carcinomas of the breast mostly occur in -Dr Sameerah (IMP)

- A. Lower medial quadrant
- B. Lower lateral quadrant
- C. Upper medial quadrant
- D. Upper lateral quadrant

Q6: Peau d'orange appearance of the breast is due to the infiltration of:

- A. Pectoral fascia
- B. Ligament of Cooper
- C. Areola
- D. Lactiferous ducts

Q7: The primary reservoir for the lymphatic drainage from the breast is? -Dr Sameerah

- A. Subclavian nodes
- B. External mammary nodes
- C. Axillary nodes
- D. Subscapular nodes

Q8: The upper part of the breast drain into which group of Axillary lymph nodes? -Dr Sameerah

- A. Apical group
- B. Pectoral group
- C. Brachial group
- D. Central group



Members board

This amazing lecture was originally done
by 438's team

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