PELVIS II: FUNCTION

TABOOS

(THE VISCERA)

- Defecation
- Urination
- Ejaculation
- Conception
REVIEWS OF PELVIS I
- Pelvic brim, inlet
- Pelvic outlet
- True pelvis--viscera
- Tilt forward
Mid-sagittal views--how the pelvic viscera work
STRUCTURES

- Rectum
- Internal anal sphincter
- External anal sphincter
**FUNCTION**

- **Internal sphincter**
  - smooth muscle--
  - tonic tension
  - relaxes

- **External sphincter**
  - skeletal muscle--
  - conscious
  - relaxation

- **Lower abdominal wall**
  - contracts
  - pressurizing
  - celom
  - forcing
  - feces out from
  - rectum, sigmoid colon, descending colon
STRUCTURES
- Bladder
- Urethra
  (from kidney lecture)
- Kidneys
- Ureters

FUNCTION
- Stretch receptors in bladder signal desire to urinate
- Smooth muscle of bladder wall contracts and internal sphincter of urethra relaxes
- Abdominal muscles contract to pressurize celom and force urine out
Ejaculation

**FUNCTION**
- Sperm mature and collect in epididymis
- Move through vas deferens by peristalsis of smooth muscle of wall of vas
- Seminal vesicles, prostate contribute to semen
- Internal urethral sphincter (at bladder wall) prevents sperm backflow into bladder
- Contractions of urethra move semen to penis
- Bulbospongiosus m. (around urethra in penis) contracts to expel semen

**STRUCTURES**
- Testes
- Vas (ductus) deferens
- Seminal glands (vesicles)
- Prostate
- Urethra
- Corpus spongiosum
- Bulbospongiosum m.
Epididymis
- Contains efferent ductules: tube from rete testis to duct of epididymis
- Gain ability to swim here
- Smooth muscle layer = ejaculation
- Epithelial layer lined w/stereocilia
  - Resorb excess testicular fluid
  - Transfer nutrients to sperm in lumen

Vas Deferens
- Tube from duct of epididymis to ejaculatory duct
Route of sperm is convoluted--testicles to spermatic cord (vas deferens) through inguinal canal around to join urethra at inferior bladder

**SPERMATIC CORD**

- Collective name for structures associated with the scrotum
- Passes through inguinal canal
- Includes
  - Vas Deferens
  - Testicular Arteries + Veins
  - Cremaster Muscle + fibers
  - Nerves
BULBOURETHRAL (PAIRED)
- inferior to prostate
- within urogenital diaphragm
- empties into spongy urethra
- Function: produce mucous
  - neutralize urine in urethra
  - lubricate semen for passage

SEMINAL VESICLES (PAIRED)
- posterior surface of bladder
- contracts during ejaculation
- empties into vas deferens
- Functions
  - nourish sperm
  - stimulate uterine contractions
  - suppress immune response
  - enhance sperm motility
  - clot ejaculated sperm once in vagina, then liquefy to allow swim

PROSTATE
- inferior to bladder, anterior to rectum
- encircles first part of urethra
- contracts during ejaculation
- Functions: clot, liquefy, motility
- root = attached end
  - crura-anchored to pubic arch, covered by ischiocavernosus muscle
  - bulb-secured to urogenital diaphragm
- glans penis = enlarged tip
- prepuce = loose cuff around glans (circumcision)
- Erectile bodies
  - 3 long strips of erectile tissue around the spongy urethra
  - thick tube covered by dense CT and filled with smooth muscle, CT + vascular spaces
- Corpus spongiosum
  - distally = glans penis
  - proximally = bulb of penis
  - midventral erectile body
- Corpora cavernosa
  - proximally = root/crura of penis, covered by ischiocavernosus m.
  - paired, dorsal erectile bodies
  - make up most of mass
**STRUCTURES**
- Vagina
- Uterus
- Cervix
- Fallopian tube
- Fimbriae
- Ovary
- Broad ligament
- Mesenteries of pelvic cavity

**FUNCTION**
- Vagina is muscular tube—penis enters during intercourse
- Monthly, unfertilized egg bursts from ovary and is picked up by fimbriae, moves down fallopian tube
- Sperm and egg meet--fertilization--in Fallopian tube
- (more next lecture on Intercourse/con)
External Genitalia - Female

- **mons pubis**: fatty pad over pubic symphysis
- **labia major**: fatty skin folds
- **labia minor**: smaller, hairless folds inside labia major
- **vestibule**: created by labia minor; opening for urethra and vagina
- **greater vestibular glands**: either side of vaginal opening; secrete mucus into vaginal orifice
- **clitoris**: superior to vestibule
  - crura, prepuce, corpus cavernosum
  - NO corpus spongiosum
- **Central tendon = perineal body**

M&M, Fig. 24.20, 21
Ovulation--the only cell that gets into the celom

- Uterus, ovaries, fallopian tube, fimbriae
- Broad ligament is mesentery that connects to lateral body wall
- How does egg get from ovary into opening of fallopian tube/oviduct
- Pops out into
- Uterine Tubes = Oviducts = Fallopian Tubes
  - from near ovaries to uterus
  - Run lateral (ovary) to medial (uterus)
  - infundibulum
    - expanded, proximal portion
    - fimbrae on edges
- Ligaments
  - Ovarian ligament
    • connects ovaries to uterine wall (medial)
  - Suspensory ligament
    • connects ovaries pelvic wall (lateral)
  - Broad ligament
    • supports uterus, oviducts
- Movement of Ova in Oviduct
  - receives oocyte after ovulation
  - peristaltic waves
  - cilia lining tube
  - contains cells to nourish ova
- Site of fertilization
- Ectopic pregnancy: implantation of zygote outside of uterus

Ovaries, oviducts, uterus--details
Development of external genitalia in female/male:

- Genital tubercle
- Urethral fold
- Labioscrotal swelling
- Anus
- Tail (cut)

(c) Female development

- Clitoris
- Labia majora
- Anus
- Labia minora

(b) Male development

- Penis
- Labioscrotal swellings (scrotum)
- Anus
- Gland penis
- Scrotum
- Anus
Development of Reproductive Organs

- **Gonadal ridge**: forms in embryo at 5 weeks and gives rise to gonads (intermediate mesoderm with kidneys)

- **Wolffian ducts**: form male duct (vas deferens)

- **Mullerian ducts**: form female duct (uterine tube)
  - Both ducts are present in embryo—only one develops!

- **External genitalia develops from same structures**
  - Labioscrotal swelling: Scrotum = Labia major
Coming Next

Reproduction and Early Fetal Development