The Reproductive System

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Introduction

• The reproductive system is designed to perpetuate the species
  • The male produces **gametes** called sperm cells
  • The female produces **gametes** called ova
  • The joining of a sperm cell and an ovum is fertilization
  • Fertilization results in the formation of a **zygote**
Anatomy of the Male Reproductive System

• Overview of the Male Reproductive System
  • Testis
  • Epididymis
  • Ductus deferens
  • Ejaculatory duct
  • Spongy urethra (penile urethra)
  • Seminal gland
  • Prostate gland
  • Bulbo-urethral gland
Figure 27.1 The Male Reproductive System, Part I

- Pubic symphysis
- Prostatic urethra
- Membranous urethra
- Corpus cavernosum
- Corpus spongiosum
- Spongy urethra
- Ductus deferens
- Penis
- Epididymis
- Testis
- External urethral orifice
- Scrotum
- Ureter
- Urinary bladder
- Seminal gland
- Rectum
- Prostate gland
- Ejaculatory duct
- Bulbo-urethral gland
- Anus
- Sigmoid colon (cut)
- Rectus abdominis
- Urinary bladder
- Pubic symphysis
- Bristle within ejaculatory duct
- Membranous urethra
- Spongy urethra
- Bulbospongiosus muscle
- Corpus cavernosum
- Epididymis
- Testis
- Scrotum

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Anatomy of the Male Reproductive System

• The Testes
  • Testes hang inside a pouch called the **scrotum**, which is on the outside of the body
  • During development, the testes form inside the abdominal cavity near the kidneys
  • Testes descend toward the scrotum by passing through the **inguinal canals**
  • The **ductus deferens**, blood vessels, lymphatics, and nerves remain bundled to the testes in the **spermatic cords**
Figure 27.2b The Descent of the Testes (Part 1 of 2)

Anterior views of the opened abdomen at representative stages in the descent of the testes.

- **2 months:**
  - Diaphragmatic ligament
  - Mesonephric duct
  - Developing kidneys
  - Gonads
  - Gubernaculum testis

- **3 months:**
  - Kidney
  - Diaphragmatic ligament
  - Epididymis
  - Testis

- **4 months:**
  - Epididymis
  - Testis
  - Urinary bladder
Anterior views of the opened abdomen at representative stages in the descent of the testes
Anatomy of the Male Reproductive System

• The Scrotum
  • Divided into two chambers (two scrotal cavities)
  • Chambers are separated by the perineal raphe, which can be seen as thickened tissue that extends from the anus, across the scrotum, and along the anterior surface of the penis
  • Tunica vaginalis is a serous membrane that covers the outside of each testis and covers the inside lining of each scrotal cavity
Anatomy of the Male Reproductive System

• The Scrotum (continued)
  • The dermis of the scrotum contains the **dartos muscle**
    • Contraction causes the wrinkling of the scrotal surface
  • Deep to the dermis is the **cremaster muscle**
    • Contraction tenses the scrotal sac and pulls it closer to the body
    • The temperature for sperm development is 2°F cooler than body temperature
    • Therefore, if the temperature is cold outside, the testes move closer to the abdomen to maintain the proper temperature
Anatomy of the Male Reproductive System

- The Scrotum (continued)
  - The scrotum is highly vascularized by the:
    - **Internal pudendal arteries** (come from the internal iliac a.)
    - **External pudendal arteries** (come from the femoral a.)
    - **Inferior epigastric arteries** (come from the external iliac a.)
  - The scrotum has nerves from the:
    - **Hypogastric plexus**
    - **Ilioinguinal nerves**
    - **Genitofemoral nerves**
    - **Pudendal nerves**
Figure 22.9 An Overview of the Systemic Arterial System
Diagrammatic horizontal section showing the anatomical relationships of the testes within the scrotal cavities. The connective tissues surrounding the seminiferous tubules and the rete testis are not shown.
Anatomy of the Male Reproductive System

• Structure of the Testes
  • **Tunica albuginea** is a tough fibrous lining of the testes and is covered by the tunica vaginalis
  • Tunica albuginea also goes into the testes and forms **septa**
  • Tunica albuginea forms septa going toward and converging in the area of the **mediastinum** of the testes
  • Mediastinum contains ducts that transport sperm to the **ductus deferens**
Anatomy of the Male Reproductive System

