Infertility

- Infertility or sterility may be caused by conditions in the male, the female or by combined male/female factors.
- Frequency of each is about equal.
- Male problems include:
  - Changes in sperm or semen.
  - Hormonal abnormalities.
  - Physical obstruction of sperm passage.

Congenital Abnormalities of the Penis

- Epispadias is a urethral opening on the dorsal surface of the penis.
  - If the defect extends to the urethral sphincter, may cause incontinence.
  - Exstrophy of the bladder is more severe case of epispadias.
  - Infections are also common.
Hypospadias is a urethral opening on the ventral surface of the penis. In the most severe cases, the opening is at the proximal end of the penis; may also have chordee. Cryptorchidism is also associated with this condition. Surgical reconstruction may provide normal urinary flow and normal sexual function.

Hypospadias

Cryptorchidism

This represents a maldescent of the testis into the scrotum; testis may:
- Remain in the abdominal cavity
- Remain in the inguinal canal
- Remain above the scrotum

Causes may be:
- Hormonal abnormalities
- Short spermatic cord
- Small inguinal ring
If the testis remains undescended, the seminiferous tubules degenerate and sterility will result. There is also an increased risk of testicular cancer. Surgical positioning of the testes before age 2 is advised.

**Hydrocele, Spermatocele and Varicocele**

- Hydrocele occurs when excessive fluid collects in the potential space between layers of the tunica vaginalis.
  - May occur as a congenital defect.
  - Acquired hydrocele may result from a scrotal injury, infection, tumor or unknown cause; more common after middle age.
- Large amounts of fluid may compromise the blood supply to the testes.

**Spermatocele**

- This is a testicular cyst containing fluid and sperm that forms between the anterior end of the epididymis and the testis.
- If large it may be surgically removed.
Varicocele

- This is a dilated vein in the spermatic cord, usually on the left side
- Frequently develops at puberty and results from lack of valves in the veins allowing back flow of blood
- May be painful or tender and may lead to infertility because of the impaired blood flow to the testes

Benign Prostatic Hyperplasia

- Very common disorder in older men
  - Varies from mild to severe
  - Is actually hyperplasia of prostatic tissue with the formation of nodules surrounding the urethra
  - This generally leads to compression of the urethra and variable degrees of urinary obstruction
  - Appears to be the result of an imbalance between estrogen and testosterone associated with aging
  - No known connection between BPH and prostatic cancer

[Diagram of Benign Prostatic Hyperplasia]
Cancer of the Prostate

- Common in men over age 50 and ranks high as a cause of death from cancer
  - Most common cancer in older men
  - Third leading cause of death from cancer
- Most prostate cancers are adenocarcinomas arising from tissues near the surface of the gland (rather than deeper tissues as in BPH)
- Two serum markers, PSA and prostatic acid phosphatase are helpful in early detection

Tumors vary in the degree of cellular differentiation
- The less differentiated or anaplastic the tumor, the faster it grows and spreads
- Many are androgen dependent
- Metastasis to bone occurs relatively early and involves, spine, pelvis, ribs and femur

In most cases, the cancer has spread before diagnosis
- May spread to:
  - Pelvic lymph nodes
  - Liver
  - Adrenal glands
  - Lungs
- Cause has not been determined but genetic and environmental factors as well as hormonal levels appear to be involved
Prostatic cancer is common in North America and northern Europe but not Far East. Lower fat in diet of people in the Orient, more soy products seems to be an important factor in reducing prostatic cancer.

Testicular Cancer
- The majority of tumors of the testes are malignant.
- Typically arise from the germ cells of the seminiferous tubules.
- Not a common cancer but occurs in younger men, primarily 15-35 age group.
- Etiology:
  - Familial incidence
  - May result from infection or trauma
  - Most important predisposing factor is cryptorchidism

Female Infertility
- May be associated with hormonal imbalances:
  - Hypothalamic RH’s and IH’s
  - Anterior pituitary gland
  - Ovaries
- Structural abnormalities
- Obstructions in oviducts
- Access of viable sperm may be reduced
- Recent studies show cigarette smoking by either partner may deter pregnancy
Menstrual Abnormalities

