The Male and Female Reproductive System
Complementary structures in males and females

- Gonads - gamete formation and sex hormone secretion
- Ducts for storage and transport
- Accessory glands - support for gametes
- Supporting structures
  - Delivery and fertilization of gametes
  - Embryonic and fetal development
Similarities and differences between males and females

- Primary sex organs: **gonads**
  - *Testes* in males
  - *Ovaries* in females
  - These produce the **gametes** (sex cells)
    - *Sperm* in males
    - *Ovum* (egg) in females
  - Endocrine function also: secretion of hormones

- Accessory sex organs
  - Internal glands and ducts
  - External genitalia
Overview of the male reproductive system

Internal Organs

- Urinary bladder
- Ductus (vas) deferens
- Suspensory ligament of penis
- Pubic symphysis
- Prostate

External Organs

- Deep perineal muscles
- Bulbourethral (Cowper's) gland
- Corpora cavernosum penis
- Spongy (penile) urethra
- Penis
- Corpus spongiosum penis
- Corona
- Glans penis
- Prepuce (foreskin)
- External urethral orifice

(a) Sagittal section
Male Reproductive System

- **Testes**
  - Primary organs
    - Develop in the abdominal pelvic cavity of fetus
    - Descend into scrotal sac shortly before or after birth
  - Produce the male sex cells (sperm)
  - Produce the male hormone testosterone

- **Scrotum** – sac that holds the testes

- **Seminiferous tubules**
  - On top of testes
  - Filled with spermatogenic cells that produce sperm cells

- Interstitial cells produce testosterone
Male Reproductive System: 
*Internal Accessory Organs*

- **Epididymis**
  - Sits on top of each testis
  - Receives spermatids from seminiferous tubules
  - Spermatids become sperm cells

- **Vas deferens**
  - Tube connected to epididymis
  - Carries sperm cells to urethra

- **Seminal vesicle**
  - Secrete
    - Fluid rich in sugar used to make energy
    - **Prostaglandins** – stimulate muscular contractions in female to propel sperm forward

- **Seminal fluid**
  - Released into vas deferens just before ejaculation
  - 60% of semen volume
Male Reproductive System: 
*Internal Accessory Organs*

- **Prostate gland**
  - Surrounds urethra
  - Produces and secretes a milky, alkaline fluid into urethra just before ejaculation
  - Fluid protects sperm in the acidic environment of the vagina
  - 40% of semen

- **Bulbourethral (Cowper’s) glands**
  - Produce a mucus-like fluid
  - Secreted just before ejaculation
  - Lubricates end of penis

- **Semen**
  - Alkaline mixture
  - Nutrients
  - Prostaglandins
  - 1.5 to 5.0 ml per ejaculate
  - Sperm count of 40 to 250 million / ml
Male Reproductive System: *Internal Accessory Organs*

- **Scrotum**
  - Holds testes away from body
  - Temperature 1 °C below body temperature
  - Lined with serous membrane that secretes fluid
    - Testes move freely

- **Penis**
  - **Shaft**
    - Erectile tissues surround urethra
  - **Glans penis**
    - Cone-shaped structure on end of penis
  - **Prepuce**
    - Skin covering glans penis in uncircumcised males

  **Functions**
  - Deliver sperm
  - Urination
Features of male reproductive system

- Scrotum- sac keep testes external to body
- Septum divides scrotum into two sacs
- Dartos helps maintain position and internal temperature
- Well vascularized (pudendal, cremasteric branch of inferior epigastric artery)
- Testes descend into scrotum through inguinal canals during development
Male reproductive system

- Testes (singular testis): the gonads
  - In embryo, first develop in posterior abdominal wall, then migrate
  - Internal body temp too hot for viable sperm
  - Temp cooler in the scrotum because of superficial position
- Scrotum (=pouch) has septum dividing it
- Each testis is about 2.5 cm x 4 cm in size, within scrotum
- Dartos and cremaster muscles move testes in response to hot or cold
- Serous sac partially encloses each testis: the *tunica vaginalis*
  - Develops as outpocketing of peritoneal cavity
- Just deep to tunica vaginalis is *tunica albuginea* - fibrous capsule
  - Septal extensions of it divide testis into 250-300 lobules
  - Each lobule contains 1-4 coiled seminiferous tubules: make sperm
- Just deep to tunica vaginalis is **tunica albuginea** - fibrous capsule
  - Septal extensions of it divide testis into 250-300 lobules
- Each lobule contains 1-4 coiled **seminiferous tubules**: make sperm
  - Converge to form straight tube (tubulus rectus), then conveys sperm into rete testis
- Sperm leave testis through efferent ductules which enter **epididymis**
- Blood supply: **pampiniform plexus**: from L2 not pelvic level, since descended from abdomen

