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

(c) Sagittal section
Anatomy of Lactating Breast

Adipose tissue
Suspensory ligaments
Lobe
Lobules
Areolar glands
Areola
Nipple
Lactiferous sinus
Lactiferous ducts

(a) Anterior view
Breast of Cadaver

Adipose tissue
Suspensory ligaments
Areola
Nipple

(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

(c)

(d)

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PAP Smears and Cervical Cancer

- 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