Mammography

Breast Anatomy

MRT Program

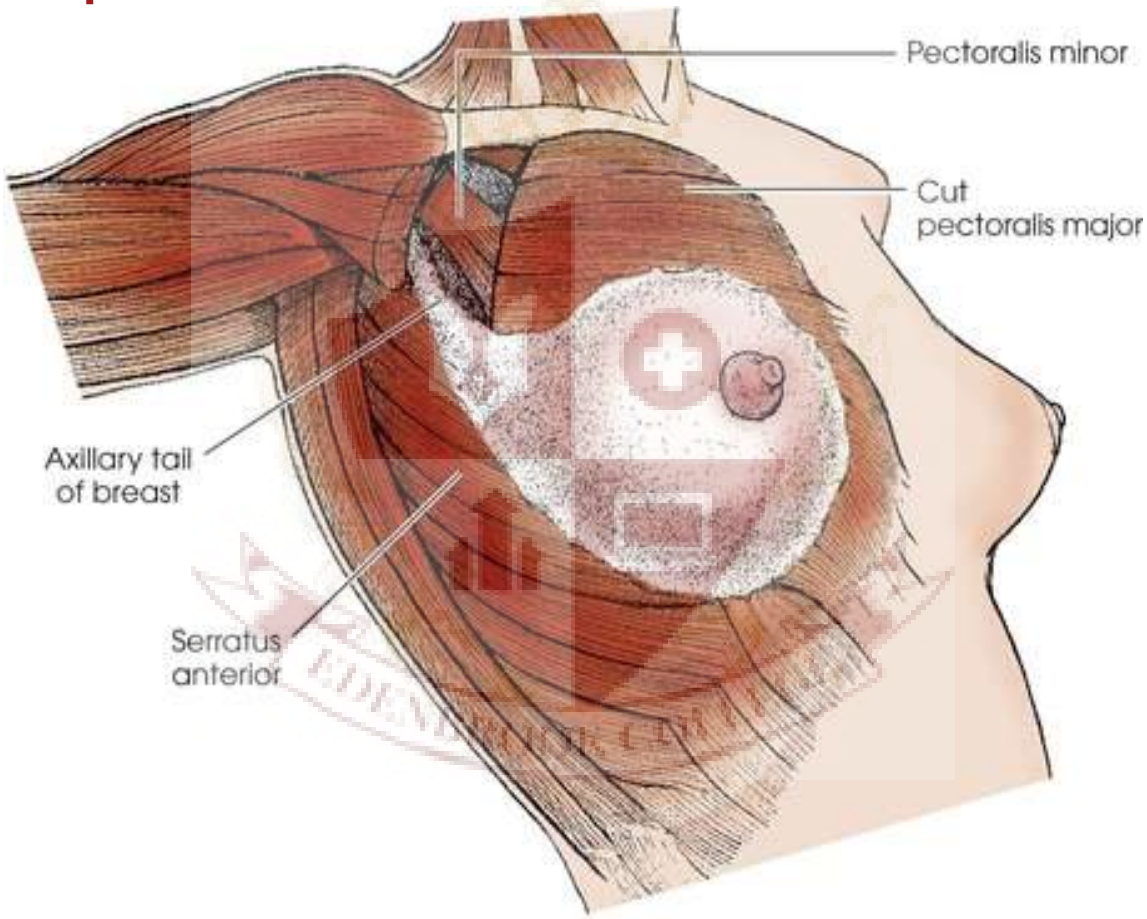
Breast Anatomy

- Lobulated glandular structures located in the superficial fascia of anterolateral surface of the thorax
- Divide the superficial fascia into anterior and posterior components
- Mammary tissue is completely surrounded by fascia and enveloped between anterior and posterior layers if the superficial fascia
- Female breasts vary considerably in size and shape depending on amount of fat and glandular tissue and the condition of the suspensory ligaments
- Each breast is usually cone shaped base overlies pectoralis major and serratus anterior muscles (second and third rib inferiorly to sixth and seventh rib from near lateral margin of the sternum laterally toward the anterior axillary plane)

Breast Anatomy

- An additional portion of the breast tissue, the axillary prolongation or axillary prolongation or axillary tail (AT) extends from the upper lateral base of the breasts into the axillary fossa