• Histology of the Testes
  • The *septa* of the testes separate the testes into *lobes*
  • Each lobe contains *seminiferous tubules*
  • Seminiferous tubules begin to uncoil leading to the *straight tubules* in the mediastinum area
  • The straight tubules interconnect with each other forming the *rete testis*
  • Rete testis forms the *efferent ductules*
  • Efferent ductules lead to the *ductus deferens*
Figure 27.4a Structure of the Testes

Diagrammatic horizontal section showing the anatomical relationships of the testes within the scrotal cavities. The connective tissues surrounding the seminiferous tubules and the rete testis are not shown.
Anatomy of the Male Reproductive System

• Histology of the Testes (continued)
  • There is a space between the coiled seminiferous tubules
  • The cells within this space are the **interstitial cells**
  • Interstitial cells produce and release **testosterone**
Figure 27.5ac  Histology of the Seminiferous Tubules

Seminiferous tubules in sectional view

- Seminiferous tubule containing late spermatids
- Seminiferous tubule containing spermatozoa
- Seminiferous tubule containing early spermatids

Spermatogenesis within one segment of a seminiferous tubule

- Interstitial cells
- Dividing spermatocytes
- Nurse cell
- Spermatogonia
- Spermatids
- Heads of maturing spermatozoa
- Tubular capsule
- Lumen
- Seminiferous tubule
Anatomy of the Male Reproductive System

• Spermatogenesis and Meiosis
  • **Spermatogenesis** is the formation of sperm cells
  • **Meiosis** is the set of events involved in producing the sperm cells
  • Meiosis begins in the outer layer of the seminiferous tubules
  • **Spermatogonia** are stem cells that will become sperm cells
Anatomy of the Male Reproductive System

• Spermatogenesis and Meiosis (continued)
  • At sexual maturation, spermatogonia divide
  • One of the cells produced by this division remains in the outer layer of the seminiferous tubules as a stem cell
  • The other cell produced by this division differentiates to become a primary spermatocyte
  • The primary spermatocyte begins to undergo meiosis
Meiosis associated with the formation of sperm cells is called **spermatogenesis**

- The **primary spermatocyte** undergoes division to produce two **secondary spermatocytes**
- Each secondary spermatocyte undergoes meiosis to produce four **haploid spermatids**
- Each spermatid matures to become a **haploid sperm cell**
Figure 27.5b Histology of the Seminiferous Tubules

SPERMATOGENESIS

MITOSIS of spermatogonium (diploid)

Primary spermatocyte (diploid)

DNA replication

Synapsis and tetrad formation

Primary spermatocyte

Tetrad

MEIOSIS I

Secondary spermatocytes

MEIOSIS II

Spermatids (haploid)

SPERMIOGENESIS (physical maturation)

Spermatozoa (haploid)

Meiosis in the testes showing the fates of three representative chromosomes
Anatomy of the Male Reproductive System

• Meiosis
  • Spermatids will mature to form a **spermatozoon** (sperm cell)
  • This maturation process is called **spermiogenesis**
  • While the spermatids are maturing, they become embedded in nurse cells
  • Upon maturation, the spermatids (now sperm cells) enter into the lumen of the seminiferous tubules
Anatomy of the Male Reproductive System

• Functions of the Nurse Cells
  • Maintenance of the blood–testis barrier
  • Support of spermatogenesis
  • Support of spermiogenesis
  • Secretion of inhibin
    • Controls the rate of sperm formation
  • Secretion of androgen-binding protein (ABP)
    • Binds testosterone within the seminiferous tubules so testosterone will continue to have an effect on spermiogenesis
Figure 27.5cd  Histology of the Seminiferous Tubules

Spermatogenesis within one segment of a seminiferous tubule

The blood–testis barrier and the structure of the wall of a seminiferous tubule
Anatomy of the Male Reproductive System

- Anatomy of a Spermatozoon
  - Each spermatozoon has three areas
    - **Head:**
      - Contains chromosomes
      - Contains *acrosomal cap* consisting of enzymes
    - **Middle piece (with the neck):**
      - Contains mitochondria
    - **Tail:**
      - Called the *flagellum*
      - Enables mobility of the sperm cell
Figure 27.6a  Spermiogenesis and Spermatozoon Histology

Spermatozoa

Histology of human spermatozoa

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Figure 27.6b  Spermiogenesis and Spermatozoon Histology

