Anterior Pectoral Region and The Female Breast

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Components of the Anterior Pectoral Region

- Bones
  - Clavicle, Scapula & Humerus
- Joints
  - Acromioclavicular and Sternoclavicular
- Pectoral Muscles
  - Pectoralis Major & Pectoralis Minor
  - Subclavius, Serratus Anterior and Deltoid
- Clavipectoral fascia
- Mammary Gland

Bones of the Upper limb

- Clavicle
- Scapula
- Humerus
- Ulnar
- Radius
- Carpal bones
- Metacarpals
- Phalanges

Joints

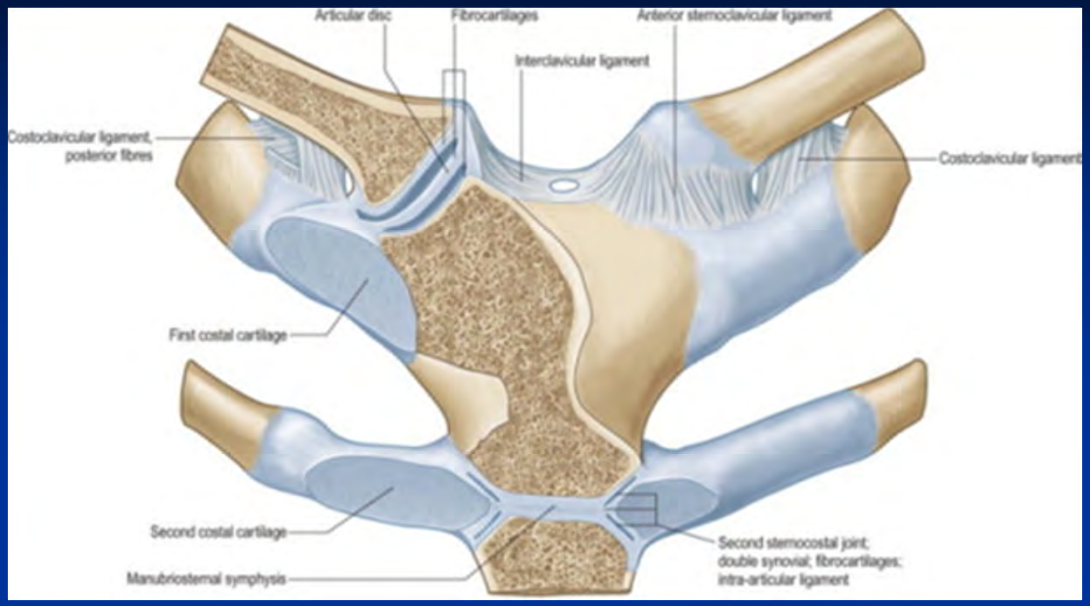
3 Types of Joints in general

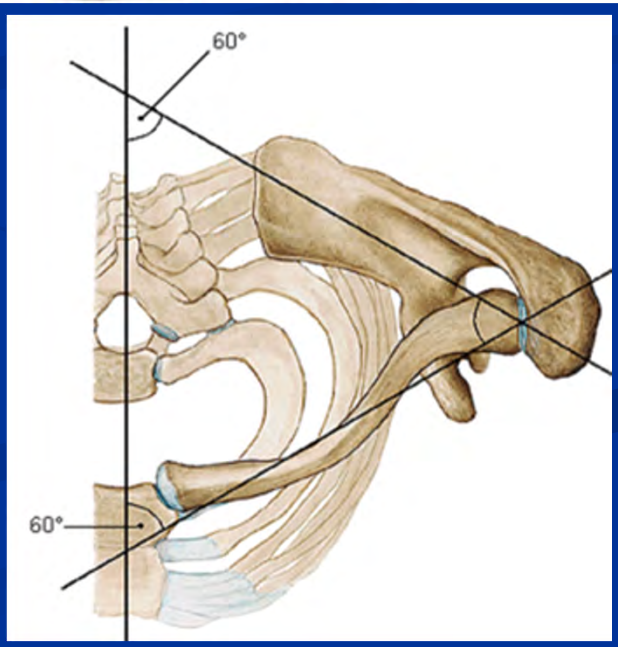
Fibrous - united by fibrous tissue

Cartilaginous - united by cartilage or cartilage and fibrous tissue

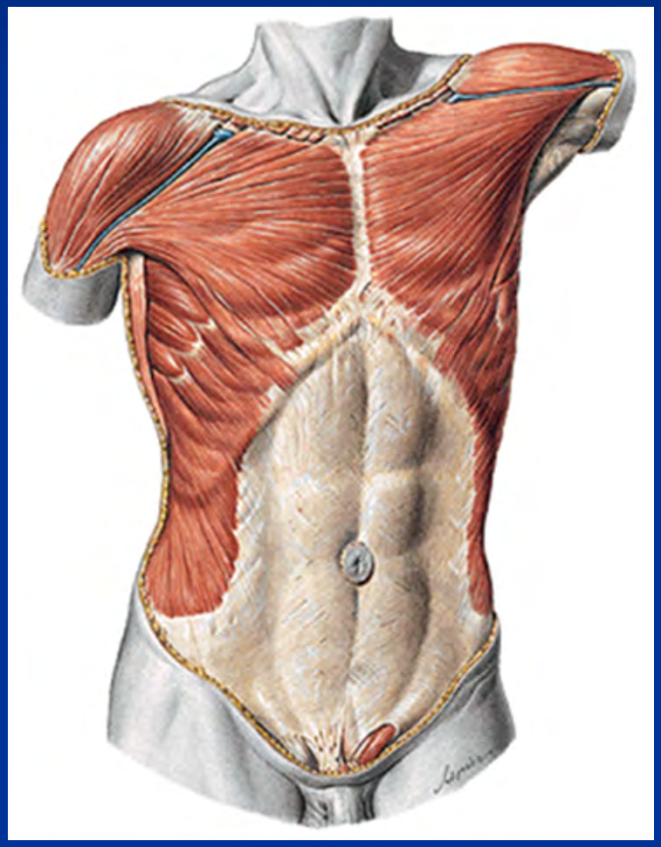
Synovial - united by cartilage with synovial membrane covering a joint cavity (joint cavity + articular capsule + cartilage)

- Sternoclavicular Joint
- Acromioclavicular Joint



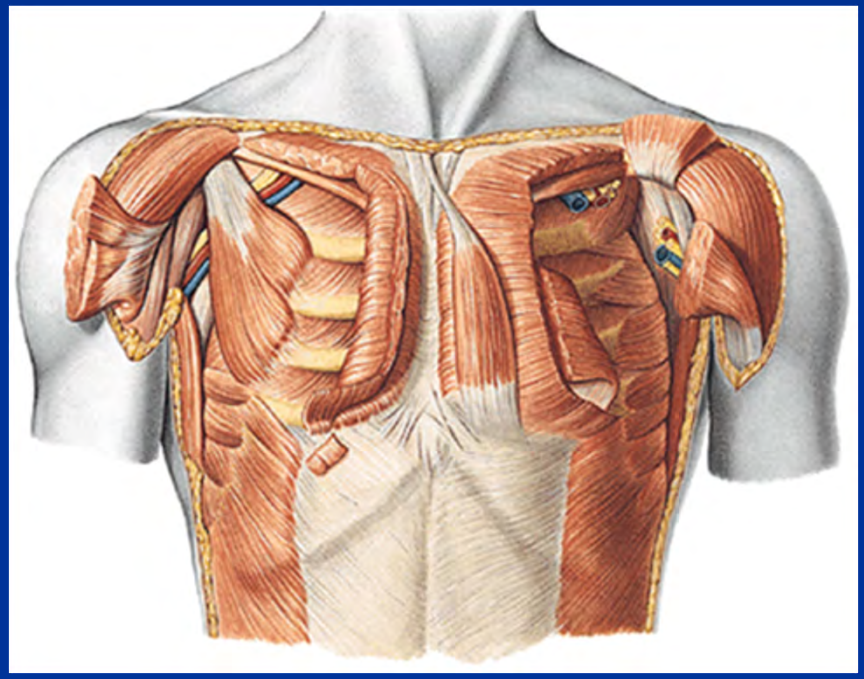


Pectoralis major



- **Origin**
  - Clavicle head – anterior surface of sternal half of clavicle
  - Sternal head – half the breadth of anterior surface of sternum down to level of 6th cartilage
  - 1st to 6th costal cartilages
  - Aponeurosis of external oblique muscle.
- **Insertion**
  - Lateral lip of intertubercular groove of humerus
- **Nerve supply**
  - Medial and lateral pectoral nerves
- **Action**
  - Adduction and medial rotation of humerus