Relationship of Breast to Chest Wall



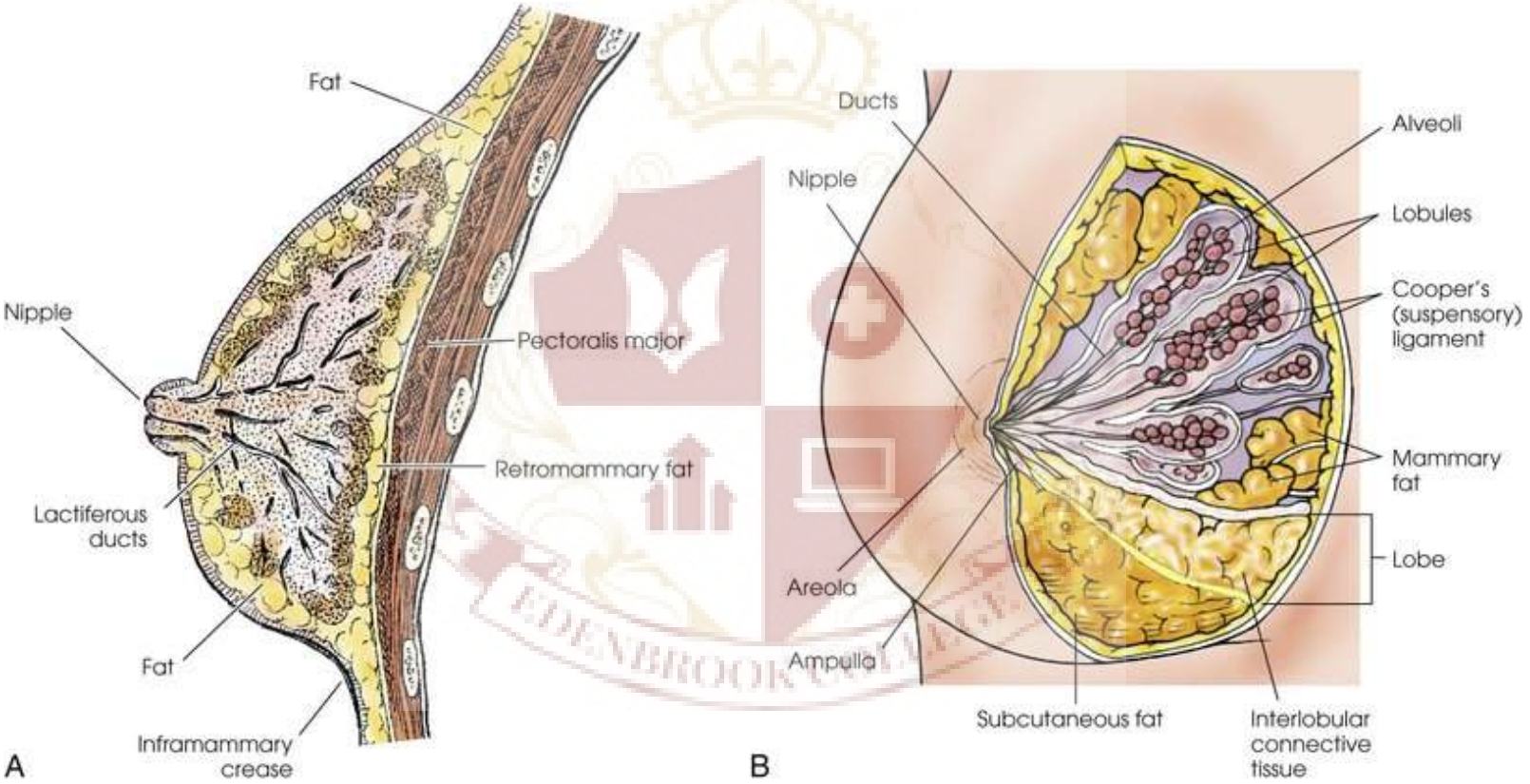
Breast Anatomy

- Breast tapers anteriorly from the base ending in the nipple surrounded areola
- Supported by Coopers ligaments, suspensory ligaments that extend from the posterior layers of superficial fascia through the anterior fascia into subcutaneous tissue and skin
- These ligaments give degree of firmness to breast tissue

Breast Anatomy

- Consists of 15-20 lobes more superior and lateral location and divided into many lobules
- Individual lobes are incompletely separated from one another by Coopers ligaments
- The space between the lobes contain fatty tissue and additional connective tissue
- Layer of fatty tissue surrounds the gland, except under the areola and nipple

