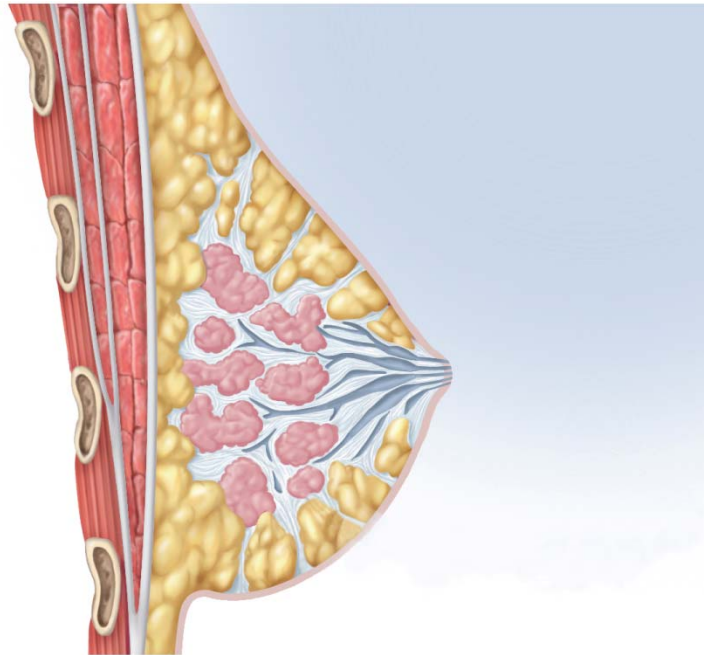


Chapter 28

Breasts and Mammary Glands



Breasts and Mammary Glands

- **breast** – mound of tissue overlying the pectoralis major
 - enlarges at puberty and remains so for life
 - most of the time it contains very little mammary gland
- **mammary gland** – develops within the breast during pregnancy
 - remains active in the lactating breast
 - atrophies when a woman ceases to nurse
- two principal regions of the breast:
 - **body** – conical to pendulous, with the nipple at its apex
 - **axillary tail** – extension toward the armpit
 - lymphatics in axillary tail are important as a route for **breast cancer metastasis**