Differentiation of a spermatid into a spermatozoon

Spermatid

Mitochondria

Nucleus

Golgi apparatus

Acrosomal vesicle

Acrosomal cap

Shed cytoplasm

Spermatozoon

Mitochondrial spiral

Dense fibers

Fibrous sheath of flagellum

Tall (55 μm)

Middle piece (5 μm)

Neck (1 μm)

Head (5 μm)

Centrioles

Spermatozoon (week 5)

Microtubules
Anatomy of the Male Reproductive System

- The Male Reproductive Tract
  - Epididymis
  - Ductus deferens
  - Urethra
Anatomy of the Male Reproductive System

• The Epididymis
  • Sperm cells travel in the seminiferous tubules eventually to the epididymis to mature a little longer
  • The epididymis consists of three parts
    • **Head**: receives spermatozoa via the efferent ducts
    • **Body**: coiled tubes pass through the body
    • **Tail**: tubes begin to uncoil to become a single tube called the **ductus deferens**
Anatomy of the Male Reproductive System

• Functions of the Epididymis
  • Monitors the composition of the fluid in the seminiferous tubules
  • Recycling center for damaged spermatozoa
  • Stores spermatozoa for further maturation (about 2 weeks)
    • Mature sperm cells are not active until they become capacitated
Anatomy of the Male Reproductive System

• Functions of the epididymis (continued)
  • The process of **capacitation**
    • Sperm cells become motile when mixed with secretions from the seminal gland
    • Become capable of fertilizing an egg when exposed to the female reproductive tract
Figure 27.7b The Epididymis

Diagrammatic view of the testis and epididymis showing the sectional plane of part (c)
Anatomy of the Male Reproductive System

• The Ductus Deferens
  • Also called the **vas deferens**
  • Begins at the tail of the epididymis
    • Ascends into the abdominal cavity through the inguinal canal
    • Curves around the urinary bladder and the ureter
    • Descends back toward and through the prostate gland; before entering the prostate gland, the ductus deferens expands (**ampulla**) and becomes the **ejaculatory duct**; the **ejaculatory duct** enters the prostate gland
Figure 27.8a The Ductus Deferens and Accessory Glands

A posterior view of the urinary bladder and prostate gland showing subdivisions of the ductus deferens in relation to surrounding structures.

- Ureter
- Urinary bladder
- Prostatic urethra
- Prostate gland
- Ejaculatory duct
- Ductus deferens
- Ampulla of ductus deferens
- Duct of seminal gland
- Seminal gland
- Bulbo-urethral glands
- Urogenital diaphragm
Anatomy of the Male Reproductive System

• The Urethra
  • Divided to form three regions
    • Prostatic urethra
    • Membranous urethra
    • Spongy urethra
Figure 27.1 The Male Reproductive System, Part I (Part 1 of 2)

- Prostatic urethra
- Membranous urethra
- Corpus cavernosum
- Corpus spongiosum
- Spongy urethra
- Ductus deferens
- Penis
- Epididymis
- Testis
- External urethral orifice
- Scrotum
- Pubic symphysis
- Prostate gland
- Seminal gland
- Rectum
- Ureter
- Urinary bladder
- Ejaculatory duct
- Bulbo-urethral gland
- Anus
Anatomy of the Male Reproductive System

• The Accessory Glands
  • There are three glands associated with the male reproductive system
    • **Seminal glands** (or *seminal vesicles*)
    • Prostate gland
    • **Bulbo-urethral glands** (or *Cowper’s glands*)
Anatomy of the Male Reproductive System

• The Seminal Glands
  • Produce 60% of the semen
  • Produce a high concentration of fructose
  • Empty the contents into the ejaculatory duct

• The Prostate Gland
  • Prostatic secretions enter into the prostatic urethra
  • Produces 20–30% of the semen

• The Bulbo-urethral Glands
  • Paired glands located at the base of the penis
  • Contents enter into the spongy urethra
Figure 27.1 The Male Reproductive System, Part I (Part 1 of 2)
Anatomy of the Male Reproductive System

• **Semen**
  • Each ejaculate releases 2 to 5 ml of semen
  • Ejaculate material consists of:
    • **Spermatozoa**
      • 20 million to 100 million per ml
    • **Seminal fluid**
      • 60% from the seminal vesicles
      • 30% from the prostate
      • 5% from the bulbo-urethral glands
      • 5% from the epididymis
  • **Enzymes**
    • Dissolves vaginal mucus and acts as an antibiotic
Anatomy of the Male Reproductive System