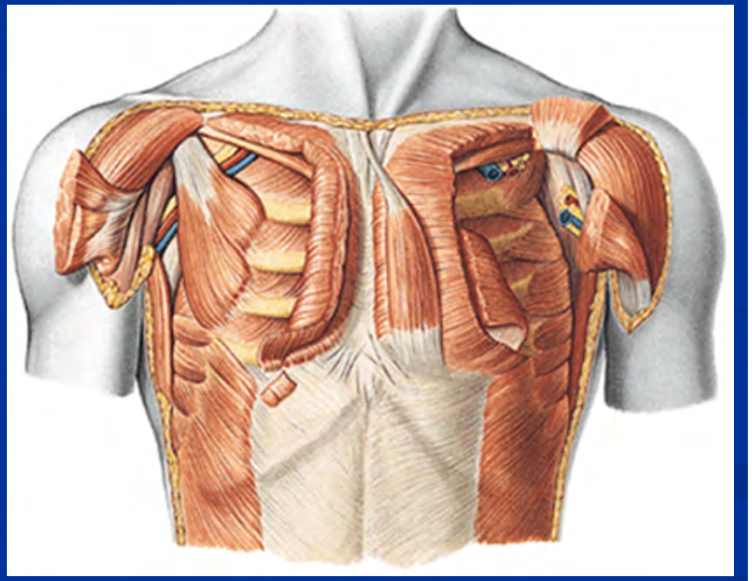
Pectoralis minor



- **Origin**
  - upper margins and outer surfaces of the third to fifth ribs, near costal cartilages
- **Insertion**
  - Medial border and upper surface of coracoid process of scapula
- **Nerve supply**
  - Medial and lateral pectoral nerves
- **Action**
  - Stabilizes scapula by drawing it forwards around the chest wall (Protraction)

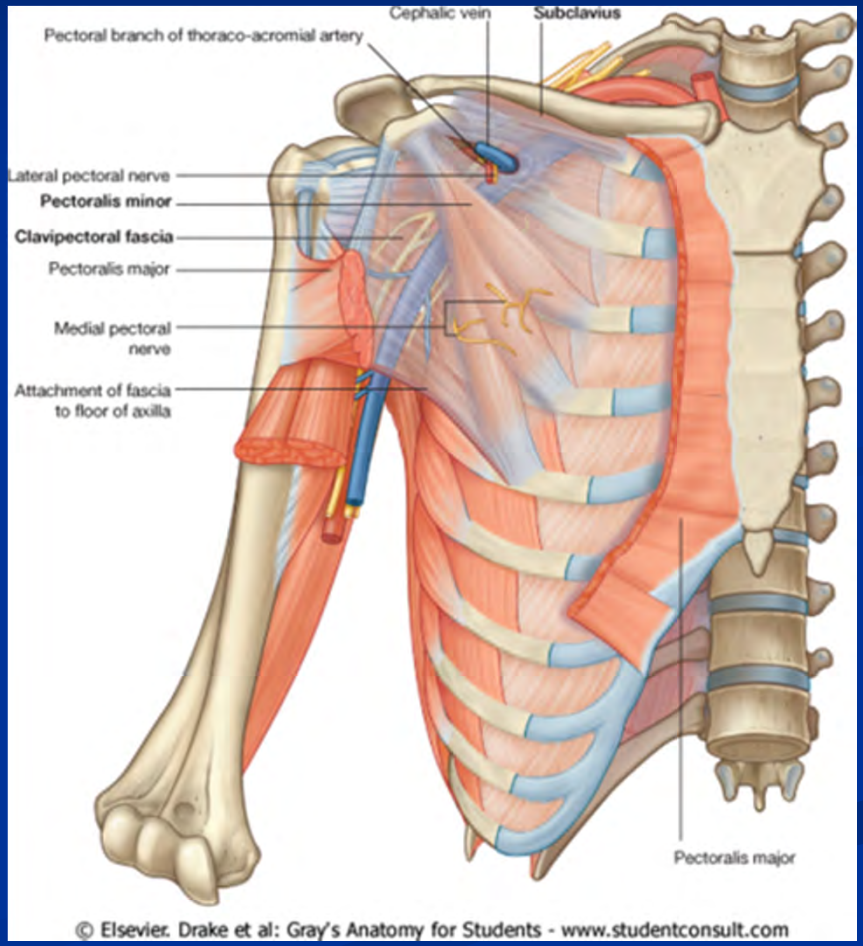
Complete the same exercise for the following muscles Pg 2 of 'Yellow book'

- Subclavius
- Serratus anterior
- Deltoid



Clavipectoral fascia

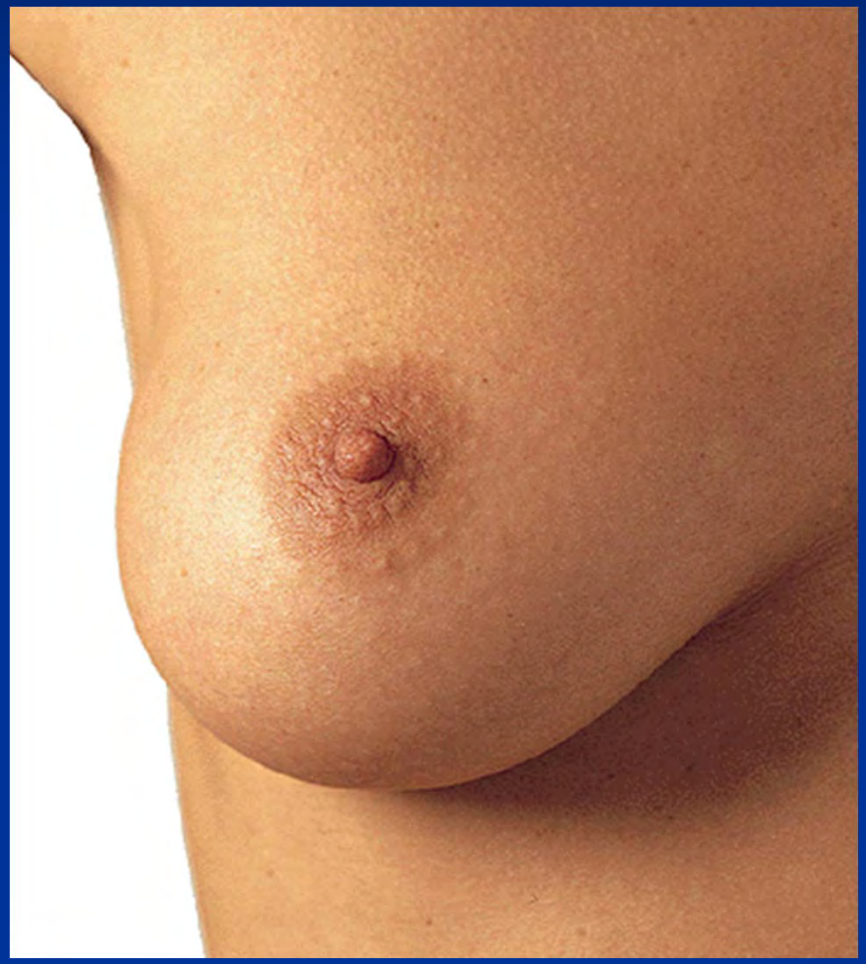
- **Extent**
  - Clavicle – Axillary fascia at floor
- **Enclosed structures**
  - Subclavius and pectoralis minor muscles
- **Piercing structures**
  - Medial & lateral pectoral nerves
  - Pectoral br of thoracoacromial artery
  - Cephalic vein



Female Breast Outline

- Definition (*what is it?*) & function (*what does it do?*)
- Position (surface markings if relevant), shape & size
- Components, borders, surfaces, etc.
- Special features (capsules, ducts, etc.)
- Relations (limited to adjacent structures)
- Arterial supply, venous & lymphatic drainages
- Nerve supply
- Applied Anatomy