(lateral views)
Structure and function of the testis (plural: testes)

- Divided into lobules
- Seminiferous tubules are tightly packed within them
- Cells within tubules:
  - Spermatogenic cells
  - Sertoli cells regulate sperm formation
- Leydig (interstitial) cells secrete testosterone

(a) Sagittal section of a testis showing seminiferous tubules
Spermatogenesis: sperm formation

- Begins at puberty
- 400 million sperm/day

- Three stages:
  - Formation of spermatocytes
  - Meiosis
  - Spermiogenesis
1st stage: formation of spermatocytes

- Spermatogonia are stem cells
  - Least differentiated (earliest in the process)
  - Lie in basal lamina
- Divide continuously by mitosis (result 2n or diploid): daughter cells A (remains a stem cell) or B (goes on)
- When start to undergo meiosis are by definition called *spermatocytes*
- 2\textsuperscript{nd} stage: meiosis I
  - Each primary spermatocyte (2n) undergoes meiosis I to become 2 secondary spermatocytes:
  - Each secondary spermatocyte undergoes meiosis II to become 2 spermatids
  - Therefore 4 total spermatids from each spermatogonium
- 3\textsuperscript{rd} stage: spermiogenesis
  - Spermatids differentiate into sperm
Stage 3: Spermiogenesis: spermatid streamlined to sperm

- Head contains
  - Nucleus with chromatid (genetic material)
  - Acrosome with enzymes for penetrating egg
- Midpiece: mitochondria spiraled around the core of the tail
- Tail is an elaborate flagellum (allows sperm to swim)
- Sperm can swim only after they have left the testis
- Process of spermatogenesis is controlled by two hormones
  - **FSH** (follicle stimulating hormones) from anterior pituitary
  - **Testosterone**
    - primary male hormone
    - produces by testes
- Sperm surrounded by **Sertoli** (sustenacular) cells: tight junctions
  - Prevents escape of unique antigens seen as foreign
  - These would activate the immune system
  - Autoimmune response would cause sterility
  - Other functions as well
- Interstitial or **Leydig cells**: secrete **androgens**
  - Male sex hormones
  - Main one is **testosterone**
  - Into blood, sustain all male sex characteristic and sex organs
Transport of sperm from the testis

- Lumen of seminiferous tubule
- Rete testis
- Efferent ducts
- Ductus epididymis
- Ductus deferens
- Ejaculatory ducts
- Urethra
  - Prostatic (prostate)
  - Membranous (muscles)
  - Spongy (corpus spongiosum)
- Sperm leave testis through **efferent ductules**
  - Lined by simple columnar epithelium
  - Cilia and smooth muscle in wall help move sperm along
- Sperm mature in **epididymus** (20 days)
  - Head of epididymus contains the efferent ductules which empty into duct of the epididymus
  - Sperm gain ability to swim
  - Sperm can be stored in epididymus for several months

**Duct of epididymis**: highly coiled 6m long duct (pic left is multiple coils of same duct)
*Note pseudostratified columnar epithelium

**Ductus (vas) deferens**: note thick layers of smooth muscle
- Sperm are ejaculated from the epididymus
  - Not directly from the testes
- Vas deferens (or ductus deferens) 45cm (18”)
  - Stores and transports sperm during ejaculation
  - Runs superiorly from scrotum within spermatic cord, through inguinal canal and enters pelvis
  - Histo: see previous slide

- **Vas** arches medially over ureter
- Descends along posterior wall of bladder
- Ends in **ampulla** which joins duct of **seminal vesicle** to form short ejaculatory duct
- Each **ejaculatory duct** runs within prostate where empties into prostatic urethra
**Spermatic cord:**
- Vas deference is the largest component
- Is a tube of fascia also containing nerves and vessels
- Runs in inguinal canal

**Inguinal canal** has 2 rings:
1. Superficial (medial)
2. Deep
- **Seminal vesicles**
  - On posterior bladder
  - Secrete fluids and substances which constitute 60% of semen
  - Their ducts join vas deferens
- **Sperm and seminal fluid mix in** **ejaculatory duct**
- **Prostate**: note here and next slide
- **Bulbourethral glands**
  - Secrete mucus during sexual excitement and ejaculation (lubricant)
The Prostate