Breasts and Mammary Glands

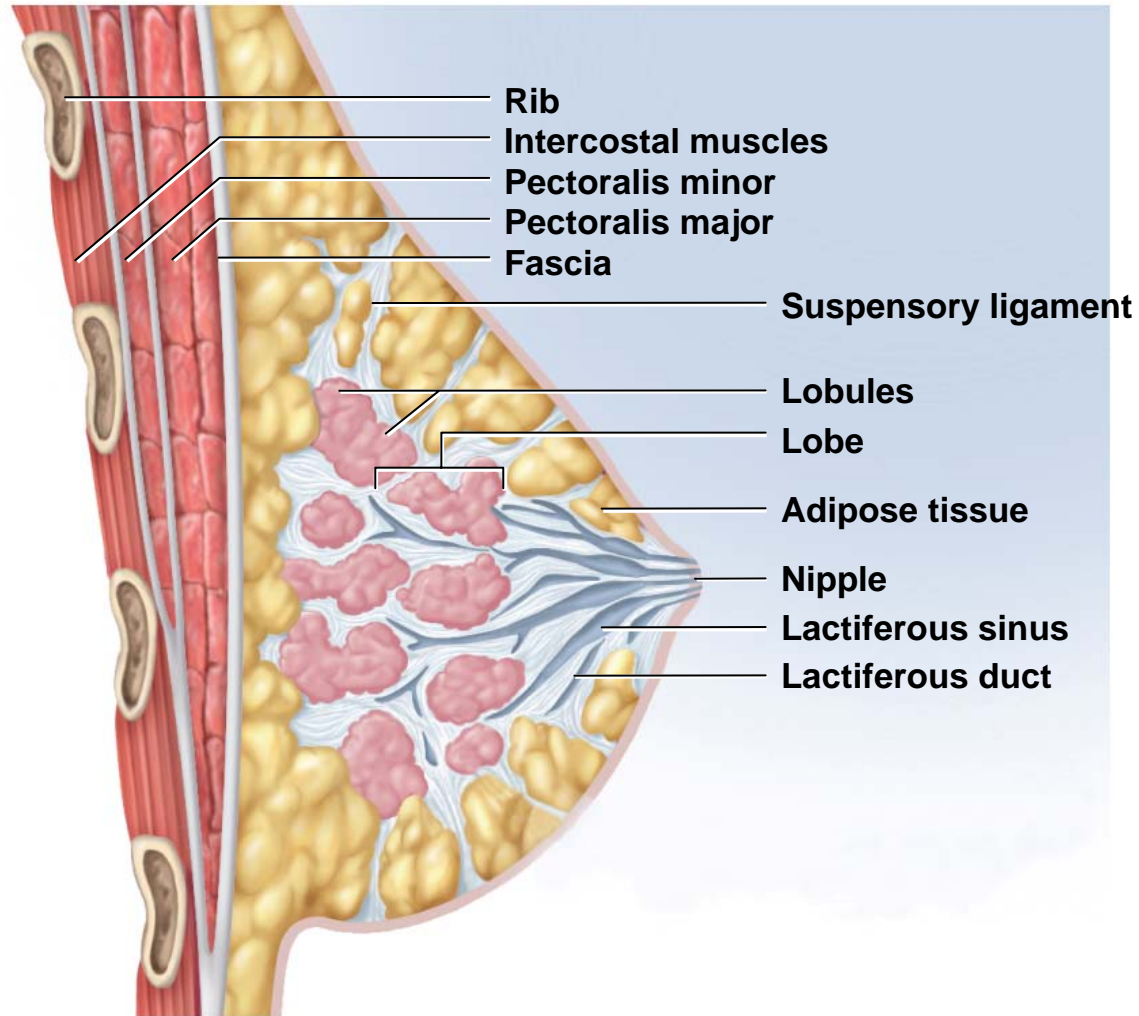
- nipple surrounded by circular colored zone the **areola**
 - blood capillaries and nerves closer to skin surface – more sensitive
 - sensory nerve fibers of areola trigger a **milk ejection reflex** when an infant nurses
 - **areolar glands** – intermediate between sweat glands and mammary glands
 - secretions protect the nipple from chapping and cracking during nursing
 - **smooth muscle fibers** in dermis of areola that contract in response to cold, touch, and sexual arousal wrinkling the skin and erecting the nipple

Breasts and Mammary Glands

- the **nonlactating breast** consists mostly of adipose and collagenous tissue
 - breast size determined by amount of adipose tissue
- **suspensory ligaments** attach breast to dermis of overlying skin and fascia of the pectoralis major
- **system of ducts** through fibrous stroma and converge on the nipple
 - mammary gland develops during pregnancy
 - 15 to 20 **lobes** around the nipple
 - **lactiferous duct** drains each lobe
 - dilates to form **lactiferous sinus** which opens into the nipple