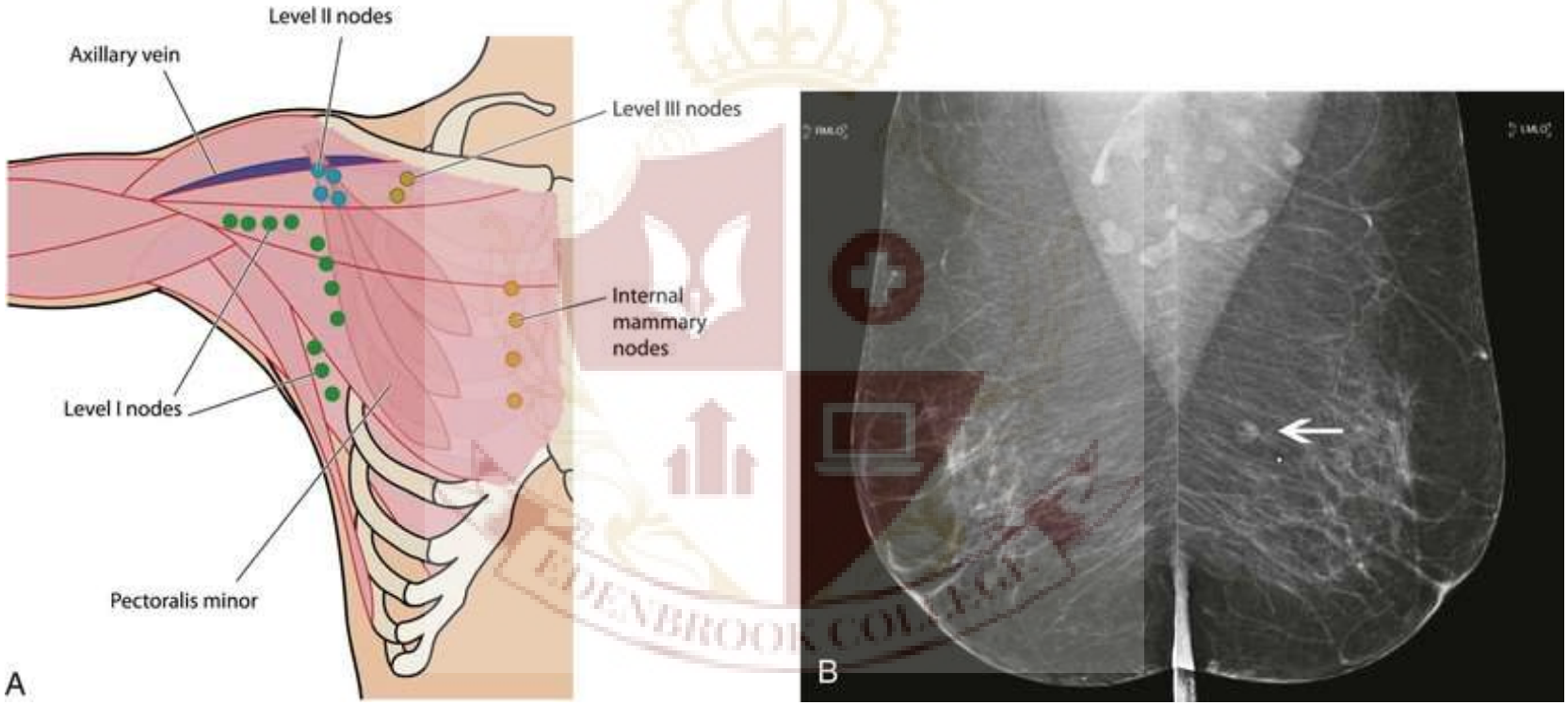
Breast Anatomy



Breast Anatomy

- Lymphatic vessels of breast drain laterally into Axillary lymph nodes and medially into the chain of internal mammary lymph nodes
- 75% lymph drainage is toward the axilla
- Axilla is radiographed sometimes for evaluation of axillary lymph nodes
- Internal mammary nodes sit behind the sternum and seen if enlarged on lateral chest radiograph

Lymphatic Nodes



Breast Anatomy

- Natural mobility of the breast is important consideration
- Lateral and inferior are more mobile
- Superior and medial aspects are fixed
- Effectively positioned by moving mobile aspects towards fixed tissues.
- Should avoid moving compression paddle against fixed tissue as less breast tissue would be imaged

Tissue Variations

- Glandular and connective tissues of the breasts are soft tissue- density structures
- Ability to show radiographic detail depends on fat within and between the breast lobules and the fat surrounding the breasts
- Post puberty adolescent breast contains primarily dense connective tissue- homogenous radiographic image with little tissue differentiation
- Development of glandular tissue decreases radiographic contrast

