Male Reproductive System

**TESTES** and **EPIDIDYMIS**
- Testes produce male gametes (SPERMATOZOA) and male sex hormone – **TESTOSTERONE**
- Found in pouch of skin called a **SCROTUM**
- Size of a small egg
- Made up of 250 lobules, each with coiled **SEMINIFEROUS TUBULES** – where sperm develop
- They join to form the **EPIDIDYMIS** where sperm are stored – they join at the ductus deferens **VAS DEFERENS**
Descent of the Testes

- In embryo, testes formed in the abdomen
- During last 3 months, migrate into scrotum
- **CRYPTORCHIDISM** – when testes don’t descend
- Rx – surgical procedure before puberty

**SCROTUM** – sac of skin that contains testes

**VAS DEFERENS**

- Runs from epididymis to ejaculatory duct
- **SEMINAL VESICLES** connect to vas deferens, secretions nourish sperm
- **EJACULATORY DUCT** – connect vas deferens with urethra

**PENIS**

- Contains erectile tissue
- End of penis covered by loose fitting skin – **FORESKIN**
- Foreskin removed during **CIRCUMCISION**
PROSTATE GLAND
- Surrounds beginning of urethra
- Size and shape of a chestnut
- Secretes a fluid that enhances sperm motility

BULBOURETHRAL GLANDS
- Located on either side of prostate below prostate
- Add alkaline secretion to semen that helps sperm live longer

ERECITION AND EJACULATION
- Urethra has dual role – excretion of urine and to expel semen
- Erection caused when erectile tissue fills with blood
- Ejaculation expels semen
- IMPOTENCE – unable to copulate

INFERTILITY
- When contraception does not occur – caused by damage to fallopian tubes, low sperm count, hormone imbalance, other disorders
Female Reproductive System

OVARIES

- primary sex organs of the female
- in lower part of abdominal cavity
- about the size of an almond
- 2 functions:
  1. produce ova
  2. manufacture female sex hormones
- Each ovary contains thousands of microscopic sacs – graafian follicles
- A single follicle matures every 28 days – an ovum matures inside – during the reproductive years
- Reproductive ability begins at puberty – when menarche occurs (first menstrual period)
- When the ovum is mature in the follicle, it is released (OVULATION) about 2 weeks before the menstrual period begins
- After ovulation, the ovum travels down the fallopian tube
Fertilization takes place in the fallopian tube, usually within 2 days of ovulation

Following fertilization, the zygote implants in the uterus

Development of follicle controlled by FSH, ovulation caused by LH

Following ovulation, the remaining follicle turns yellow and becomes the corpus luteum, which secretes progesterone

If the egg is fertilized, progesterone continues

If the egg is not fertilized, corpus luteum degenerates and progesterone production stops

**FALLOPIAN TUBES**

- 4” long - not attached to ovaries
- Pregnancy that implants in tube – **ECTOPIC PREGNANCY**
- Smooth muscle and cilia help propel ova into the uterus
UTERUS

- Hollow, thick-walled, pear-shaped, highly muscular organ
- Lies behind the urinary bladder and in front of the rectum
- **FUNDUS** – bulging upper part of the uterus, the body is the middle portion, and the **CERVIX** is the narrow portion that extends into the vagina
- Uterine wall – 3 layers, outer layer is the visceral peritoneum, thick muscle layer is the **MYOMETRIUM**, and the mucous lining is the endometrium

VAGINA

- Smooth muscle with a mucous membrane lining
- Hymen – membrane found near the entrance to the vagina
External Female Genitalia

- **VULVA** – external organs of reproduction
- **MONS PUBIS** – pad of fat that overlies pubic bone
- **CLITORIS** – small structure above the urinary meatus that contains many nerve endings
- **LABIA** – folds of skin that surround the vagina
- **PERINEUM** – area between vagina and rectum
- **EPISIOTOMY** – incision in perineum to make more room for childbirth

**BREASTS (MAMMARY GLANDS)**

- Accessory organs
- **AREOLA** – darkened area that surrounds the nipple
- Prolactin stimulates the mammary glands to secrete milk following childbirth
MENSTRUAL CYCLE

- Occurs every 28 days
- Divided into 4 stages
  1. **Follicle stage** – FSH from pituitary → ovary, stimulates follicle with ovum to mature → releases estrogen and prepares uterine lining, lasts 10 days
  2. **Ovulation stage** – Pituitary stops FSH and releases LH, 14\textsuperscript{th} day – follicle ruptures and mature ovum released
  3. **Corpus luteum stage** – Corpus luteum secretes progesterone. If ovum fertilized, corpus luteum continues secrete progesterone, which prevents further ovulation and maintains uterine lining, lasts 14 days
  4. **Menstruation stage** – If no embryo, corpus luteum dissolves → progesterone ↓ and uterine lining breaks down and is discharged, 3-6 days