• The Penis
  • Divided into three regions
    • **Root**: Attaches to the rami of the ischia
    • **Body**: Consists of erectile tissue
    • **Glans**: The expanded distal end of the penis; surrounds the external urethral orifice
Anatomy of the Male Reproductive System

• The Body of the Penis
  • Consists of three cylindrical columns of erectile tissue and blood vessels
    • Left and right lateral corporea cavernosa
      • Deep artery of the penis is in the center of this tissue
    • Corpus spongiosum
      • Consists of the spongy urethra
Figure 27.9ab The Penis

(a) Frontal section showing the structures of the penis

(b) Cross sections of the penis showing the histological relation of the urethra and three masses of erectile tissue
Anatomy of the Male Reproductive System

• Erection of the Penis
  • Parasympathetic nerves are activated
  • Smooth muscles in the arterial walls relax
  • Arterial vessels dilate
  • Arterial vessels become engorged with blood
  • Erection occurs
Anatomy of the Male Reproductive System

• Semen Release and Ejaculation
  • The sympathetic nerves cause peristaltic action in the ductus deferens, seminal glands, prostate gland, and the bulbo-urethral glands
  • Ejaculation occurs
Anatomy of the Female Reproductive System

- Overview of the Female Reproductive System
  - Ovaries
  - Fimbriae
  - Uterine tubes
  - Uterus
  - Vagina
Figure 27.10 The Female Reproductive System

- Ovarian follicle
- Ovary
- Uterine tube
- Vesicouterine pouch
- Urinary bladder
- Pubic symphysis
- Urethra
- Paraurethral glands
- Greater vestibular gland
- Clitoris
- Labium minus
- Labium majus
- Myometrium
- Perimetrium
- Endometrium
- Sigmoid colon
- Rectouterine pouch
- Fornix
- Cervix
- Vagina
- Rectum
- Anus
- Fundus of uterus
- Endometrium of uterus
- Body of uterus (myometrium)
- Probe through internal os of uterus
- Cervix of uterus
- Probe through external os of uterus
- Vagina
- Rectum
- Anus
- Suspensory ligament of ovary
- Uterine tube
- Ovary
- Urinary bladder
- Pubic symphysis
- Urethra
- External urethral orifice
- Vestibule
- Fat of mons pubis
- Labium minus
- Labium majus

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Anatomy of the Female Reproductive System

• Numerous structures aid in anchoring the ovaries, uterine tubes, and uterus
  • Broad ligament
  • Mesosalpinx
  • Mesovarium
  • Ovarian ligament
  • Suspensory ligament
  • Round ligament
  • Uterosacral ligament
Figure 27.11a The Ovaries, Uterine Tubes, and Uterus

Posterior view of the ovaries, uterine tubes, and uterus along with their supporting ligaments.

- Ovarian artery and vein
- Fimbriae
- Uterine tube
- Ovarian ligament
- Mesovarium
- Suspensory ligament
- Retractor
- Infundibulum
- Ovary
- Ureter
- Uterosacral ligament
- Broad ligament
- External os
- Cervix
- Vaginal rugae
- Vaginal wall

Posterior view of the ovaries, uterine tubes, and uterus along with their supporting ligaments.
Anatomy of the Female Reproductive System

• The Ovaries
  • Consist of:
    • Cortex
      • Gamete production occurs here
    • Medulla
Figure 27.11b The Ovaries, Uterine Tubes, and Uterus

- Uterine tube
- Medulla
- Corpus luteum
- Cortex
- Tunica albuginea
- Mesosalpinx
- Ovarian hilum
- Mesovarium
- Broad ligament
- Egg nest
- Germinal epithelium
- Mature follicle

The ovary and associated mesenteries in sectional view
Anatomy of the Female Reproductive System

- The Ovarian Cycle and Oogenesis
  - Oogenesis: the production of female gametes
  - Unlike the males, this process begins before birth
    - Gametes develop in **ovarian follicles**
    - Oogonia complete their meiotic division prior to birth
    - There are about 2 million primary oocytes
    - By puberty, only 400,000 are left
    - “Left over” primary oocytes reside in the cortex surrounded by a layer of cells constituting an entire structure called the **primordial ovarian follicle**
Anatomy of the Female Reproductive System