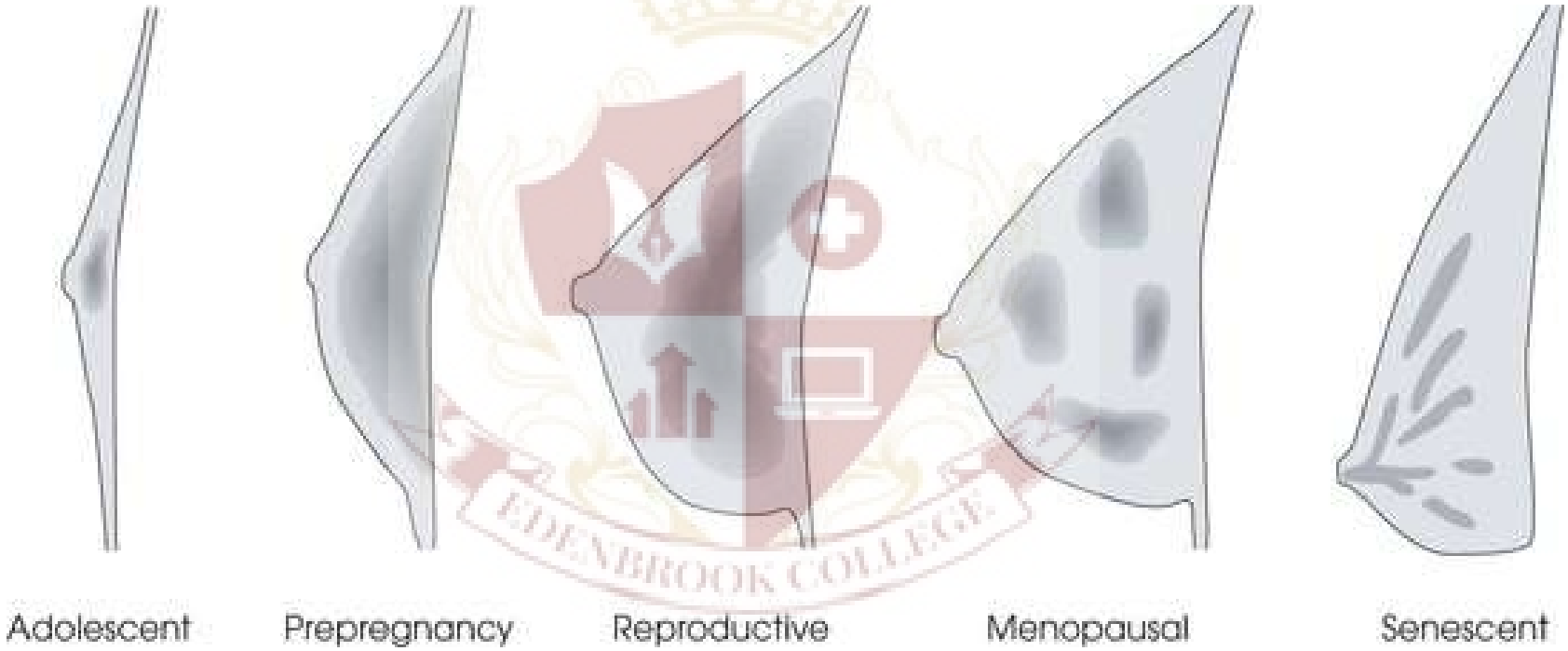
Tissue Variations

- With pregnancy significant hypertrophy of glands and ducts occur within the breasts and become extremely dense and opaque
- After the end of lactation, involution of glandular and parenchymal tissues are replaced with increased amounts of fatty tissue
- Significantly increases natural radiographic contrast within the breasts
- Glandular and connective tissues of the breast can regenerate as needed for other pregnancies

Tissue Variations

- Post menopause, the glandular and stromal elements undergo gradual atrophy
- From puberty through menopause hormones influence cyclic change in the breasts