Anterior & Lateral views

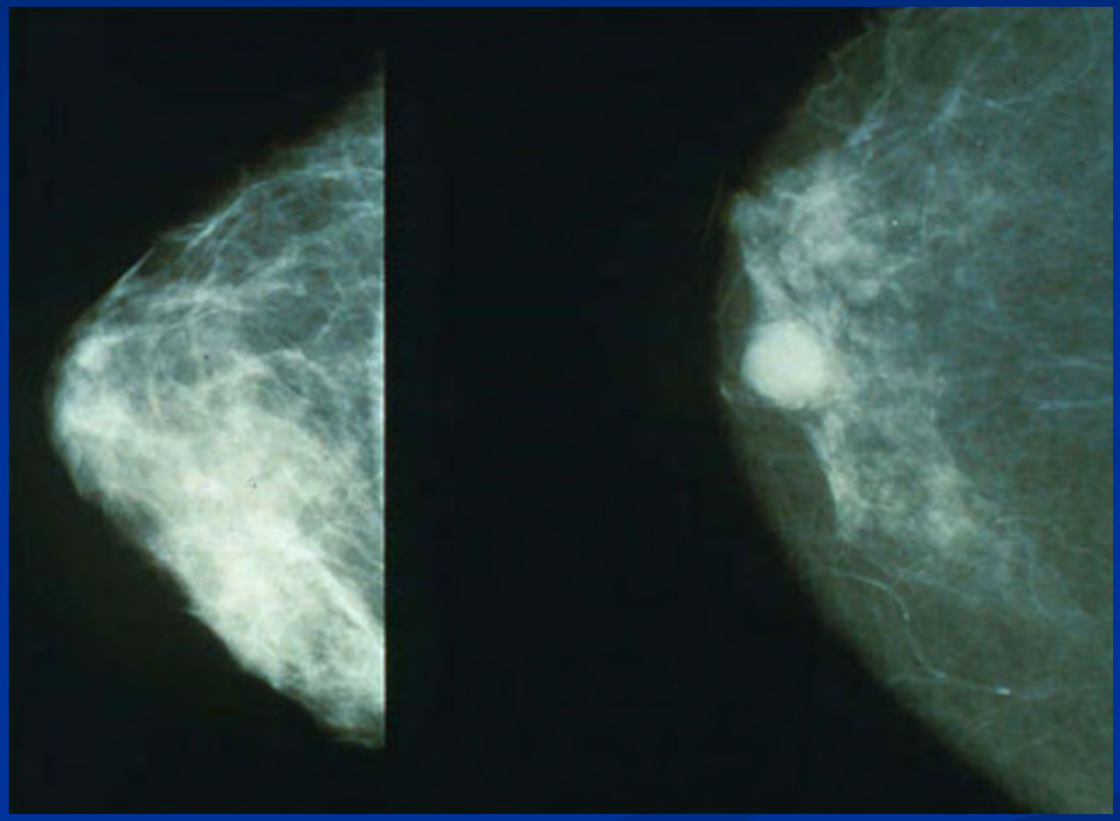


Introduction

- Definition & function
  - modified sweat gland - secretes milk
- Exist in both sexes
- Males
  - Rudimentary throughout life
  - Small ducts without alveoli
  - Little supporting adipose tissue
- Females
  - underdeveloped before puberty
  - undergoes considerable growth & enlargement at & after puberty & pregnancy.

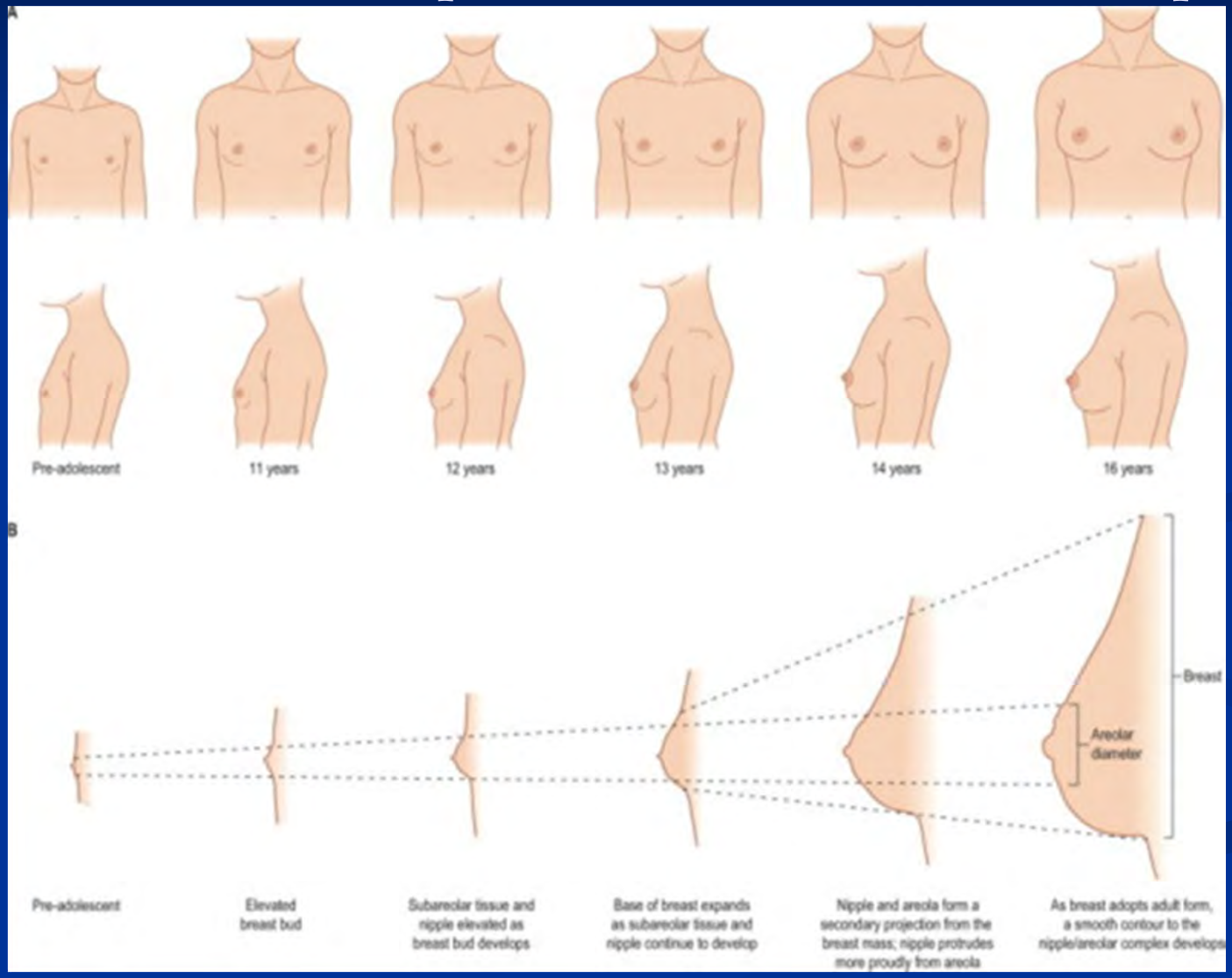
Changes in Female Breast

Breast of a pregnant female



Mammography

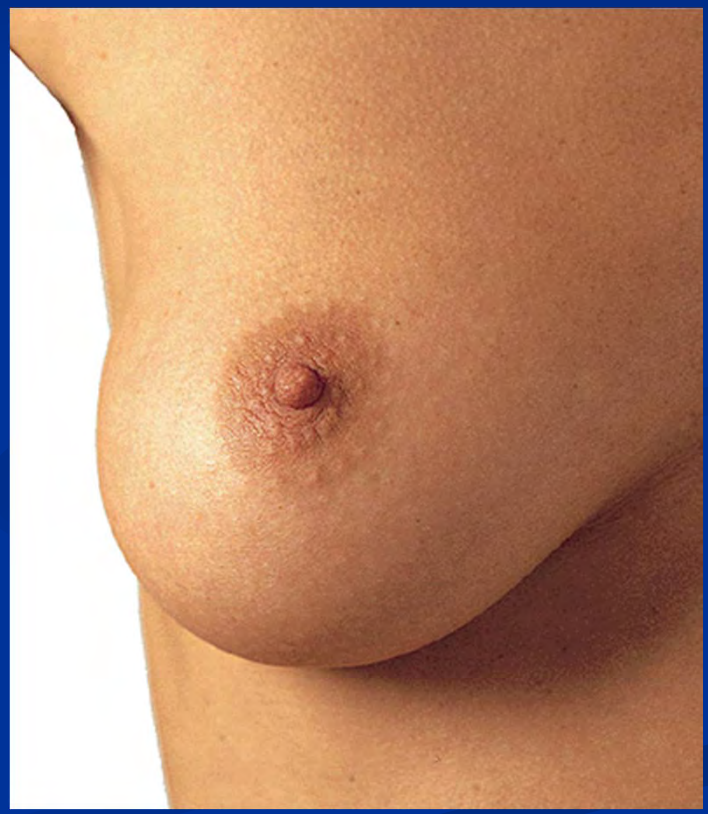
Age related changes in growth of female breast: Neonatal, Pubertal, Postpubertal, Menstrual, Postmenopausal