- Amenorrhea (lack of menstruation)
  - Primary (menarche never occurred)
    - Genetic, e.g., Turner’s Syndrome
    - Congenital defects affecting the hypothalamus, CNS, pituitary or congenital absence of a uterus
  - Secondary (loss of menstruation)
    - Problems with the hypothalamic-pituitary axis
    - Hypothalamic suppression from tumor, stress, sudden weight loss, eating disorders, participation in competitive sports (leading to reduced body fat); anemia or chemotherapy

- Dysmenorrhea (painful menstruation)
  - Primary: has no organic foundation and develops when ovulation commences
  - Secondary: results from pelvic disorders such as endometriosis, uterine polyps, tumors or pelvic inflammatory disease
  - Dysmenorrhea is a condition where pain is sufficient to interrupt normal activities
  - The severe cramping pain is related to excessive release of prostaglandin (PGF$_{2\alpha}$) during endometrial shedding

Endometriosis

- This is the presence of endometrial tissue outside the uterus on structures such as the ovaries, ligaments or colon
- The ectopic endometrium responds to cyclic hormone variations, forming blood filled “chocolate cysts”
- The cause of endometriosis is not known
Pelvic Inflammatory Disease

- PID is an infection of the reproductive tract, particularly the oviducts and ovaries
- Condition includes cervix, uterus, oviducts and ovaries
- May be acute or chronic
- Complications include peritonitis and pelvic abscess as well as long term infertility and a high risk of ectopic pregnancy

Benign Tumors

- Leiomyoma (Fibroids) are benign tumors of the myometrium (cause unknown)
- Common during reproductive years and tend to shrink after menopause
- Classified by location:
  - Intramural - developing in the uterine wall
  - Submucosal - beneath the endometrium
  - Subserosal - under the serosa
- Last two types may develop as polyps
Fibroids usually occur as multiple well-defined but unencapsulated masses.
They vary in size; large fibroids degenerate inside, undergo necrosis and become cysts.
They are hormone dependent, growing rapidly during pregnancy and decreasing in size and becoming more fibrous after menopause.
Often associated with heavy bleeding during menstruation (menorrhagia).

Ovarian Cysts
- Ovarian cysts may develop unilaterally in either a follicle or corpus luteum.
- Usually multiple, small fluid-filled sacs.
- Sometimes grow very large; risk of torsion of the ovary.
- Bleeding can cause inflammation.
Ovarian Cancer

- About 25,000 women are diagnosed with ovarian cancer each year in U.S.
- Usually it is diagnosed in advanced stage when it has spread to other organs
- About 16,000 women die each year from the disease.
- Recent research has found changes in four protein biomarkers in the blood that may prove significant in detecting ovarian cancer in its earliest stages.

Fibrocystic Breast Disease

- Also called benign breast disease
- Fibrocystic disease refers to the presence of nodules or masses in the breast tissue that change during the menstrual cycle
- Connective tissue is gradually replaced by dense fibrous tissue.
- Cysts fill with fluid during the proliferative phase of the cycle and gradually enlarge over time
Three categories of lesions have been designated according to the risk of developing into breast cancer:
- Category I: nonproliferative lesions which include microcysts and fibroadenomas; they are single, movable, benign masses
- Category II: proliferative lesions in which there are NO atypical cells; some risk if there is a family history of breast cancer
- Category III: proliferative lesions WITH atypical cells; requires monitoring especially where there is a family history of breast cancer

Breast Cancer
- Malignant tumors develop in the upper outer quadrant of the breast in about half the cases; central portion of breast is next most common site
- Most tumors are unilateral
- Are several types of breast cancers
- Those arising from the duct epithelium are most common
- Malignant cells spread at an early stage, first to nearby lymph nodes

- In most cases, several lymph nodes are affected at the time of diagnosis
- Widespread dissemination follows quickly, including metastases to the lung, brain, bone and liver
- Carcinoma of the breast is a common malignancy in women with the risk increasing after age 20
- More women are developing breast cancer and at a younger age
Cervical Cancer

- The number of deaths has declined with increased use of the Pap test for screening and early diagnosis while the cancer is still in situ.
- HOWEVER, the number of cases of in situ cervical cancer has increased in U.S.
- This cancer is strongly linked to oncogenic sexually transmitted diseases such as herpes simplex virus type 2 (HSV-2) and human papillomavirus (HPV).
- High risk factors for cervical carcinoma include all risk activities for STD's.