- Size & shape of a chestnut
- Encircles 1\textsuperscript{st} part of urethra
- 3 types of glands
  - Contribute to semen (milky fluid and enzymes)
  - **PSA** measured as indicator of prostate cancer ("prostate specific antigen")
- Fibromuscular stroma
- Male external genitalia
  - Scrotum
  - Penis
- Penis: 3 parts
  - Root (attached)
  - Free shaft or body
  - Enlarged tip called *glans penis*
- Skin of penis is loose
  - Prepuce or foreskin
    - Cuff around glans
    - Removed if circumcision
- See cross section, penis
  - Urethra (called spongy or penile urethra here)
  - 3 erectile bodies (*parasympathetic* stimulation during sexual excitation causes engorgement with blood allowing erection):
    - *Corpus spongiosum*
    - *Pair of corpora cavernosa*
  - Vessels and nerves
- Ejaculation caused by *sympathetic* nerves
  - Contraction of smooth muscle of ducts and penis
The Female Reproductive System

- Production of gametes (ova, or eggs)
- Preparation for support of developing embryo during pregnancy
- Cyclic changes: menstrual cycle
  - Averages 28 days
  - Complex interplay between hormones and organs: at level of brain, ovaries and uterus
Overview of the female reproductive system

Internal Organs
- Myometrium
- Perimetrium
- Uterus
- Endometrium
- Uterine tube
- Ovary
- Broad ligament
- Vesicouterine pouch
- Urinary bladder
- Pubic symphysis
- Urethra
- Paraurethral glands
- Clitoris
- Labium minus
- Labium majus
- Greater vestibular gland

External Organs
- Rectouterine pouch
- Sigmoid colon
- Fornix
- Cervix
- Rectum
- Vagina
- Anus

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Female Reproductive System:  

**Ovaries and Ovum Formation**

- **Ovaries**
  - Primary sex organs produce
    - Sex cells called *ova*
    - Hormones estrogen and progesterone
  - Located in the pelvic cavity
- **Medulla**
  - Inner area; contains nerves, lymphatic vessels, and blood vessels
- **Cortex**
  - Outer area; contains ovarian follicles
- Covered by epithelial and dense connective tissues
Female Reproductive System: 
**Ovaries and Ovum Formation**

- Primordial follicles develop before birth and contain
  - A primary oocyte or immature ovum (born with maximum number)

- Follicular cells

- **Oogenesis** is the process of ovum formation
  - At puberty, primary oocytes are stimulated to continue meiosis
    - Becomes 1 polar body (a nonfunctional cell) and
    - A secondary oocyte
  - Secondary oocyte released during ovulation
  - If fertilized, the oocyte divides to form a mature, fertilized ovum
Female Reproductive System: Internal Accessory Organs

- Fallopian tube – oviduct
  - Infundibulum and fimbriae
    - Fringed, expanded end of fallopian tube near ovary
    - Function to “catch” an ovum

- Muscular tube
  - Lined with mucous membrane and cilia
  - Propels ovum toward uterus
Female Reproductive System: Internal Accessory Organs

- Uterus
  - Hollow, muscular organ
  - Receives embryo and sustains its development
- Divisions
  - Fundus – domed upper portion
  - Body – main portion
  - Cervix – narrow, lower section extending into vagina (*cervical orifice*)

- Wall of uterus
  - Endometrium
    - Innermost lining
    - Vascular
    - Tubular glands – mucus
  - Myometrium
    - Middle, thick, muscular layer
  - Perimetrium
    - Thin layer covering the myometrium
    - Secretes serous fluid to coat and protect uterus
Female Reproductive System: 
*Internal Accessory Organs*

- **Vagina**
  - Tubular, muscular organ
  - Extends from uterus to outside body *(vaginal introitus)*
  - Muscular folds – *rugae* – enable expansion
    - Receive erect penis
    - Passage for delivery of offspring and uterine secretions
- **Wall**
  - Innermost mucosal layer
  - Middle muscular layer
  - Outer fibrous layer
Female Reproductive System:

External Accessory Organs

- **Mammary glands**
  - Secretion of milk
  - **Structures**
    - **Nipple**
      - Oxytocin induces lactiferous ducts to deliver milk through openings
    - **Areola** – pigmented area around nipple
    - **Alveolar glands** – within mammary glands
      - Make milk when stimulated by prolactin
Female Reproductive System: 
  *External Genitalia*

- Collectively known as the **vulva**

- **Labia majora**
  - Rounded folds of adipose tissue and skin
  - Protect other external reproductive organs

- **Labia minora**
  - Fold of skin between labia majora
  - Very vascular
  - Merge to form hood over clitoris
  - **Vestibule** – space enclosed by labia minora
    - Bartholin’s glands secrete mucus during sexual arousal
Female Reproductive System: 
*External Genitalia*

- **Clitoris**
  - Anterior to urethral meatus
  - Contains female erectile tissue
  - Rich in sensory nerves

- **Perineum**
  - Between vagina and anus
  - Area for *episiotomy*, if needed, during birth process
- Gonads: the ovaries
  - Paired, almond-shaped, flanking the uterus in lateral wall of true pelvis
  - 3 x 1.5 x 1 cm in size
Ovaries are retroperitoneal, but surrounded by peritoneal cavity.

Held in place by mesentery and ligaments:
- Broad ligament
- Suspensory ligament of the ovary
- Ovarian ligament

Innervation:
- Sympathetic and parasympathetic
Structure of ovary

- Fibrous capsule is called **tunica albuginea**
- Outer cortex houses developing gametes the **oocytes**, within **follicles**
- Inner medulla is loose connective tissue with largest vessels and nerves
The Ovarian Cycle

- **Follicular phase**
  - 1st approx 14 days but variable
  - Egg develops in a follicle
  - Stimulated by FSH (see next slide)
  - Estrogen produced

- **Ovulation**
  - Egg released from follicle (LH surge)
  - Egg in abdominal cavity
  - Picked up by fimbria of fallopian tube
  - Not necessarily halfway point
The Ovarian Cycle

- **Luteal phase**
  - Postovulatory phase
  - 14 days (more constant)
  - Corpus luteum develops from exploded follicle
  - Produces progesterone as well as estrogen
    - Progesterone stimulates uterus to be ready for baby
  - If no pregnancy, corpus luteum degenerates into corpus albicans
Nearly mature follicle

- Oocyte develops the **zona pellucida**
  - Glycoprotein coat
  - Protective shell (egg shell)
  - Sperm must penetrate to fertilize the oocyte
- Thecal cells stimulated by LH to secrete androgens
- Granulosa cells (with FSH influence) convert androgens to estrogen (follicular cells called granulosa cells now)
- Clear liquid gathers to form fluid-filled antrum: now a secondary follicle
- Surrounding coat of granulosa cells: **corona radiata**
- Fully mature, ready to ovulate, called: **“Graafian follicle”**
Structure of the uterine (fallopian) tubes

Ciliated cells help move ovum. Fertilization usually occurs in ampulla.
**Fallopian (uterine) tubes**

Fimbriae (fingers) pick up egg

Beating cilia and muscular peristalsis propel egg to uterus

Empties into superior part of uterus*

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Cross section through entire tube

- **Muscularis**
- **Mucosa**

Enlargement of mucosa layer showing ciliated columnar epithelium

- **Ciliated columnar epithelium**
- **Nonciliated epithelium**
- **Lamina propria**
Features of the uterus

- Muscularity is prominent
- Perimetrium is part of peritoneum
- Myometrium- three layers of smooth muscle
- Endometrium- highly vascularized; secretory
Female Reproductive Cycle
Hormonal Regulation of Changes in the Ovary and Uterus
The Uterus

- In pelvis anterior to rectum and posterosuperior to bladder
- Hollow, thick-walled organ
  - Receives
  - Retains
  - Nourishes fertilized egg=embryo

Uterus is pear-shaped (before babies)
Usually anteverted, can be retroverted
Parts of uterus:
- Body (major part)
- Fundus
- Isthmus
- Cervix

**Cavity of uterus**
- Small (except in pregnancy)

**Cervical canal**
- Internal os
- External os

**Vagina**

**Cervix**
- Tough, fibrous ring
- Inferior tip projects into vagina
- Produces mucus
The Uterine Wall

- Three basic layers
  - **Perimetrium**: outer serous membrane
  - **Myometrium**: middle muscle
  - **Endometrium**: inner mucosal lining