Anatomy of Lactating Breast

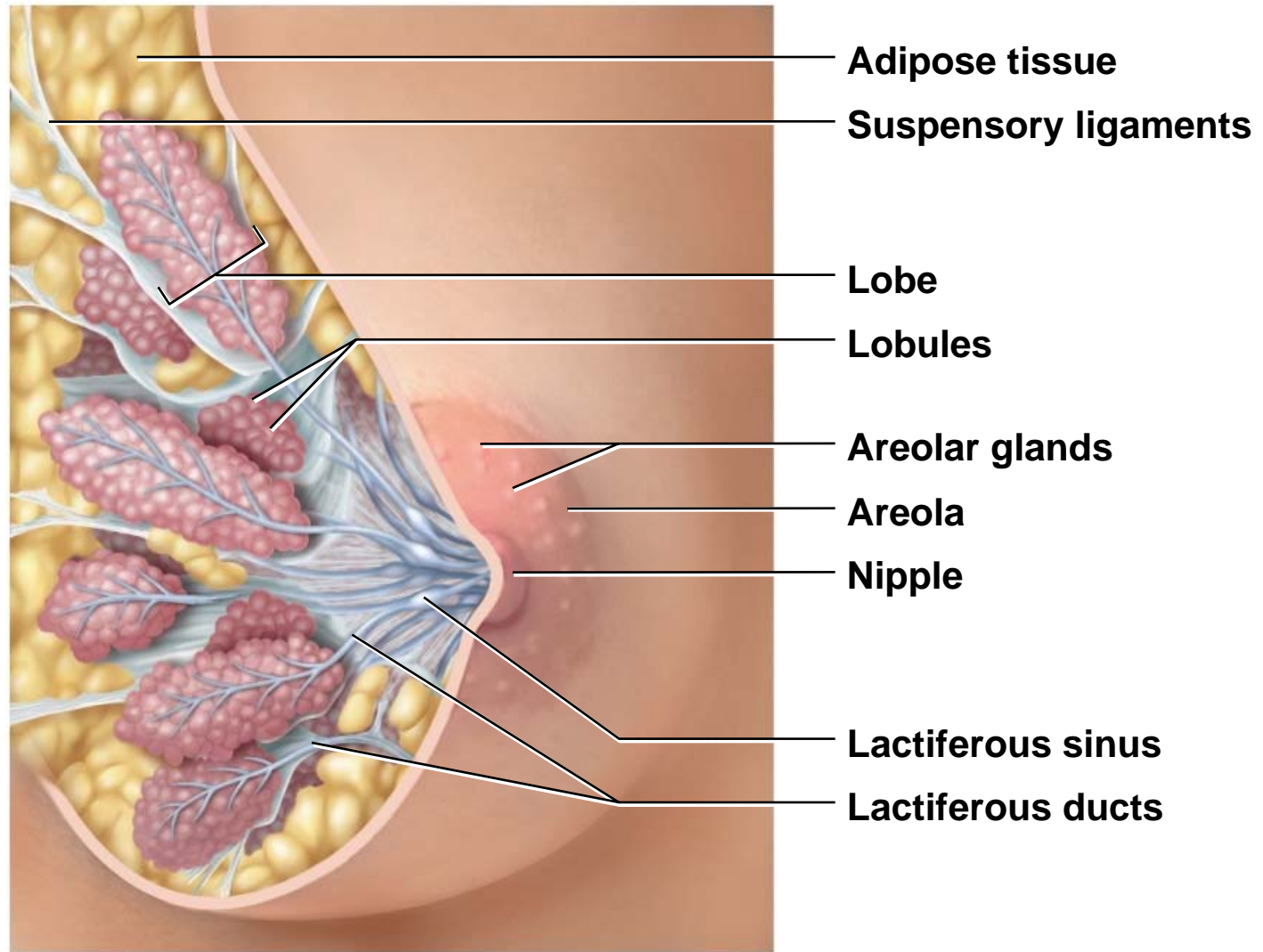
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(c) Sagittal section