MENOPAUSE

- Monthly menstrual cycle comes to an end
- Approximately age 50
- Symptoms include:
  1. hot flashes
  2. dizziness and headaches
  3. emotional changes
Conception and Pregnancy

GERM CELLS (GAMETES) – produced by GONADS
Female gonad = ovary
Female gamete = ova
Male gonad = testes
Male gamete = sperm

Normal cell division is mitosis.
In the formation of germ cells, special process of cell division occurs – called MEIOSIS

Female meiosis is OOGENESIS
Male meiosis is SPERMATOGENESIS

Female gametes have 22 pairs of autosomes and single pair of sex chromosomes – XX

Male gametes have 22 pairs of autosomes and a single pair of sex chromosomes – XY

FERTILIZATION
- During sexual intercourse (COITUS) sperm enter female reproductive tract and live or a day or two
- Approximately 100 million sperm in 1 cc of semen – if count less than 20 million, man is sterile
• Eventually, one sperm penetrates and fertilizes the ovum

• True fertilization occurs when the sperm nucleus combines with the ovum nucleus to form a fertilized egg cell – ZYGOTE

• The zygote has 46 chromosomes

• It divides, and those cells divide, and so on

• Zygote continues to divide as it travels down fallopian tube and is implanted in wall of uterus.

• At 7 days, the zygote becomes an embryo

• At 3 months, it becomes a fetus
Pregnancy = Prenatal period or GESTATION

Normal pregnancy = 40 weeks or 280 days
Also divided into 3 trimesters (3 month periods)

QUICKENING = first recognizable movement of fetus between 4th and 5th month

PARTURITION = the act of giving birth

SPONTANEOUS ABORTION = miscarriage

INDUCED ABORTION = The termination of pregnancy by artificial means
Reproductive Procedures

**ARTIFICIAL INSEMINATION** – semen placed into vaginal canal, usually around time of ovulation

**IN-VITRO FERTILIZATION** – female given ovulation inducing drugs – multiple ovarian follicles develop – laparoscopy performed to remove ova from mature follicles – ova cultured in-vitro with sperm in laboratory- when zygote is 4-8 cells large, it is transferred to the uterus

**LAPAROSCOPY**
- Under anesthesia, abdomen distended with carbon dioxide gas to make organs easier to see
- Tube with a light on it is inserted through tiny incision
- Can remove tissue with laparoscope

**HYSTERECTOMY** – surgical removal of the uterus
**MASTECTOMY** – surgical removal of the breast
**LUMPECTOMY** – surgical removal of a breast lump
**MAMMOGRAM** – breast x-ray to detect tumors, recommended annually for women ↑ 40

**VASECTOMY** – male sterilization, removal of part of the vas deferens
**Female Reproductive Disorders**

**AMENORRHEA**
- absence of menstruation
- normal in pregnant women
- can be caused by hormonal imbalance and other disorders

**PMS (PRE-MENSTRUAL SYNDROME)**
- Group of symptoms prior to menstrual cycle
- Symps: irritability, nervousness, mood swings and weight gain (fluid retention)
- Rx – medication and diet

**DYSMENORRHEA**
- Painful menstruation
- Cramping may be caused by the release of prostaglandins
- Rx – medication

**MASTITIS** – inflammation of the breast, bacteria enter through the nipple, infection begins in one lobule, may spread
ENDOMETRIOSIS

- Endometrial tissue found outside the uterus
- Abnormal patches of the uterine lining
- Results in internal bleeding, inflammation of surrounding areas and formation of scar tissue, dysmenorrhea, infertility, heavy or irregular bleeding
- Cause – unknown

FIBROID TUMORS

- Benign growths in uterine wall
- May enlarge, causing pressure on other organs, or may cause excessive bleeding
- Rx – hysterectomy

BREAST TUMORS

- Can be benign or malignant
- BSE should be done every month
- Suspected lumps should be reported to a Dr.