Uterine supports:
- **Mesometrium** (largest division of broad lig) – main support
- **Cardinal ligament**
- **Round ligament** (Prolapse)
Endometrium (inner mucosal lining of uterine cavity)

- Simple columnar epithelium containing secretory and ciliated cells
- Lamina propria of connective tissue

2 main layers (Stratum)
1. Functionalis (functional layer)
2. Basalis (basal layer)

(shed if no implantation of baby)

(not shed)
- Pituitary hormones
  - FSH: follicle stimulating hormone
  - LH: luteinizing hormone

- Ovarian hormones
  - Estrogen
  - Progesterone
The cyclic changes of uterine wall and follicle (hormone graphs should be above)

**Proliferative phase**: rebuilds itself after slough

**Secretory phase**: vascular rich glands enlarge: will sustain baby (needs progesterone: corpus luteum initially then placenta)

If no baby, decreasing progesterone - slough
Inhibin: inhibits pituitary secretion of FSH
Histology of the vagina

- Stratified squamous epithelium protects tissue
- Secretions produce an acidic environment
- Double layer of smooth muscle
The Vagina

- Thin-walled tube
- Inferior to uterus
- Anterior to rectum
- Posterior to urethra & bladder
- “Birth canal”
- Highly distensible wall: 3 layers
  - Adventitia
  - Muscularis
  - Mucosa
Female external genitalia

- Known as vulva or pudendum
- Vestibule is found between labia minora
External female genitalia-vulva or pudendum

- **Mons pubis**: fatty pad over pubic symphysis, with hair after puberty
- **Labia (lips) majora**: long fatty hair-covered skin folds
- **Labia minora**: thin, hairless, folds enclosing vestibule
- **Vestibule**: houses external openings of urethra and vagina
  - Urethra is anterior (drains urine from bladder)
  - Baby comes out through vagina (vaginal orifice in pic)
- **Clitoris**: anterior, homolog of penis (sensitive erectile tissue)
- **Perineum**: diamond shaped region
Mammary glands

- Modified sweat glands that produce milk
- Lactiferous ducts are located in nipple
- Milk-secreting glands: alveoli
- Drains into mammary ducts, eventually into lactiferous ducts
- Milk production controlled by prolactin; milk ejection by oxytocin
Mammary glands (breasts)

- Modified sweat glands
- Both sexes but function (normally) only in lactating female
- Produce milk to nourish baby
- Respond to hormonal stimulation
- Lymph drains into parasternal and axillary lymph nodes
- Nipple surrounded by pigmented ring of skin, the areola
- Muscles underneath: pectoralis major and minor, parts of serratus anterior and external oblique
- Mammary glands consist of 15-25 lobes
- Each a distinct compound alveolar gland opening at the nipple
- Separated by adipose and suspensory ligaments
- Smaller lobules composed of tiny alveoli or acini
  - Like bunches of grapes
  - Walls: simple cuboidal epithelium of milk-secreting cells
  - Don’t develop until half-way through pregnancy (ducts grow during puberty)
- Milk passes from alveoli through progressively larger ducts
  - Largest: lactiferous ducts, collect milk into sinuses
Development of Male and Female Reproductive System
- The gonads begin to attain sexual characteristics from 7th week.
- Early genital systems in two sexes are similar; this initial period is called **indifferent state of sexual development**.
Development of gonads (testes and ovaries)

- The mesothelium (mesodermal epithelium) lining the posterior abdominal wall
- The underlying mesenchyme (embryonic connective tissue)
- The primordial germ cells
Indifferent gonads

- During the 5th week a thickened area of mesothelium develops on the medial side of the mesonephros: a pair of gonadal (genital) ridges
- Finger-like epithelial cords (gonadal cords) grow into the underlying mesenchyme
- The indifferent gonad now consists of an external cortex and an internal medulla.
- If the embryo is XX: cortex will differentiate into an ovary, medulla regress
- If the embryo is XY medulla differentiates into a testis, cortex regress except for vestigial remnants
Primordial germ cells

- Large spherical sex cells are visible early in the 4th week among the endodermal cells of the yolk sac near the origin of the allantois.
- During folding of the embryo dorsal part of the yolksac is incorporated into embryo.
- Thus the primordial germ cells migrate along the dorsal mesentery of the hindgut to the gonadal ridges.
- During 6th week primordial germ cells enter the underlying mesenchyme and are incorporated in the gonadal cords.
Sex determination

- Chromosomal and genetic sex is established at fertilization.

