Class 11 Objectives

Upon completion of this lesson, the student will be able to
• compare and contrast the causes of early and delayed puberty.
• identify potential complications of infection and inflammation of the human reproductive system.
• describe the different cancers of the reproductive system.
• explain screening tools used in determining reproductive cancers.
• describe the pathology underlying the common sexually transmitted disease processes.
• identify populations that are at high risk for STDs.
• state preventive measures for STDs.

Early Puberty

Onset
- Age 6 (black females), Age 7 (white females), Age 9 (males)
- 5 times greater in girls than boys
- 74% of female cases are idiopathic

Three forms
- Isosexual: premature development of appropriate characteristics
- Heterosexual: child develops secondary sex characteristics of the opposite sex (evident at time of birth)
- Incomplete: partial development of appropriate secondary sex characteristics (majority are obese)

Causes:
- Idiopathic (including familial), CNS abnormalities (tumors, trauma, hypothyroidism, infectious condition), congenital anomalies
Delayed Puberty

- **Signs**
  - **Females:** Absence of menarche within 5 years of thelarche or by 16 years of age.
  - **Males:** No signs of secondary sex characteristics by age 14.
  - More commonly seen in males vs. females.

- **Causes**
  - Turner or Klinefelter syndrome?
  - Bilateral gonadal failure
  - Idiopathic: empty-scrotum or vanishing-testes syndrome
  - Autoimmune
  - Reversible: Marijuana use, severe obesity, anorexia, strenuous exercise
  - Irreversible: hypopituitarism, congenital CNS defects, malignant pituitary tumors, GnRH deficiency

Amenorrhea

- Absence of menstruation in a female of reproductive age
  - **Primary:** lack of menarche by age 14 w/o secondary sex characteristics; or 16 regardless of secondary sex characteristics
    - Congenital defects of gonadotropin production
    - Genetic disorders
    - Congenital CNS defects
    - Congenital anatomic malformations of reproductive system
  - **Secondary:** absence of menstruation for 3 or more cycles or 6 months in women who have previously menstruated
    - Disease, dramatic weight loss, head injury or tumor

- **S & S**
  - No menses, hirsutism, acne, vaginal atrophy, infertility, vasomotor flushes

Pelvic Inflammatory Disease (PID)

- A polymicrobial infection of mixed strains of bacteria and mycoplasma
  - Ascends from the infected cervix and can involve the uterus, fallopian tubes, or ovaries, and whole peritoneum (very serious)
  - Release of cytokines and eventual scarring occurs

- **S & S**
  - Sudden, severe abdominal pain with fever or no S & S
  - 1st sign of ascending infection is lower dull abdominal pain
  - May have more pain upon walking, jumping, and/or intercourse
  - Dysuria and irregular vaginal bleeding may be present
Other Inflammations and Infections

- **Vaginitis**: caused by sexually transmitted pathogens and *Candida albicans*
  - High incidence in the 10-24 year-old range
  - Predisposition is caused by changing the acidic pH of vagina
    - Douching, feminine products, glycogen

- **Cervicitis**: inflammation of the cervix
  - Mucopurulent cervicitis: caused by one or more ST pathogens, *Trichomonas, gonorrhea, Chlamydia, Mycoplasma, Ureaplasma*
  - Oral antibiotic treatment for sexual partners

Cervical Cancer

- A malignant neoplasm of the cervix
  - Considered a STD
  - Risk: early age intercourse; multiple partners
  - Improved detection with Papinolcaou (PAP) smear
  - HPV is linked with cervical cancer incidence
  - Implemented as an AIDS defining diagnosis
  - Less related factors: unincircumcised male partners; use of oral contraceptives; parity; family hx
  - Early detection: treat with cryotherapy, conization, or laser
  - Hysterectomy for more advanced cancer
  - S&S: bleeding, discharge, foul odor

Ovarian Cancer

- Malignant neoplasm originating from ovarian surface cells
  - unknown etiology: r/t a strong family history
  - Two major types: epithelial and germ-cell neoplasms

- **S & S: Silent disease**
  - vague abdominal pain; a possible palpable mass; distention; abnormal uterine bleeding; urinary tract obstruction; altered bowel habits
  - serum testing for CA-125 (a tumor marker)

- **Treatment**
  - Total abdominal hysterectomy (TAH); resection; chemotherapy
Vaginal Cancer

- A rare occurring cancer of the female reproductive system (0.2%).
  - 75-85% are squamous cell-type cancers
  - Mean age of invasive type = 55 years
  - Associated with HPV infection & sexual activity
  - Exposure to DES (nonsteroidal estrogen) in utero?
  - Classified as: Dysplasia, carcinoma in situ, or invasive carcinoma
    » See McCance, Table 22-4 (p. 729)

- Treatment
  - Upper vaginectomy, laser ablation, chemotherapy, hysterectomy

Fibrocystic Changes of the Breast

- Includes benign breast changes:
  - Cyst formation: form within lobular or subareola areas
  - Ductal hyperplasia: dilation of the ductal system
  - Fibrosis: may result as an inflammatory response to cysts

- Occurs in 10% of women < 21 years old

- Clinical manifestations:
  - Breast pain (“mastalgia”) is most common 4-7 days into the luteal phase of the cycle
  - Tender firm masses in the upper outer quadrant
  - Evaluation: breast biopsy, mammography, sonography
  - Treatment: relieve symptoms, drain cysts, Danazol

Breast Cancer

- A malignant neoplasm arising from one of several tissue types within the breast
  - Most common cancer in females
  - Leading cause of death for females 40-44 years of age
  - An > incidence n't improved screening & aging population
  - Rare in those younger than age 25

- Risk factors: see McCance (Table 22-13, p. 763)
  - Hormones, genetics, early menarche, late menopause, HRT
  - Race, Nullip or late first child, obesity, ETOH abuse
Breast Cancer

- BRCA1 gene confers > risk of breast cancer
  - BRCA1 gene is autosomal dominant
    - Women with BRCA1 gene have an 85% lifetime risk of developing breast cancer
    - BRCA1 gene is present in 30% of women who develop breast cancer before age 45

Clinical manifestations:
- Ductal cancer may not present as a mass, but as bloody discharge from the nipple on the affected side
- Unilateral edema (orange peel texture) of overlying skin; fixation of breast with position change; retraction of the nipple
- Bone metastasis is painful; pathological fractures?