Gray's Anatomy 40th Ed

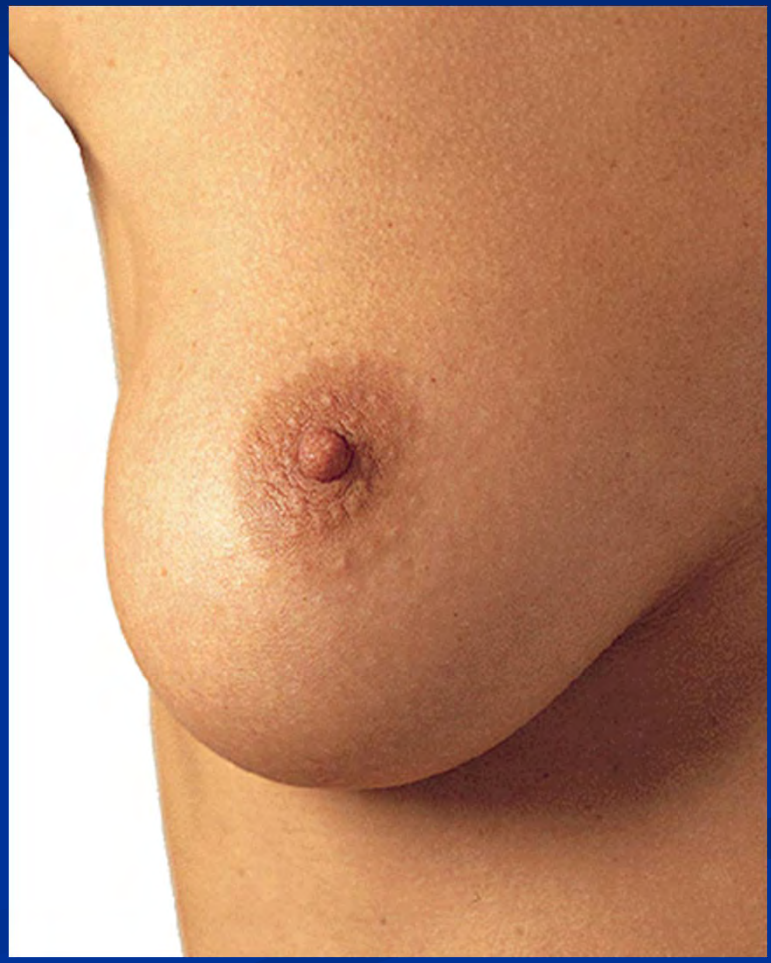
Shape

- Variable but size of base is fairly constant
- Protuberant
  - hemispherical
  - conical in young females
  - Large & pendulous in older females
    - Fat dependent
  - Milk producing structure same



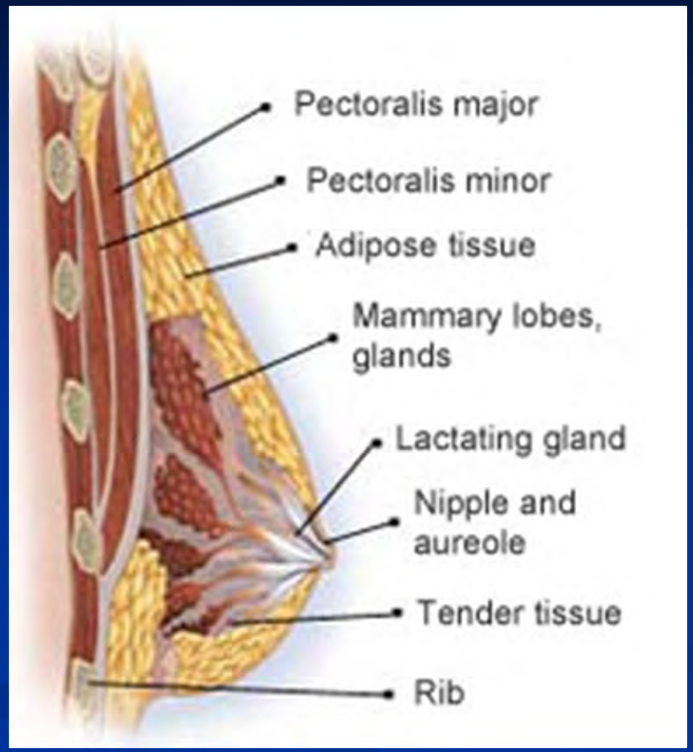
Position & Relations

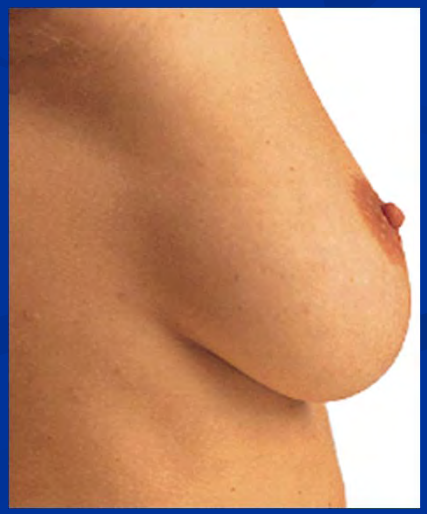
- 2nd to 6th ribs
- Horizontally
  - 4th intercostal cartilage
  - sternum (medial border) to near midaxillary line
- Superolateral part
  - prolonged upwards & laterally towards axilla (axillary tail of Spence)



Position & Relations…

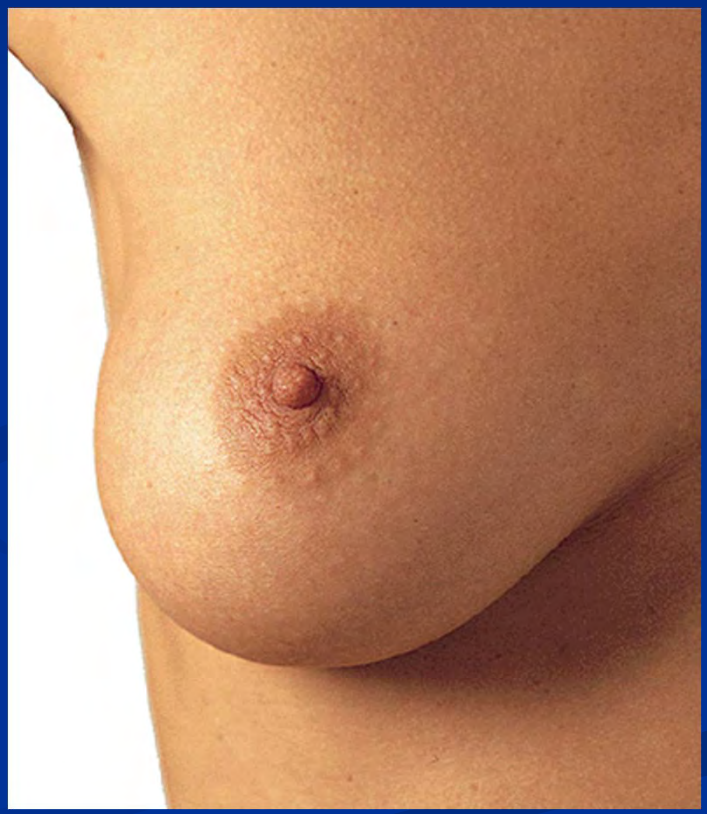
- ⅔ lies on pectoralis major
- ⅓ on serratus anterior & external oblique muscles