BREAST CANCER

- Most common cancer in women
- Early detection and treatment vital for survival
- Rx – surgical, chemotherapy and radiation
CERVICAL and uterine CANCER

- Detected by a PAP SMEAR (PAPANICOLAOU) - sample of cell scrapings taken for microscopic study
- Should be done annually
- Rx – early detection, hysterectomy, chemotherapy and radiation

PID (PELVIC INFLAMMATORY DISEASE)

- Infection in reproductive organs which spreads to the fallopian tube and abdominal cavity
- Pain, fever, possible scarring of fallopian tubes
- Rx – antibiotics and analgesics

TOXIC SHOCK SYNDROME

- Bacterial infection caused by staphylococcus
- Symps – fever, rash, hypotension
- Cause – use of tampons
- Rx – antibiotics

VAGINAL YEAST INFECTIONS

- Caused by candida albicans
- Develops when the vagina becomes less acid
- Symps – itching, burning, LEUKORRHEA
- Rx – antifungal medication
**Male Reproductive Disorders**

**EPIDIDYMITIS**
- Painful swelling in groin and scrotum due to infection of epididymis
- Rx – antibiotics

**ORCHITIS**
- Inflammation of testes
- May be a complication of mumps, flu or other infection
- Symps – swelling of scrotum, fever and pain
- Rx – antibiotics, analgesics, cold compresses

**PROSTATITIS**
- Infection of prostate gland
- Urinary symptoms are first indication – difficult urination
- Rx – antibiotics
BPH (BENIGN PROSTATIC HYPERTROPHY)
- Enlarged prostate
- More than half of men in their sixties and 90% of men in their seventies have some symptoms
- Prostate enlarges but capsule does not, causing prostate to clamp down on urethra.
- This causes the bladder to become irritable, causing urinary frequency
- Diagnosis by rectal exam, ultrasound, and cystoscopy
- Rx – usually prostatectomy – laser surgery, sometimes no Rx

PROSTATE CANCER
- Most common Ca in males over 50
- Can be detected by a blood test
- Symps – frequency, dysuria, urgency, nocturia, and sometimes hematuria
- Rx – PROSTATECTOMY
Sexually Transmitted Diseases

- **STDs or Venereal disease**
- Transmitted via body fluids
- Can be serious, painful, and cause long term complications including sterility, chronic infection, scarring of the fallopian tubes, ectopic pregnancy, cancer and death
- Some STDs have no symptoms
  1. females – discharge, pelvic pain, burning or itching, unusual bleeding, vaginal pain during intercourse
  2. males – discharge from penis
  3. both genders – sores or blisters near mouth or genitalia, burning and pain during elimination, flu-like symptoms, swelling in groin area
- 100% Protection – abstinence
- Condoms may provide some protection
- Once a person is aware he/she has a STD, all current and past sexual partners must be notified and treated
CHLAMYDIA

- Caused by Chlamydia Trachomatous organism
- Most common curable STD in US
- Up to 80% of women and 25% of men have no symptoms
- Rx – antibiotics

GENITAL WARTS

- Human papillomavirus
- Wart is usually symptomatic, often not visible to the naked eye
- May look like small, hard, round spots resembling a cauliflower
- Diagnosis by examination
- Rx – acid or cryosurgery (liquid nitrogen)

GONORRHEA

- Bacterial infection caused by Neisseria gonorrhoea
- Symps in male – painful urination and discharge
- Symps in female – none
- Rx – antibiotics
- Complications if untreated – can lead to sterility
GENITAL HERPES

- Viral
- Burning sensation with small blisters on genitalia
- Symptoms disappear after 2 weeks but will continue to reappear throughout the lifetime of the individual
- Females – may need a c-section to prevent infection of newborn during childbirth

SYphilIS

- Bacterial infection
- First stage – chancre sore at site of infection
- 2nd stage (6-12 weeks after infection) – discolored spots or patches on hands and soles of feet, skin lesions, mucous patches in mouth, throat and cervix, rash over body, flu-like symptoms
- In final stage (10-40 years after infection) liver damage, heart disease, brain damage, paralysis and death
- Diagnosis – exam of lesion under microscope and blood test
- Rx – Penicillin
Contraception

Methods of preventing pregnancy and in some instances, some degree of protection against STDs. Understanding required for practice as a health care worker.

<table>
<thead>
<tr>
<th>Method</th>
<th>Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstinence</td>
<td>100%</td>
</tr>
<tr>
<td>Sterilization</td>
<td>100%</td>
</tr>
<tr>
<td>Birth Control pills</td>
<td>95-99%</td>
</tr>
<tr>
<td>IUD</td>
<td>93-99%</td>
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<tr>
<td>Diaphragm</td>
<td>90-99%</td>
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<tr>
<td>Condom</td>
<td>85-97%</td>
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<tr>
<td>Spermacides, Douching, Withdrawl and Rhythm</td>
<td>???-85%</td>
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Sterilization
Male – VASECTOMY (Vas Deferens)
Female – TUBAL LIGATION (Fallopian Tube)