Reproductive system

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Male Reproductive Tract
Male reproductive system

- **Gonads = testes**
  - primary organ responsible for sperm production
  - development/maintenance of secondary sex characteristics

- **Gametes = sperm**
Male reproductive system
Structure of testes

• Tunica albuginea

• Seminiferous tubules
  - highly coiled
  - sealed by the blood testis barrier
  - Site of sperm production

• located in testicular lobules
Sertoli cells

- Nursing cells or sustentacular cells
  - form the blood testis barrier
  - support sperm development
Development of sperm

• Sperm formed by two processes
  - meiosis
    • Cell division resulting in genetically varied cells with only one complete set of DNA (remember...our cells have two complete sets!)
  - spermiogenesis
    • morphological changes as sperm develop in tubule system
Seminiferous tubules
Structure of sperm
Leydig Cells

- Interstitial endocrinocytes
- Located between seminiferous tubules
- Secrete testosterone
The long and winding road...

- Seminiferous tubules → rete testis → epididymis → vas deferens → ejaculatory duct → prostatic urethra → membranous urethra → penile urethra
Epididymis

- Sperm “swim school”
- comma shaped organ that arches over the posterior and lateral side of the testis
- stores spermatozoa until ejaculation or absorption
Vas Deferens

- extends from the epididymis
- passes posterior to the urinary bladder
- meets the spermatic blood vessels to become the spermatic cord
- passes into the seminal vesicles to form the ejaculatory duct
Seminal Vesicles

- Bilateral
- on the posterior/inferior aspect of the urinary bladder
- produce 60% of semen
Prostate gland

- located inferior to the urinary bladder
- surrounds the prostatic urethra
- size and shape of a chestnut
- secretes about 1/3 of semen
Bulbourethral (Cowper's) Gland

- located inferior to the prostate and superior to the penis
- secretes an alkaline substance prior to ejaculation
- neutralizes acid from urine
Penis

- cavernous erectile tissue that becomes engorged with blood during erection
  - corpus spongiosum: surrounds the penile urethra
  - corpora cavernosa: 2, located on the dorsal aspect of the penis
Penis

- **Glans**
  - enlarged tip of the penis

- **Prepuce**
  - cuff of loose skin that covers the glans
  - removed during circumcision
scrotum

- a thin sac of skin, superficial fascia and smooth muscle (dartos)
- holds the testes outside of the body
- reduced temperature aids in development of sperm
cremaster muscle

- skeletal muscle fibers extending from the internal oblique muscle
- responsible for elevating the testis
**tunica of the testis**

- **tunica vaginalis**
  - outpouching of the peritoneal cavity
  - a serous sac
- **tunica albuginea**
  - the fibrous capsule of the testes
Female reproductive tract
Female reproductive system

- **Gonads** = ovaries
  - almond shaped
  - flank the uterus on either side
  - within the peritoneal cavity
  - attached to the uterus and body wall by ligaments

- **Gametes** = oocytes
  - released from the ovary during ovulation
  - Develop within ovarian follicles
ovarian follicles

- layers of epithelial cells surrounding ova
- Primordial follicle
  - most immature of follicles
- Primary follicle
  - single layer of follicular (granulosa) cells
- Secondary
  - more than one layer and growing cavities
- Graafian
  - Fluid filled antrum
  - ovum supported by many layers of follicular cells
  - Ovum surrounded by corona radiata
corpus luteum

- Ovulation releases the oocyte with the corona radiata
- Leaves behind the rest of the Graafian follicle
- Follicle becomes corpus luteum
- Continues to secrete hormones to support possible pregnancy until placenta becomes secretory or no implantation
- Becomes corpus albicans when no longer functional
Uterine (Fallopian) Tubes

- ciliated tubes allowing for passage of the ovum to the uterus and sperm toward the ovum
- fertilization should occur within 1st third from the ovary
- fimbriae
  - finger like projections that cover the ovary and sway, drawing the ovum inside after ovulation
Histology of uterine tubes

- Four regions
  - Fimbriae
  - Ampulla
  - Isthmus
  - Intramural region

- Three layers
  - Mucosa
  - Muscularis
  - Serosa

- Mucosa has longitudinal folds

- Simple columnar epithelium
  - Peg cells = provide nutrition to sperm and aid in capacitation
  - Ciliated cells = beat in unison
Uterus

- a muscular, hollow organ
  - supports the embryo/fetus during pregnancy

- Three layers
  - Endometrium
    - inner lining of columnar epithelium
    - highly modified during pregnancy
  - Myometrium
    - smooth muscle layer
  - Perimetrium
    - adventititia of the uterus
Uterine ligaments

- **broad**
  - spans the width of the uterus
- **round**
  - perpendicular to the broad ligament
Regions of uterus

- **Fundus**
  - superior most area
- **Body**
  - longest part of the uterus
- **Cervix**
  - necklike region of the uterus that extends into the vagina
  - internal and external os are the openings of the cervix
Histology of the uterus
Vagina

• birth canal
  - thin walled expandable tube
  - posterior to the urethra and anterior to the rectum
  - folded with rugae

• hymen
  - vascular covering to the vagina
Histology of vagina
External Genitalia

• Labia
  - folds that protect the vestibule
    • major
      - dry skin with hair
    • minor
      - moist mucus membrane

• clitoris
  - homolog to the penis
    • contains erectile tissue, a glans, body and prepuce

• Perineum
  - diamond shaped region containing the urethral orifice, external genitalia, and anus.