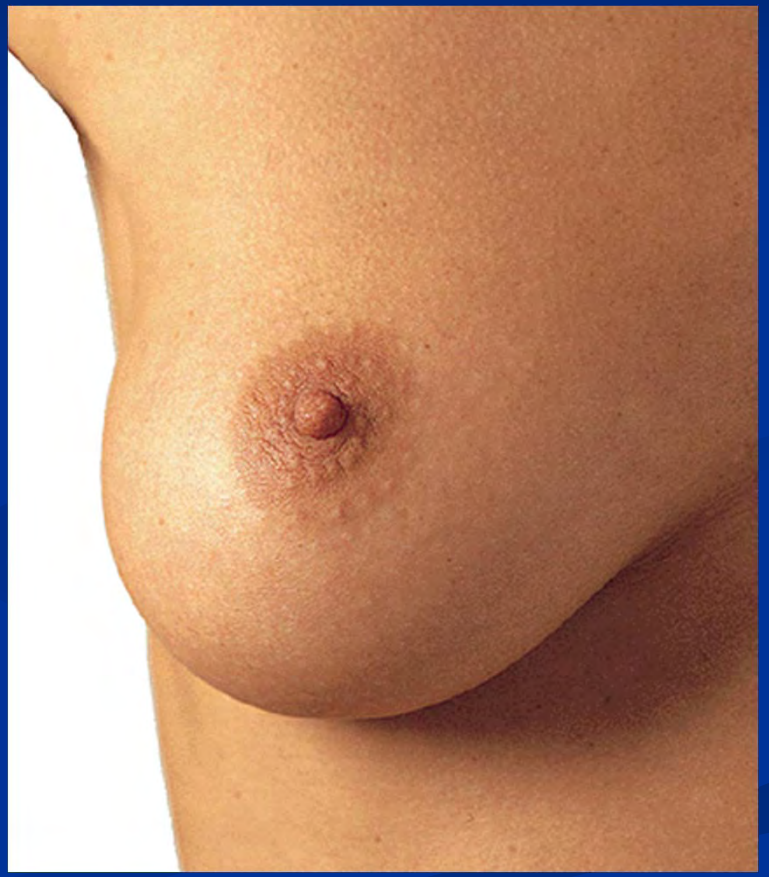
External Features

- Mammary papilla (Nipple)
  - conical
  - 4th intercostal space in nulliparous females
  - variable in multiparous females
- Pink or light brown in colour.



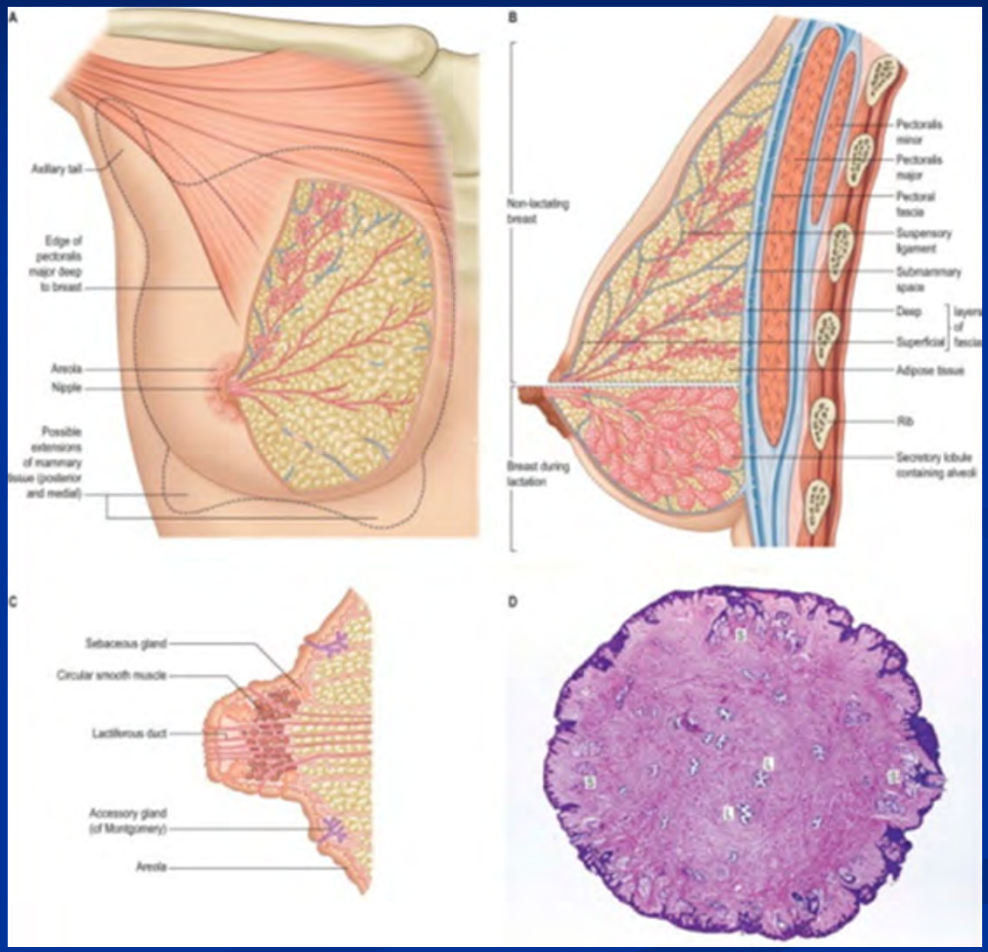
Areola

- Base of nipple
- pigmented area of skin (1-2cm)
  - usually rose pink in nulliparous white females
  - ↑ in size & darker with 1st pregnancy (3 months)
  - Never returns to original colour
  - Contains areolar (sebaceous) glands of Montgomery
    - produce little irregularities



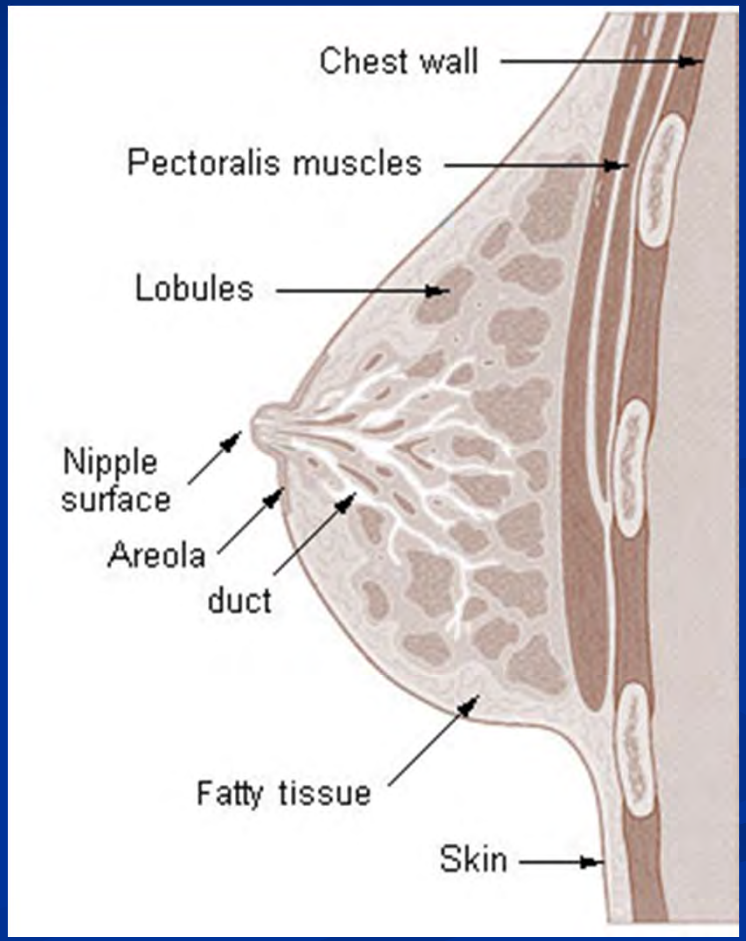
Structure

- Entire gland in superficial fascia (retromammary space)
- 5-20 separate lobes of glandular tissue
  - tubulo-alveolar type
  - each separated from its neighbour by fibrous CT