Breast Tissue Variations

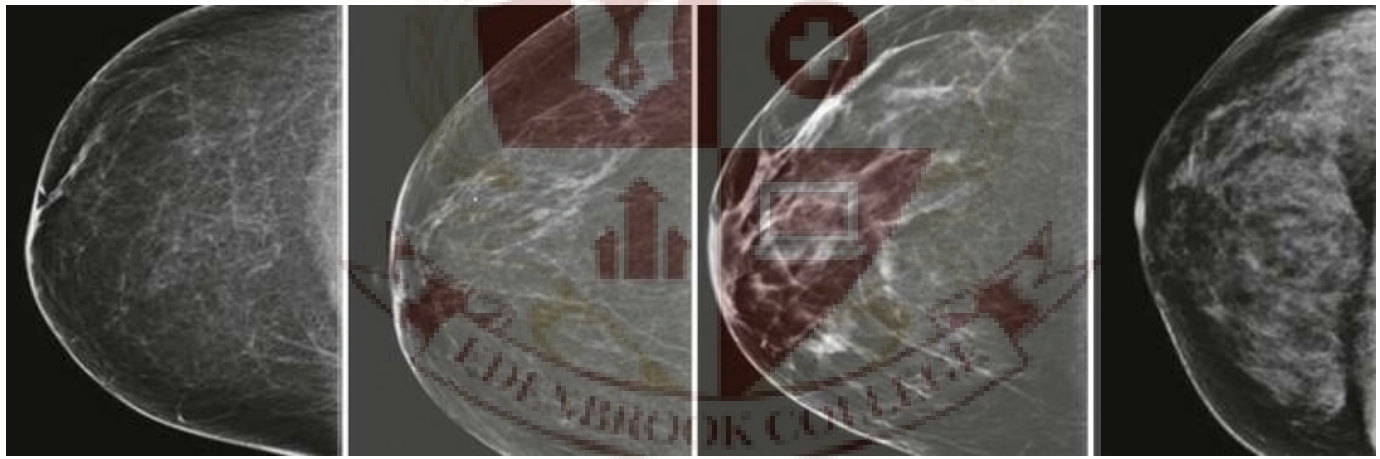


Tissue Variations

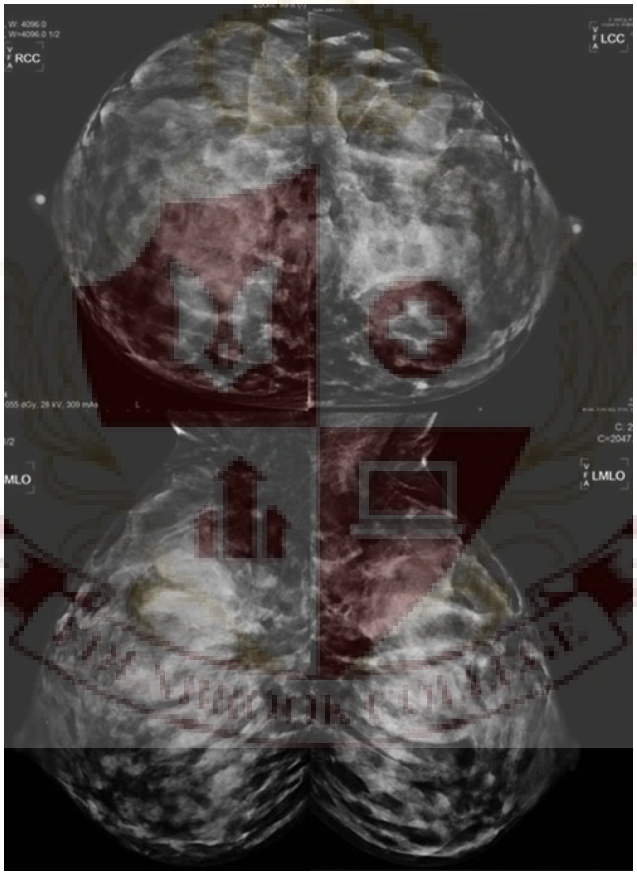
- Breast tissue density is the ratio of fatty to glandular tissue within the breast
- More glandular tissue= more challenge for x-rays to penetrate
- Classified into three or four density ranges (depending on textbook)
- Fatty-common age group 50 + / post meno minimal radiographic density
- Fibrofatty – 30-50 yrs. / young women 3 or more pregnancies/50 / 50 split
- Average density
- Fibroglandular – 15 yrs. to 30 yrs. childless/ lactating or pregnant radiographically dense-little fat

Tissue Variations

- Radiologist can classify into 4 categories
- Fatty, Scattered, Heterogeneously dense, Extremely dense



Lactation and Radiographic Density



Exposure Factors and Compression

- Fatty breast tissue is compressed easily and requires less exposure than Fibroglandular
- Technologist must be mindful of compression on Fibroglandular tissue as it's very uncomfortable for the patient