• The Ovarian Cycle and Oogenesis (details)
  • At puberty, the **follicle-stimulating hormone** (FSH) from the pituitary gland initiates the cycle
    • **Primordial follicles** develop into **primary follicles**
    • During this development, several layers of cells form around the follicles
      • **Zona pellucida**
      • **Granulosa cells**: release estrogen
      • **Thecal cells**: release estrogen
Anatomy of the Female Reproductive System

• The Ovarian Cycle and Oogenesis (details)
  • The primary follicles develop to form secondary follicles
  • Secondary follicles enlarge greatly due to fluid production by the follicular cells
Anatomy of the Female Reproductive System

- The Ovarian Cycle and Oogenesis (details)
  - The secondary follicles become tertiary follicles
  - This is the mature follicle (also called Graafian follicle)
  - This follicle is large enough to cause the ovarian walls to stretch
  - The tertiary follicle is preparing to ovulate the egg
Anatomy of the Female Reproductive System

• The Ovarian Cycle and Oogenesis (details)
  - **Ovulation**: gamete release
  - The follicular cells around the oocyte are now called the *corona radiata*
  - There is a rise in the concentration of the **luteinizing hormone** (LH) – this causes a weakening in the follicular wall
  - The egg is released eventually into the **uterine tube**
Figure 27.12 Histological Summary of the Ovarian Cycle

1. Formation of Primary Follicles
   - Primordial follicles
   - Granulosa cells
   - Primary follicles
   - Zona pellucida
   - Thecal cells
   - Nucleus of primary oocyte

2. Formation of Secondary Follicle
   - Thecal cells
   - Zona pellucida
   - Nucleus of primary oocyte
   - Granulosa cells

3. Formation of Tertiary Follicle
   - Antrum containing follicular fluid
   - Granulosa cells
   - Corona radiata
   - Secondary oocyte

4. Ovulation
   - Released secondary oocyte
   - Coronary radiata
   - Corpus albicans
   - Corpus luteum

5. Formation of Corpus Luteum
   - Follicular fluid
   - Secondary oocyte within corona radiata
   - Ruptured follicle wall
   - Outer surface of ovary

6. Formation of Corpus Albicans
   - Corpus luteum
Anatomy of the Female Reproductive System

• The Ovarian Cycle and Oogenesis (details)
  • After the release of the egg, the empty follicle is called a corpus luteum
  • The corpus luteum produces progesterone
  • Progesterone is used to prepare the body for pregnancy
  • If pregnancy does not occur, the corpus luteum decomposes and becomes the corpus albicans
Anatomy of the Female Reproductive System

**PLAY** ANIMATION Oogenesis

**PLAY** ANIMATION Comparison of Spermatogenesis and Oogenesis
Anatomy of the Female Reproductive System

• The Uterine Tubes
  • Consist of four regions
    • Infundibulum
    • Ampulla
    • Isthmus
    • Uterine part
Figure 27.14a The Uterine Tubes

Regions of the uterine tubes

- Isthmus
- Ampulla
- Infundibulum
- Fimbria
Anatomy of the Female Reproductive System

• Four Regions of the Uterine Tubes
  • Infundibulum
    • Has numerous fimbriae
    • Inner lining of fimbria contains cilia
  • Ampulla
  • Isthmus
  • Uterine part
    • Opens into the uterus
Anatomy of the Female Reproductive System

- The Uterus
  - Provides protection for the embryo
  - Provides nutritional support for the embryo
  - Provides a means to remove waste produced by the embryo
Anatomy of the Female Reproductive System

- Internal Anatomy of the Uterus
  - Consists of:
    - Body
    - Fundus
    - Cervix
    - External os
    - Cervical canal
    - Uterine cavity
    - Internal os
Figure 27.15a The Uterus

Posterior view of the uterus and stabilizing ligaments within the pelvic cavity.