- The type of gonads that develop is determined by the sex chromosome complex of the embryo (XX or XY).

- Before 7th week gonads of 2 sexes are identical (indifferent gonads).

- Male phenotype requires Y chromosome (SRY-sex determining region on Y gene) for a testis determining factor-TDF.

- Female phenotype requires two X chromosomes with a number of genes.
Development of testes

- TDF induces the gonadal cords (seminiferous cords) to condense and extend into the medulla of the indifferent gonad; where they branch and anastamose to form the rete testis.
- A dense layer of fibrous CT (tunica albuginea) separates the testis cords from the surface epithelium
- In the 4th month testis cords become horseshoe shaped; their extremities are continous with those of the rete testis
- Testis cords are now composed of primitive germ cells and sustentacular cells of Sertoli derived from the surface epithelium of the gland
Development of testes

- Interstitial cells of Leydig derived from the original mesenchyme of the gonadal ridge begin development shortly after onset of differentiation of these cords.

- Leydig cells lie between the testis cords and begin testosterone production by 8th week of gestation.

- Thus the testis is able to influence sexual differentiation of the genital ducts and external genitalia.
Gonadal development occurs slowly in female
- In XX embryo primitive sex cords dissociate into irregular cell clusters containing groups of primitive germ cells in the medullary part of ovary
- Later they disappear and are replaced by a vascular stroma that forms the ovarian medulla
Development of ovaries

- Surface epithelium of the female gonad (unlike that of the male) continues to proliferate giving rise to a second generation of cords (cortical cords) in the 7th week.
- Cortical cords penetrate the underlying mesenchyme but remain close to the surface.
- In the 4th month cortical cords split into isolated cell clusters with each surrounding one or more primitive germ cells.
- Germ cells develop into oogonia, surrounding epithelial cells, descendants of the surface epithelium form follicular cells.
44 + XY

Y influence

Testis

Medullary cords develop
No cortical cords
Thick tunica albuginea

44 + XX

Absence of Y

Ovary

Medullary cords degenerate
Cortical cords develop
No tunica albuginea

Indifferent gonad
At the beginning both male and female embryos have 2 pairs of genital ducts:
- Mesonephric (wolffian) ducts
- Paramesonephric (müllerian) ducts arising as a longitudinal invagination of the epithelium on the antlat surface of the urohenital ridge

Two ducts are separated by a septum but later fuse to form the uterine canal.

The caudal tip of the combined ducts projects into the posterior wall of the urogenital sinus causing a swelling (paramesonephric/müllerian tubercle)

The mesonephric ducts open into the urogenital sinus an either side of the mullerian tubercle
Development of genital ducts: Indifferent stage

7th week

9th week
Testis

Müllerian inhibiting substance (Sertoli cells)

Testosterone (Leydig cells)

Mesonephric ducts stimulated (vas deferens, epididymis)

Dihydrotestosterone

External genitalia stimulated

Growth of penis, scrotum, and prostate

Ovary

Estrogens (including maternal and placental sources)

Parmesonephric ducts stimulated (uterine tube, uterus, upper portion of vagina)

External genitalia stimulated (labia, clitoris, lower portion of vagina)
Uterine abnormalities

A. Normal uterus and vagina
B. Double uterus
C. Double uterus with single vagina
D. Bicornuate uterus
E. Bicornuate uterus with a rudimentary left horn
F. Septate uterus
G. Unicornuate uterus
Descent of the testes

- Testicular descent is associated with
  - Enlargement of testes and atrophy of mesonephroi (mesonephric kidneys)
  - Atrophy of mesonephric ducts induced by the MIS
  - Enlargement of processus vaginalis guiding the testis through inguinal canal into scrotum
  - By 26 weeks have descended retroperitoneally from the posterior abdominal wall to the deep inguinal rings
- Androgens, gubernaculum (a mesenchymal condensation) may guide the descent

- Descent may take 2-3 days and the inguinal canal contracts after they enter the scrotum

- As the testis and the ductus deferens descend they are ensheathed by the facial extensions of the abdominal wall
Descent of the ovaries

- Descent is considerably less in female
- The ovaries settle below the rim of the true pelvis
- Cranial genital ligament forms the **suspansory ligament of ovary**
- Caudal genital ligament forms the **ligament of the ovary proper** and the **round ligament of the uterus**