Anatomy of Lactating Breast

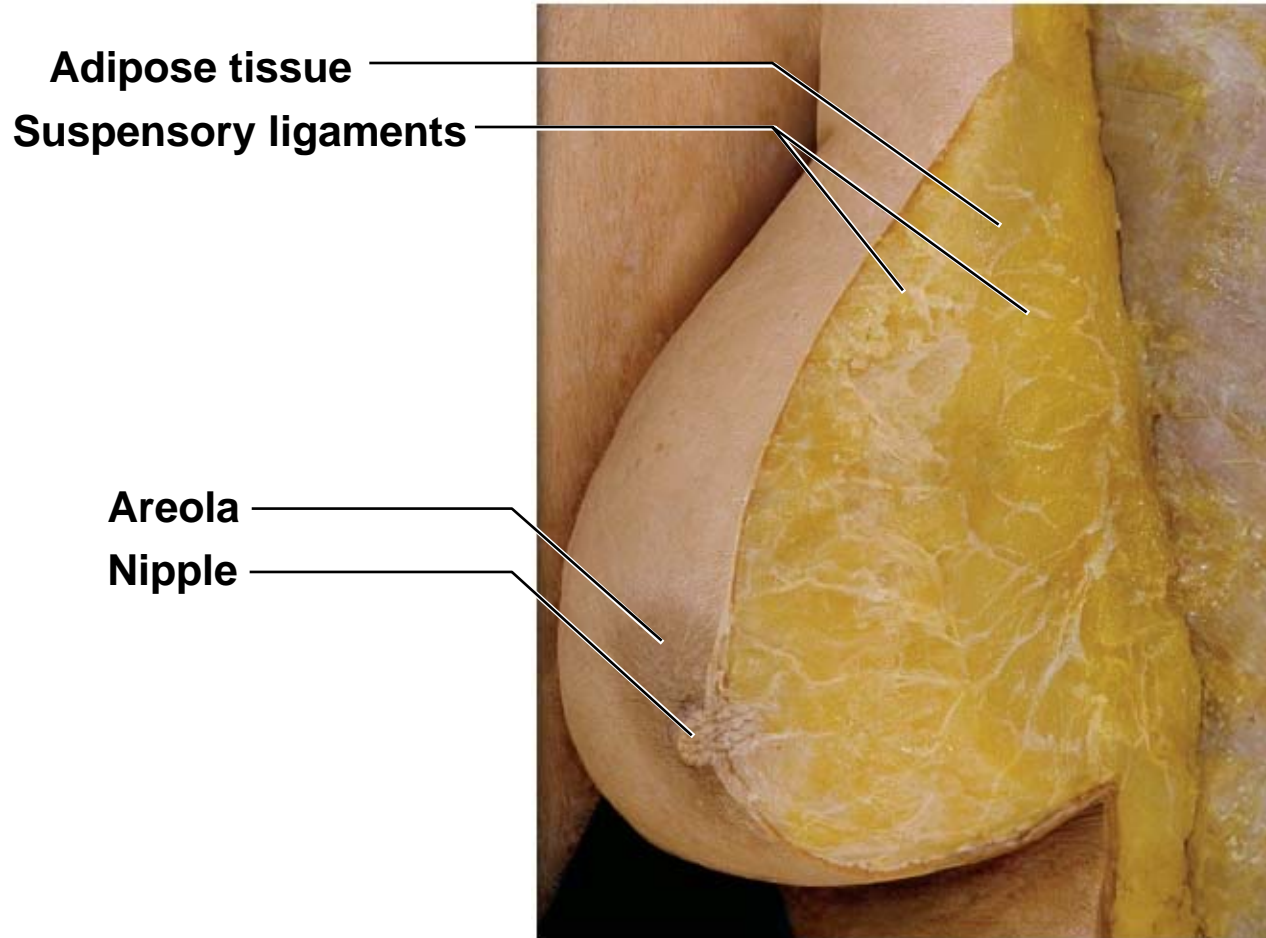
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(a) Anterior view

Breast of Cadaver

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(b) Breast of cadaver

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Breast Cancer

- breast cancer occurs in 1 out of 8 American women
- tumors begin with cells from mammary ducts
 - may metastasize by mammary and axillary lymphatics
- signs may include palpable lump (the tumor), skin puckering, changes in skin texture, and drainage from nipple
- most breast cancer is nonhereditary
 - two breast cancer genes were discovered in the 1990s
 - BRCA1 and BRCA2
 - some stimulated long periods of fertility and estrogen exposure
- risk factors include
 - aging, exposure to ionizing radiation, carcinogenic chemicals, excessive alcohol and fat intake, and smoking
 - 70% of cases lack identifiable risk factors