- Ampulla
- Isthmus
- Uterine part
- Body of uterus
- Fundus of uterus
- Uterine cavity
- Body of uterus
- Uterine tube
- Ovary
- Suspensory ligament of ovary
- Ovarian artery and vein
- Mesovarium
- Ovarian ligament
- Round ligament of uterus
- Perimetrium
- Myometrium
- Endometrium
- Uterine artery and vein
- Internal os (internal orifice)
- Isthmus of uterus
- Cervical canal
- Vaginal artery
- External os (external orifice)
- Vaginal rugae
- Vagina
- See Figure 27.16
- See Figure 27.19

Posterior view of the uterus and stabilizing ligaments within the pelvic cavity.
Anatomy of the Female Reproductive System

• The Uterine Wall
  • The uterine wall consists of three layers
    • Endometrium
    • Myometrium: made of smooth muscle
    • Perimetrium
Figure 27.15a The Uterus

- Posterior view of the uterus and stabilizing ligaments within the pelvic cavity
- See Figure 27.16
- See Figure 27.19
Anatomy of the Female Reproductive System

• The Uterine Cycle
  • The uterine cycle is the **menstrual cycle**
  • Consists of three phases
    • Proliferative phase
    • Secretory phase
    • Menses
Anatomy of the Female Reproductive System

• Phases of the Uterine Cycle
  • **Proliferative phase**
    • Endometrial lining thickens preparing the body for the implantation of a fertilized egg
  • **Secretory phase**
    • Endometrial glands enlarge and blood vessels elongate
    • An egg is ready to implant (if an egg is present)
  • **Menses**
    • Constriction of blood vessels causes a loss of the excess endometrial cells
    • This is menstruation
Figure 27.17b  Histological Changes in the Uterine Cycle

Proliferative phase

UTERINE CAVITY

Uterine glands

Functional layer

ENDOMETRIUM

Basilar layer

MYOMETRIUM

Proliferative phase

LM \times 66
Secretory phase. The functional layer is now so thick that at a magnification comparable to that of part (a) or part (b) you cannot capture the entire width of the endometrium in one image.
Figure 27.17a Histological Changes in the Uterine Cycle

Perimetrium
Endometrium
Myometrium
Cervix

UTERINE CAVITY
Basilar layer of endometrium
Uterine glands
MYOMETRIUM

Menses
LM x 63
Anatomy of the Female Reproductive System

• The Vagina
  • **Cervix** projects from the uterus into the vaginal canal
  • The edges of the cervix form recesses called the **fornix**
  • The urethra, vaginal canal, and rectum are in close proximity to each other
Figure 27.10 The Female Reproductive System (Part 1 of 2)

- Ovarian follicle
- Ovary
- Uterine tube
- Vesicouterine pouch
- Urinary bladder
- Pubic symphysis
- Urethra
- Paraurethral glands
- Greater vestibular gland
- Clitoris
- Labium minus
- Labium majus
- Myometrium
- Perimetrium
- Endometrium
- Sigmoid colon
- Rectouterine pouch
- Fornix
- Cervix
- Vagina
- Rectum
- Anus
- Uterus
Anatomy of the Female Reproductive System

• The External Genitalia
  • Vulva
  • Vestibule
  • Labia minora
  • Clitoris
  • Prepuce
  • Labia majora
  • Mons pubis
  • Hymen (when present)
Figure 27.20a The Female External Genitalia

An inferior view of the female perineum

- Mons pubis
- Prepucce of clitoris
- Glans of clitoris
- Urethral opening
- Vestibule
- Labia minora
- Hymen (torn)
- Vaginal entrance
- Labia majora
- Anus

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Anatomy of the Female Reproductive System

• The Mammary Glands
  • Consist of:
    • **Lobes of mammary glands**: milk leaves the lobes
    • **Lactiferous ducts**: ducts lead to the nipple
    • Nipple
    • Areola
    • Suspensory ligaments
Figure 27.21a The Mammary Glands

- **Pectoralis major muscle**
- **Pectoral fat pad**
- **Suspensory ligaments**
- **Lobes of mammary glands**
- **Lactiferous duct**
- **Areola**
- **Nipple**
- **Lactiferous sinus**

**Gross anatomy of the breast**
Menopause

Decline in estrogen levels results in:

- Reduced size of the uterus
- Reduced size of the breasts
- Thinning of the vaginal walls
- Weakening of the supportive tissues of the reproductive organs
- Osteoporosis
- Hot flashes

Typically occurs at age 45–55
Aging and the Reproductive System

• The Male Climacteric
  • Testosterone levels begin to decline (not as rapidly as estrogen however)
  • Occurs gradually between ages 50 and 60
  • Reduction in sexual activity