Suspensory ligaments of Cooper

- Fibrous processes from deep fascia to skin & papilla
  - Support glandular lobes
  - Ligaments may become contracted by fibrosis in cancer of breast
    - *'pitting of the breast'*



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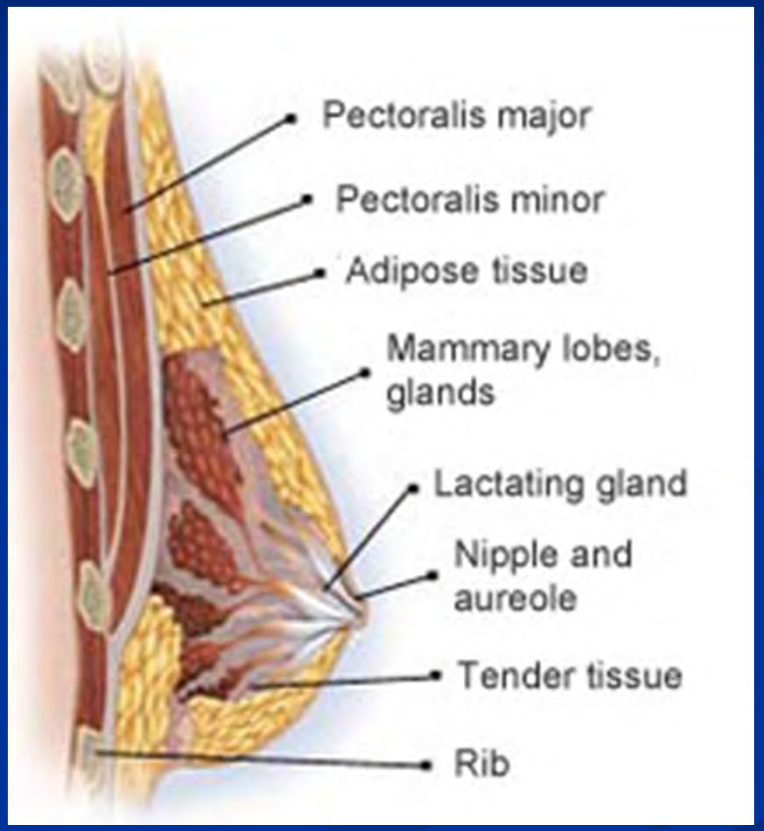
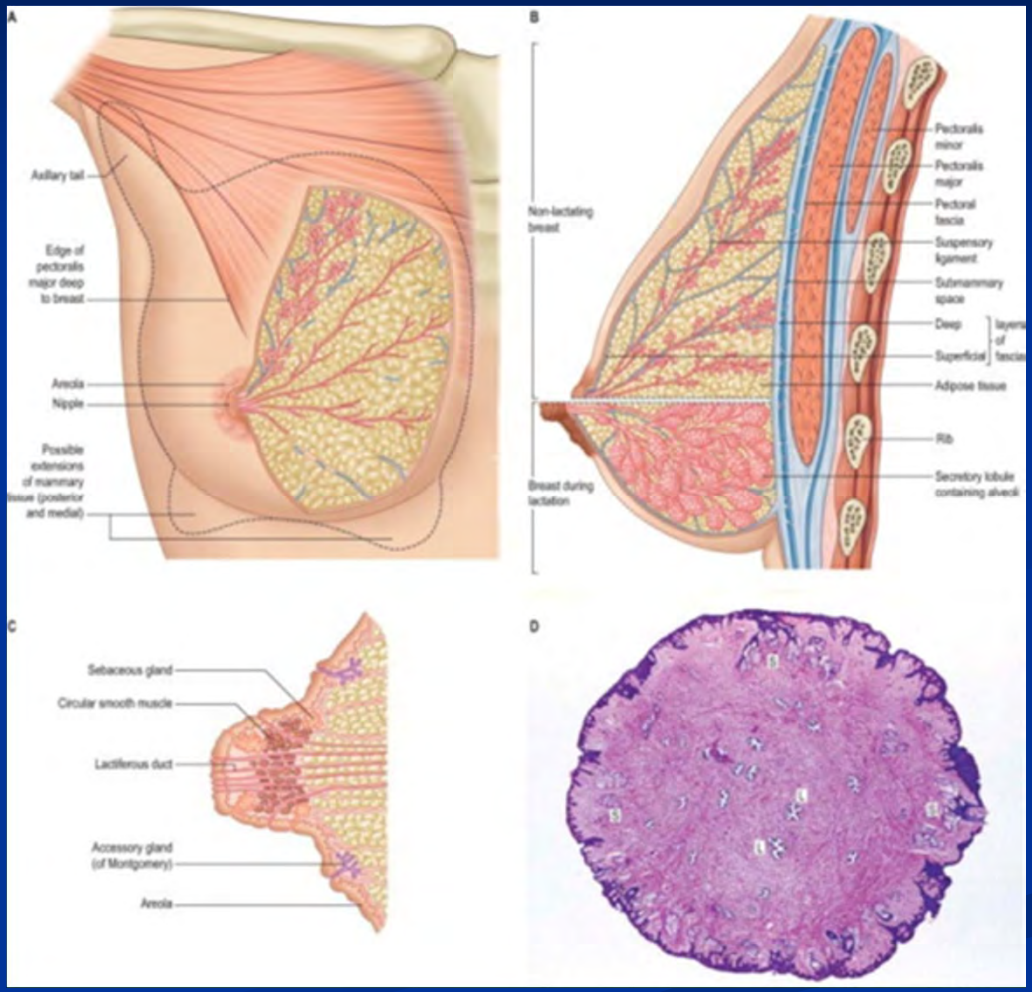
Ducts

- Base of nipple, ducts narrow down, change direction from horizontal to vertical & run to summit of nipple.
- Dilations of ducts beneath areolar area - lactiferous sinuses (ampullae)
  - act as reservoirs for milk



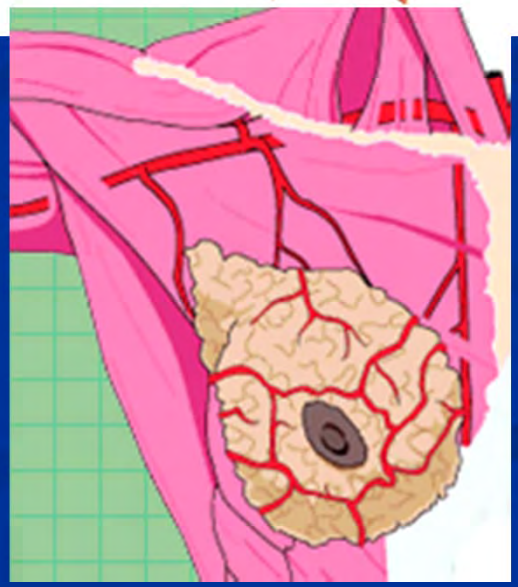
Ducts…

- Terminal lactiferous ducts are larger near central end of each lobe & converge towards nipple.