Prevention: BSE & Mammography
Tx: depends on tumor stage; Age; tx preference
Stage 1 & 2: breast conserving surgery (e.g. lumpectomy) followed by radiation (plus Tamoxifen or chemo for + nodes)
See McCance, Box 22-18 (p. 772) for staging of breast cancer

Male Breast Disorders

- Gynecomastia
  - Overdevelopment of breast tissue in a male
  - Evaluation: physical exam
  - It accounts for 85% of the masses that develop
    - Watch out for unilateral; evaluate for malignancy
    - Adolescence and men > 50
    - Estrogen therapy
      - Sex-change operation or for prostatic carcinoma
Testicular Torsion

- An acute ischemic injury of the testis due to its rotation around the vascular pedicle of the spermatic cord
- Epidemiology: 1:160 males
  - at risk: neonates & adolescents
- Etiology:
  - Neonates: maldeveloped tunica vaginalis membrane
  - Puberty: incomplete attachment of the testis & spermatic fascia to the scrotal wall
  - Diagnostic testing: urinalysis, color Doppler ultrasonography
  - Surgical emergency
    - Untwisting of spermatic cord & anchor both testes in the scrotum

Testicular Torsion

- Pathophysiology:
  - Twisting of spermatic cord leads to venous occlusion & results in ischemia
  - Irreversible damage in hours (medical emergency)
- S&S:
  - Acute onset of pain; N & V; edema, ecchymosis & elevated affected side
  - Twisted cord may be actually palpated
- Treatment
  - Manual detorsion before surgery
  - Surgical fixation = orchiopexy
  - Nonviable testes = orchiectomy

Testicular Cancer

- Malignant neoplasms of testicular tissue or germ cells
- Epidemiology: 1% of all male cancers
  - Leading cause of death due to illness in males (15-35 yrs.)
  - > incidence in white males (4 times > than AA)
- Etiology: unknown
- Pathophysiology: 90% rise from germ cells
  - Least malignant form is the seminoma
- Symptoms: painless small nodule in the front or on the side of the scrotum
- Evaluation
  - Physical exam, ultrasonography, tumor markers
**Testicular Cancer**

- Prevention & Treatment:
  - Early detection: self-examination
  - Orchiectomy: surgical removal of testis
  - Chemotherapy or radiation therapy
  - Seminomas are very responsive to radiation tx
  - More than 95% cure rate for seminomas limited to the testes

**Benign Prostatic Hypertrophy**

- A nonmalignant enlarged prostate gland d/t excessive growth of glandular prostatic tissue
  - directly related to age (50% incidence of men > 50 years)
  - hypothesized to be an age-related imbalance in androgenic stimulation of the gland
  - prostatic enlargement compresses bladder neck & obstructs the urine flow
- S & S: hesitancy & intermittency of voiding; straining to void; "dribbling" of urine
- Or an > sympathetic stimulation of smooth muscle of urethra & bladder neck
- S & S: urgency to void, incomplete emptying; overflow incontinence

**Prostatic Cancer**

- A malignant neoplasm of the prostate gland
  - Most common cancer in nonsmoking men
  - Second leading cause of cancer death in men
  - African American have the highest mortality rate
  - 80% of cases are > 65 years old
  - > in money has been recently ear marked for prostate cancer research ($420 million in 2003)

- Detection
  - Digital Rectal Exam: limited in its ability to detect cancer
  - Prostatic-Specific Antigen: a blood test measuring PSA enzymes
Sexually Transmitted Diseases

**Gonorrhea**
- Caused by gonococci (*Neisseria gonorrhoeae*)
- Female: 50-80% chance of development from an infected male partner
- Male: 20-30% chance of development from an infected female partner
- **S & S**
  - Purulent drainage from a Bartholin gland in a female
  - Urethritis and dysuria in males
- **Treatment**
  - Two resistant strains have been identified
  - PPNG & TRNG
  - See McCance Box 23-1, p. 785 for CDC treatment recommendations

**Syphilis**
- Local and systemic manifestations are presented
- Facilitates the transmission of HIV
- **Four stages**
  1) Local invasion
  2) Blood borne to all major organs
  3) Silent: no clinical symptoms
  4) Heart, brain, and bone deterioration
- SeeMcCance Figure 23-3, p. 786, 787

**Chlamydial infections**
- Gram negative: *C. trachomatis* bacterium
- Lacks the ability to reproduce independently
- Leading cause of preventable infertility & ectopic pregnancy
- Most common STI in the US: affects 3 million annually
- 75% of infected women are asymptomatic

**Genital herpes**
- Transmission: intimate contact
- Vesicle formation at the site: painful
- HSV 1 and 2 cannot be distinguished by appearance
- HSV 2 is associated with recurrent infections
- Newborns: can > risk of seizures with a mortality rate of 50%
References

- http://www.minervation.com/cancer/breast/professional/pathophysiology/