Breast Cancer

- tumor discovery usually during breast self-examination (BSE) – monthly for all women
- **mammograms** (breast X-rays)
 - late 30s – baseline mammogram
 - 40 - 49 - every two years
 - over 50 – yearly
- **treatment of breast cancer**
 - **lumpectomy** – removal of tumor only
 - **simple mastectomy** – removal of the breast tissue only or breast tissue and some axillary lymph nodes
 - **radical mastectomy** – removal of breast, underlying muscle, fascia, and lymph nodes
 - surgery followed by **radiation** or chemotherapy
 - **breast reconstruction** from skin, fat, and muscle from other parts of the body

Cancer Screening and Treatment

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(c)

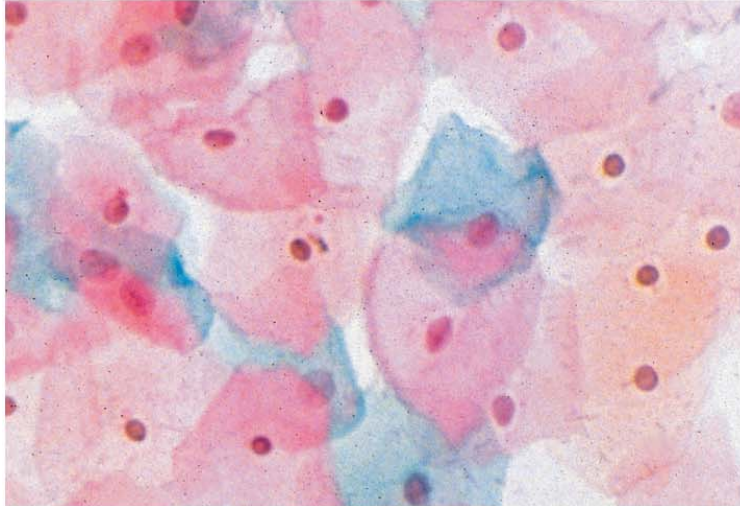


(d)

Biophoto Associates/Photo Researchers, Inc.

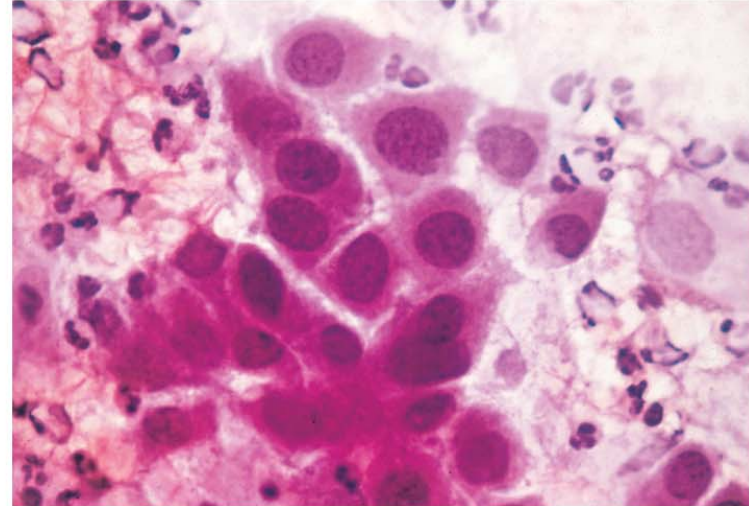
PAP Smears and Cervical Cancer

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(a) Normal cells

20 μm



(b) Malignant (CIN III) cells

20 μm

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- cervical cancer common among women 30-50
 - smoking, early age sexual activity, STDs ,and human papillomavirus
 - usually begins in epithelial cells in lower cervix
- best protection against cervical cancer is early detection by **PAP smear**
 - cells removed from cervix and vagina and microscopically examined
- three grades of **cervical intraepithelial neoplasia**
 - class I mild dysplasia, class II calls for a biopsy, class III results may call for radiation therapy or hysterectomy