Blood Supply

- Perforating branches - internal thoracic art (subclavian) 2nd-4th interspaces
- Perforating branches - 3rd – 5th intercostal arteries
- Superior thoracic - 1st part of axillary artery

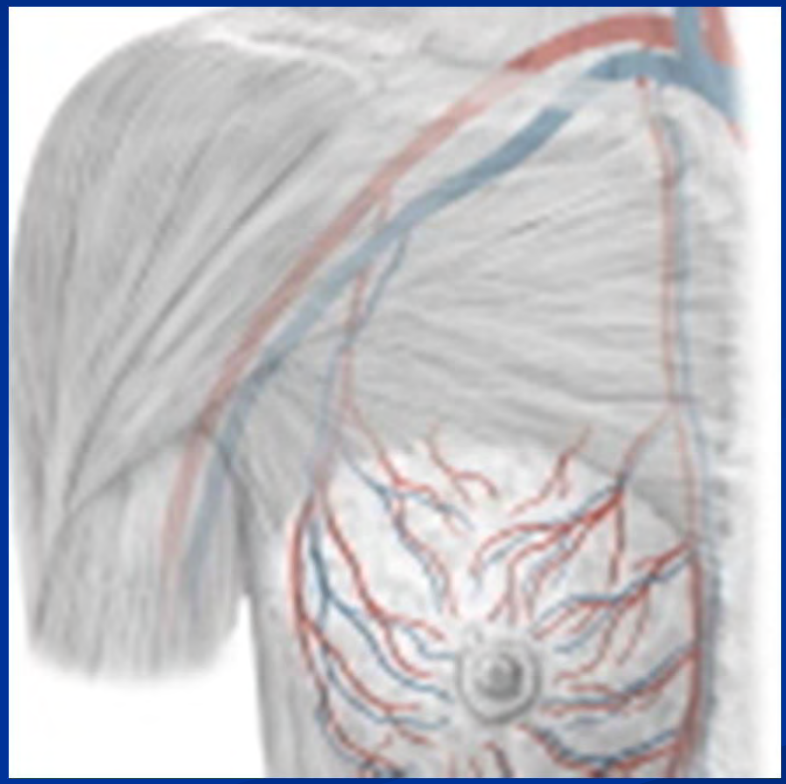


Blood Supply

- Pectoral branches - thoracoacromial - 2nd part of axillary artery
- Lateral thoracic - 2nd part of axillary artery
- Subscapular - 3rd part of axillary artery

Venous Drainage

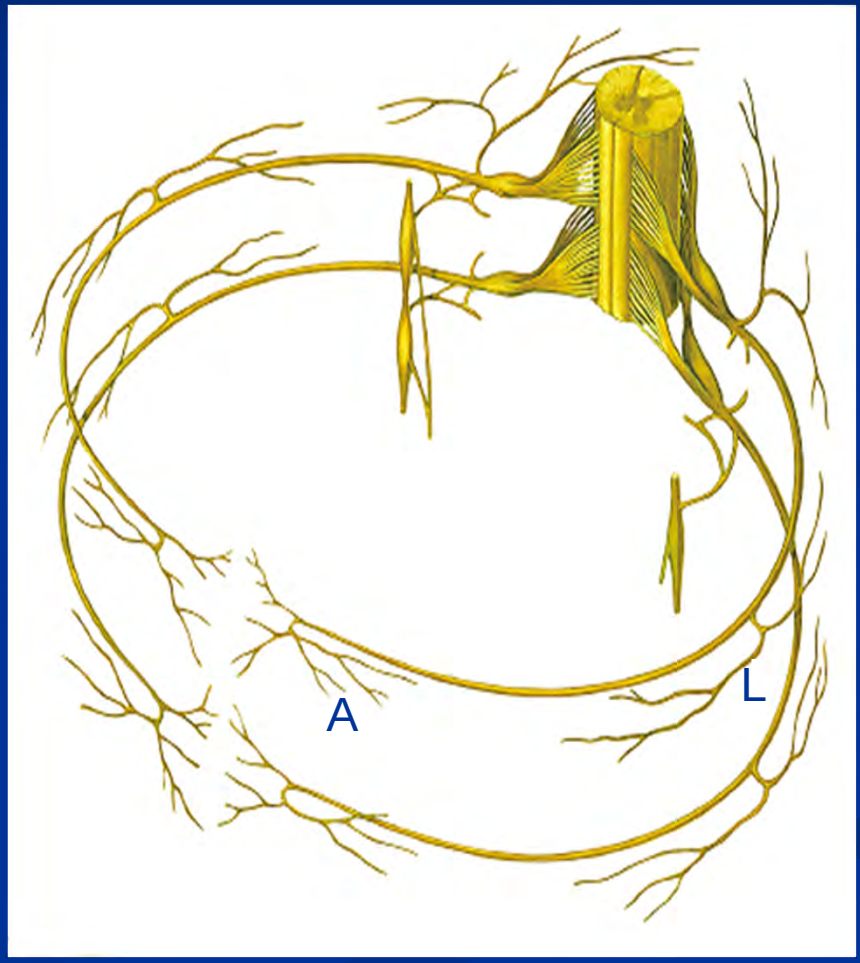
- Anastomotic circle around nipples (circulus venosus) into axillary & internal thoracic veins via intercostal veins.



Nerve Supply

- Anterior & Lateral cutaneous branches of 3, 4, 5 & 6 intercostal nerves

- Convey sympathetic fibres
- Nervous plexus around nipple is important in signalling suckling

