

PELVIS & PELVIC CAVITY:

Pelvic cavity (*pelvis* - L.: *basin*)

1. simple continuation of abdominal cavity
2. **pelvic girdle**
 - a. ring of bone: ilium, ischium, pubis, sacrum, coccyx
 - b. anterior wall - pubis, pubic symphysis
 - c. posterior wall - sacrum, coccyx
3. **ligaments** - complex arrangement
 - a. pubic symphysis is fibrocartilage
 - b. sacroiliac (sacrum + ilium) joint is synovial
4. **false pelvis**
 - a. space above pubic brim
 - b. bowel, full bladder, pregnant uterus
5. **true pelvis**
 - a. space below pubic brim
 - b. muscular floor = pelvic diaphragm
 - c. contents = colon/rectum, bladder, vagina/uterus
6. **perineum**: surface external to (below) pelvic diaphragm
 - location of external genitalia

Pelvic diaphragm - muscular floor of pelvis

1. composed of many layers of complicated muscles
2. supports pelvic organs:
 - colon, rectum, bladder, prostate, vagina, uterus
3. contains & stabilizes GI/UG external sphincters
 - a. urethra - external urethral sphincter = urination
 - b. anus - external anal sphincter = defecation
 - c. vaginal sphincter + ext. urethral sphincter
 - easily injured @ childbirth
 - reconstruction is critical
4. prolapse of pelvic contents:
 - a. rectum - occurs in both men & women
 - b. uterus - associated with multiple child-births
5. perineum (*Gr.: around + excrete*)
 - a. bounded by pelvic floor above, fat and skin below
 - b. location of external genitalia

Kegels - @ Dr. Arnold Kegel

1. contract pelvic floor m.s = retaining bowel movement
2. contraction brought anteriorly = retaining urine
3. together, exercises tone pelvic floor muscles:
 - a. relieves urinary difficulties
 - b. eases birthing process & recovery

Pelvic vessels

1. **external iliac arteries** - do not enter pelvis
2. **internal iliac arteries** - branch erratically
 - a. visceral branches to pelvic viscera
 - bladder, uterine/vaginal, rectal a.s.
 - b. internal pudendal arteries
 - hemotumescent structures & associated muscles
3. **gonadal arteries**
 - a. testicular/ovarian arteries (aortic branches)
 - b. dragged into pelvis by their respective gonads
4. **hemorrhoids**
 - a. varices (dilations) of the rectal veins
 - b. formed after prolonged pressure on the rectal walls
 - pregnancy, constipation, straining during micturation
 - reading the entire "Sunday paper" on the toilet
 - d. drying/abrasion of these vessels causes:
 - considerable pain, itching, hemorrhage, infection.

Pelvic nerves

1. **Pelvic parasympathetics**
 - a. S₂₃₄ (pudendal nerve - *L.: to be ashamed*)
 - b. causes dilation of blood vessels in erectile tissues
 - c. sensory nerve to skin of perineum & external genitalia
2. **Sacral sympathetics**
 - a. initiate ejaculation - contraction seminal vesicles
 - b. contracts muscles of trigone - prevents sperm reflux
 - c. reflexive contraction of muscles in the pelvic floor
 - a.k.a. - male/female orgasm

REPRODUCTIVE SYSTEM

Sexual reproduction requires:

1. **meiosis**: formation of haploid cells (gametes)
 - a. male gonads: testis - spermatogenesis
 - b. female gonads: ovaries - oogenesis
2. **fertilization**:
 - a. re-combination of haploid cells > diploid *conceptus*
 - b. mammals = internal fertilization (protects *conceptus*)
 - c. requires introduction of sperm into female repro tract

**Male & female sexual organs are derived
from the same embryonic structures**

Descent of the gonads

1. gonads derived from same tissue as kidneys
2. both ovaries & testicles descend into pelvis
 - a. migration is 'retroperitoneal'
 - b. gonads 'drag' gonadal arteries/ veins into pelvis
3. migration starts @ 6-10 weeks gestation
 - completed by ~28 weeks
4. ovaries remain within the pelvis
5. testicles continue through abdominal wall into scrotum
6. inguinal canal (passage through abdominal wall)
 - a. testicular N.A.V.L.'s + ductus deferens
 - b. 'weak-point' in wall
 - c. Inguinal hernia
7. spermatic cord
 - a. testicular N.A.V.L.'s + ductus deferens
 - b. out-pocket of parietal peritoneum - *processus vaginalis*
8. gubernaculum (= *round ligament of the uterus*)
 - a. contraction of gubernaculum pulls testis into scrotum
 - b. contraction of round lig.s pulls ovaries into pelvis

Male reproductive system

Testis

1. human testicles relatively small in size (4 x 2.5 cm)
2. production of sperm - spermatogenesis
3. production of testosterone
4. tunica albuginea: dense CT surrounds & supports testis

Accessory structures in males

1. Scrotum

- a. testicles must be kept cool 32C (body temp = 37C).
- b. scrotum is an evaporative cooler for the testis
 - pendant pouch of skin with sweat glands and hair
- c. pampiniform plexus = counter-current heat exchanger
- d. cremaster m. - muscle within spermatic cord
 - 'cremasteric reflex' - temperature control

2. Epididymus

- a. Stores spermatozoa and facilitates maturation
- b. Recycles damaged spermatozoa

3. Seminal vesicle -

- a. liquefies semen, provides 60% of the seminal volume
- b. secretes fructose to keep the sperm alive

4. Prostate gland - Secretes substances to:

- a. liquefy semen, 30% of the seminal volume
- b. counteract the acidity of the vagina

5. Bulbourethral gland -

- a. 5% of the seminal volume
- b. secretes alkaline lubricative fluid

Seminal Fluid Contents

- 20-100 million sperm per ml, 1-5 ml per ejaculate
- total 20-500 million sperm per ejaculate
- pH (7.2 - 7.8)
- high fructose concentration (2-6 mg/ml)

Sperm pathway:

1. seminiferous tubules produce sperm & testosterone
2. seminiferous tubules coalesce to form efferent ducts
3. efferent ducts coalesce to form epididymus (coiled, 15')
4. epididymus narrows to become the ductus deferens
5. ductus deferens
 - a. travels through spermatic cord
 - b. enters abdominal cavity
 - c. descends towards bladder
 - d. expands distally to form an ampulla
6. D. deferens + duct of seminal vesicle: ejaculatory duct
7. sperm leaves ejaculatory duct to enter prostatic urethra
8. sperm passes through membranous & penile urethrae
9. Sperm finally exits body at the external urethral orifice

Penis - external genitalia in males

- surrounds urethra
- introduces semen into the female
- composed of the root, shaft & glans
- hemotumescent....

1. Corpora cavernosa (2)

- paired hemotumescent bodies in dorsum of penile shaft
- each corpus attached to the pubis via the crus
- each crus surrounded by the ischiocavernosus m.

2. Corpus spongiosum (1)

- single hemotumescent structure in shaft of penis
- corpus exhibits an expanded bulb at proximal end
- corpus terminates distally with the glans penis
- penile urethra perforates both the bulb & glans.
- corpus is surrounded by the bulbospongiosus m.
 - expels urine/semen from penile urethra

3. Deep fascia - binds corpora & their muscles together.

4. Regions of the urethra in males:

- prostatic - passes through prostate gland
- membranous - ext. urethral sphincter/pelvic diaphragm
- penile - corpus spongiosum/glans

5. Prepuce - (foreskin) extends over the glans

Circumcision = removal of foreskin (prepuce)