NOTES - CH 16 part 1:
Male Reproductive System

Male reproductive system
Functions of the Reproductive System

1) PRODUCE SEX CELLS
2) PRODUCE SEX HORMONES
3) SUSTAIN and/or TRANSPORT SEX CELLS
Gamete Production

• Body cells have 2 sets of genetic instructions
  – Carried on 46 chromosomes

• Sex cells have 1 set of genetic instructions
  – Carried on 23 chromosomes
Gamete Production

- Sperm and **oocytes** (eggs) are produced through meiosis
Products of Meiosis

• In males
  – $4$ sperm of equal size are created
  – Production of sperm begins during puberty and continues through entire life
Products of Meiosis

- In females
  - 1 large egg is produced
  - 3 smaller eggs died off
  - Born with all the eggs she will ever need (all in Prophase I)
  - During puberty, 1 egg will be released and will then finish meiosis egg production ends at menopause (more on this later)
PRIMARY ORGANS OF THE MALE REPRODUCTIVE SYSTEM:

- **TESTES**
  - contain the highly coiled **SEMINIFEROUS TUBULES**
  - epithelial cells of the seminiferous tubules produce sperm cells
  - interstitial cells (**LEYDIG CELLS**) produce sex hormones
  - a **SPERM CELL** consists of:
    - a head, midpiece, and tail
**Internal Accessory Organs:**

**EPIDIDYMIS:**
- coiled tube (6 m long!) that leads from the seminiferous tubules to the vas deferens
- stores and nourishes immature sperm cells and promotes their maturation
- sperm cells here for approx. 20 days
VAS DEFERENS:

- muscular tube
- leads from the epididymis to behind the urinary bladder
- it fuses with the duct from the SEMINAL VESICLE to form the EJACULATORY DUCT
SEMINAL VESICLES:
- produce 60% of semen volume/fluid
- secretes alkaline fluid that:
  a. helps regulate pH once sperm travel outside
  b. contains nutrients (i.e. fructose) for energy
  c. contains prostaglandins which stimulates muscular contractions in female reproductive organs to help move sperm towards egg
PROSTATE GLAND:
• about 4 cm wide and 3 cm thick and surrounds the urethra just inferior to the urinary bladder
• secretes a thin, milky fluid that neutralizes the pH of the semen and the acidic secretions of the vagina
BULBOURETHRAL GLANDS
(a.k.a. “Cowper’s gland”):

● 2 small structures inferior to the prostate gland

● secrete a fluid prior to ejaculation that lubricates the penis in preparation for intercourse

● this secretion may contain sperm cells

URETHRA

● tube that drains both repro. & excretory products
SEMEN

- consists of: sperm cells and secretions from the seminal vesicles, prostate gland, bulbourethral glands
- slightly alkaline fluid
- contains nutrients (fructose) and prostaglandins
SEMEN

- typical semen production = \(2\text{-}5\ mL\), about 120 million sperm per mL

- semen first coagulates; then thins & sperm begin to swim through the female reproductive tract...
● Sperm can live up to 6 days once expelled from body.
● Its ability to fertilize an egg only lasts 24-48 hours once it enters female’s body.
● Sperm can be stored and kept viable if stored at -100°C for years.

*in vitro* fertilization
External Reproductive Organs:

**SCROTUM:**
- a pouch of skin that encloses the testes for protection and temperature regulation
PENIS:

- 3 cylinders of erectile tissue (when filled with blood, penis becomes erect);
  - corpus cavernosa: pair of hollow tubes on either side
  - corpus spongiosum: surrounds the urethra
• head of penis = glans penis; has thinner covering; is covered by a prepuce (foreskin)

• Circumcision = when the prepuce has been removed
Sexual Response:

Two types of physiological reactions predominate in both sexes during sexual arousal/response:

• **Vasocongestion**: filling of a tissue with blood

• **Myotonia**: increased muscle tension
Sexual Response in MALES:

- during erection, vascular spaces in erectile tissue fill with blood → erection
- culmination of sexual stimulation = orgasm
- orgasm includes:
  1) EMISSION: sperm cells moving from testes and mixing with secretions to make semen
  2) EJACULATION: peristalsis moves semen to out of body through urethra
Hormones Involved in Reproduction - MALES

- **Androgens**: produced in Leydig cells in testes (i.e. **TESTOSTERONE**)

- **GnRH**: from hypothalamus; stimulates pituitary to release FSH and LH

- **FSH**: acts on seminiferous tubules to increase sperm production

- **LH**: stimulates androgen production
*primary sex characteristics:*

- development of internal and external reproductive organs

- sperm production

![Diagram of sperm and reproductive organs with labels: Sperm, Midpiece, Head, Tail.](image)

**DOCTOR FUN**

Ejaculation Drill Today

Sperm School
secondary sex characteristics:
- deepening of voice
- distribution of facial & pubic hair
- muscle growth

Sketch of larynx frontal view