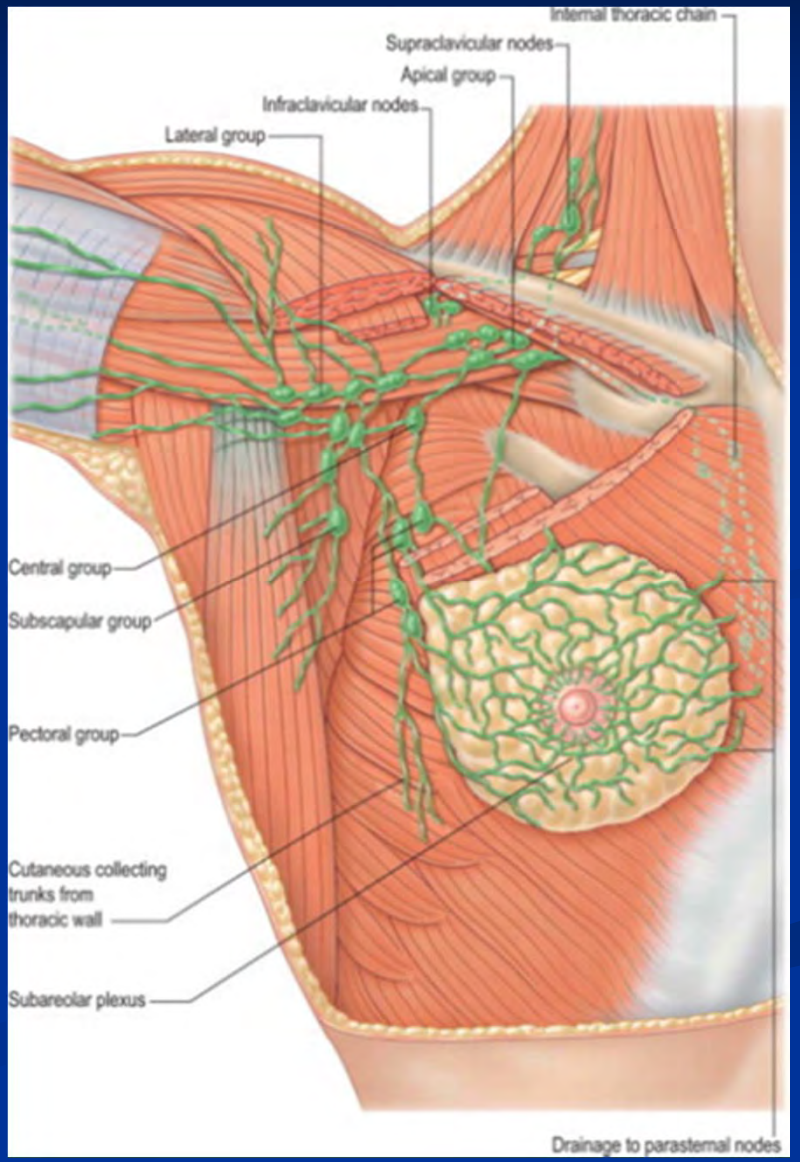


Lymphatic Drainage – Axillary Group

- Receives 75%

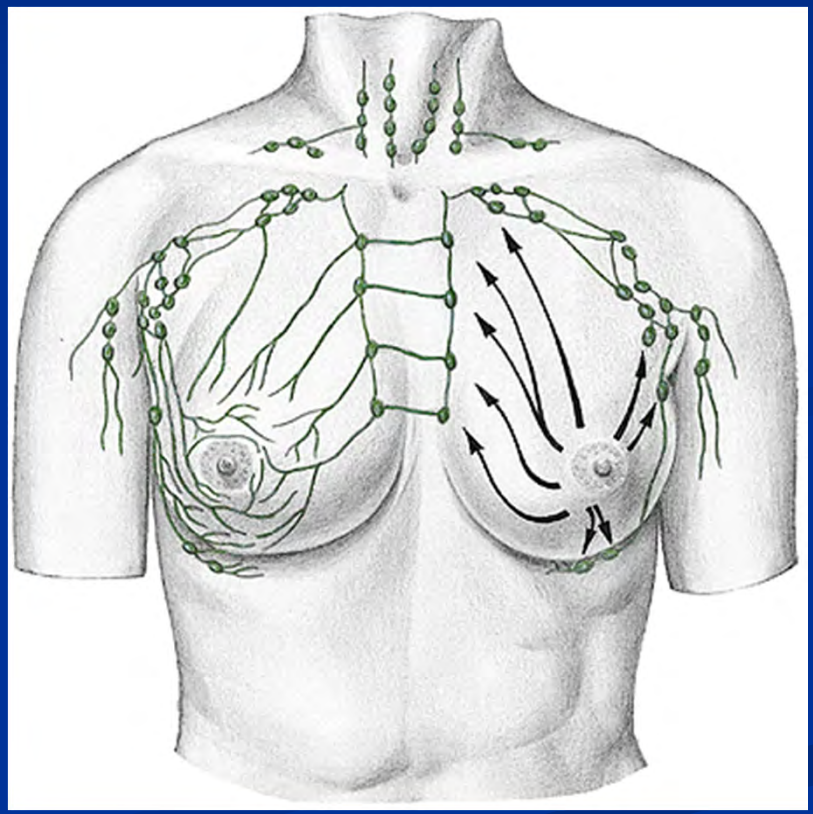
- Lateral – Upper limb only
- Pectoral (ant), lat border of P Major - central & lateral parts
- Subscapular (post), - along subscapular vessels - axillary tail
- Central – in axillary fat - nodes below

- Apical (behind clavicle)
  - upper & peripheral parts + CSPL nodes
  - End in subclavian lymph trunk (Lt in thoracic duct; Rt in subclavian vein of Rt jugular trunk



Lymphatic Drainage…

- Parasternal Group (20%)
  - Anterior ends of intercostal spaces along internal thoracic artery
  - medial convexity
- Intercostal Group (5%)
  - Intercostal vessels
- Sappey's plexus – nipple + areola



Sample Question!

Describe the lymphatic drainage of the female breast.

Describe the pattern of drainage of the female breast by the axillary group of lymph nodes?

Clincal Anatomy 5th ed

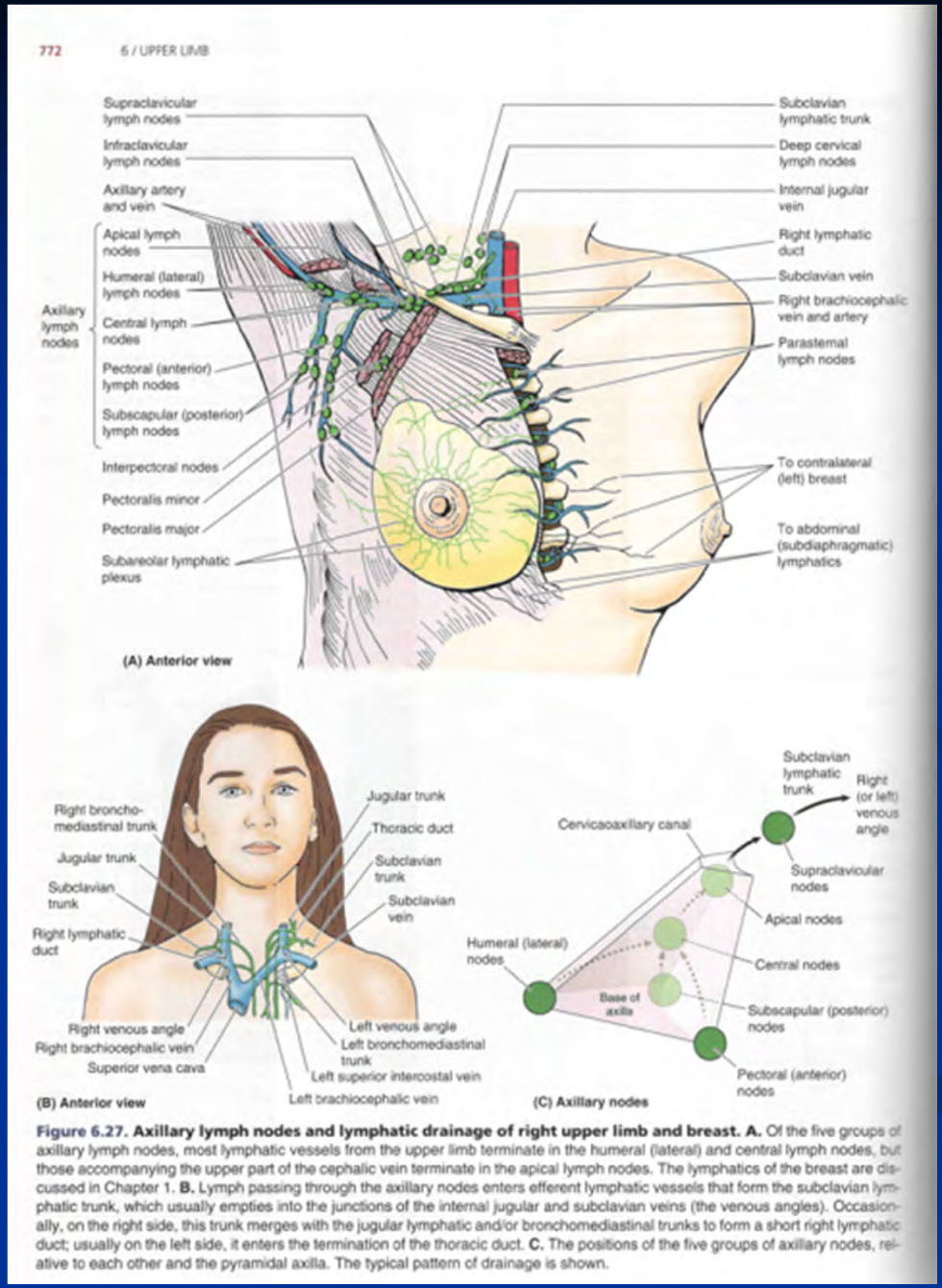


Figure 6.27. Axillary lymph nodes and lymphatic drainage of right upper limb and breast. A. Of the five groups of axillary lymph nodes, most lymphatic vessels from the upper limb terminate in the humeral (lateral) and central lymph nodes, but those accompanying the upper part of the cephalic vein terminate in the apical lymph nodes. The lymphatics of the breast are discussed in Chapter 1. **B.** Lymph passing through the axillary nodes enters efferent lymphatic vessels that form the subclavian lymphatic trunk, which usually empties into the junctions of the internal jugular and subclavian veins (the venous angles). Occasionally, on the right side, this trunk merges with the jugular lymphatic and/or bronchomediastinal trunks to form a short right lymphatic duct; usually on the left side, it enters the termination of the thoracic duct. **C.** The positions of the five groups of axillary nodes, relative to each other and the pyramidal axilla. The typical pattern of drainage is shown.

Applied Anatomy

- Appreciation of lymph flow is important clinically
  - Primary route of metastasis of breast cancer
  - For performing & interpreting a node biopsy

Applied Anatomy

- Breast cancer – most common form of Ca in women
  - Spreads via lymphatics, vascular channels & fibrous tissue
  - Leading cause of Ca incidence among women in South Africa (16.6 %) *Sitas et al 1998*
- Incisions – radial as ducts maintain a radial course
- Cyst (galactocole) – may develop with blockade of a lactiferous duct

Applied Anatomy…

- Peau D' orange
  - Pits of hair follicles appear to be retracted beneath level of surrounding skin
  - blockage of lymphatic drainage of skin, leading to stagnation of lymph & oedema of skin.
- Retraction of Skin
  - Invasion of ligaments of Cooper leading to dimpling
- Retraction of Nipple
  - Extension of growth along milk line ducts with subsequent retraction as fibrosis occurs leading to indrawn nipple.

Applied Anatomy - Congenital…

- Polymastia (1 or 2 mammae) or polythelia (1 or more nipples)
  - May occur in males or females usually along a line extending from axilla to pubic region (*milk line*)

  Gynaecomastia
  - Hypertrophy of male breast often after puberty from hormonal imbalance (oestrogenic & androgens)
  - May secret milk!
- Amastia
  - Absence of breast on one or both sides.

Applied Anatomy