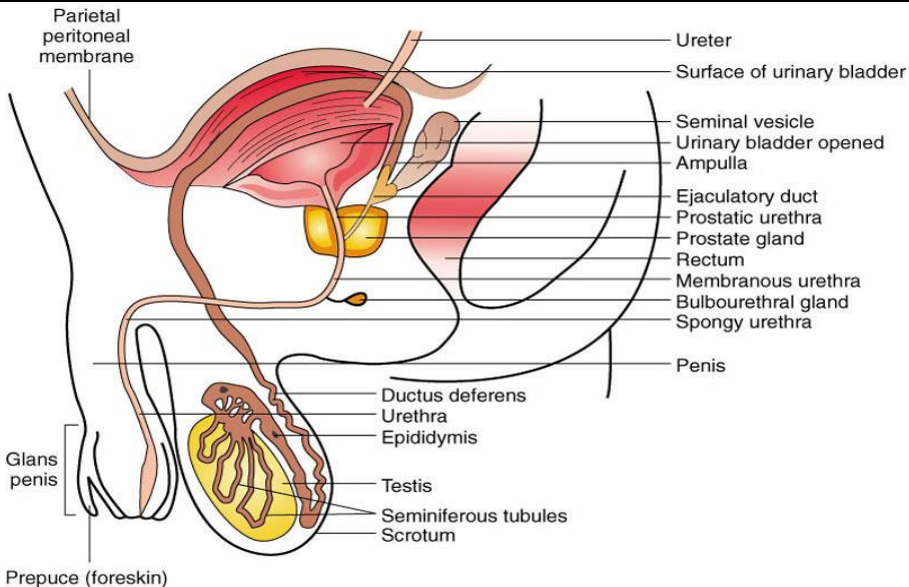
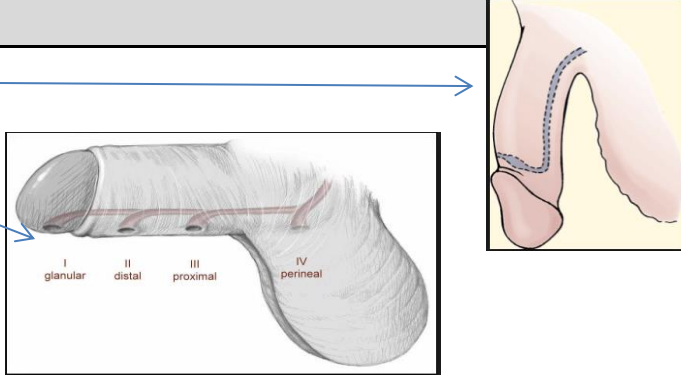
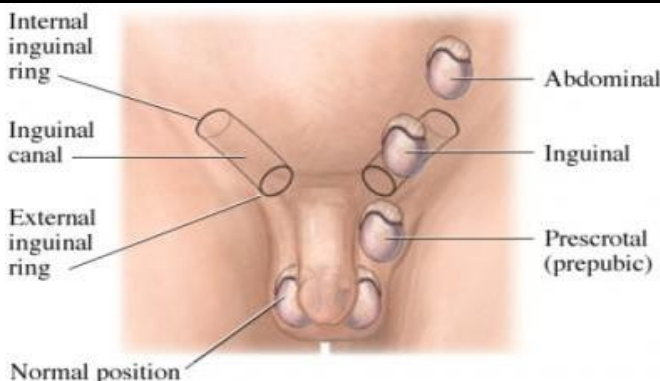


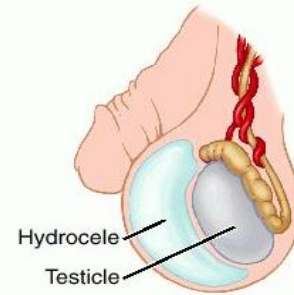
## BIOS 2015 ... CHAPTER 19- Reproductive System Disorders

Page	Note
	<b>Male Reproductive System</b>
	<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p><b>Testes</b>—spermatogenesis  <b>Epididymis</b>—maturation of sperm  <b>Vas deferens</b>—transport of sperm to urethra  <b>Seminal vesicles</b>—secretion to nourish sperm  <b>Prostate gland</b>—secretions to balance pH  <b>Cowper glands</b> (bulbourethral)—secretes alkaline mucus  <b>Penis</b>—ejaculation of semen</p> </div> <div style="width: 65%;">  <p style="text-align: center; font-size: small;">Copyright © 2014, 2011, 2006, 2002, 1997 by Saunders, an imprint of Elsevier Inc.</p> </div> </div>
	<p><b>Male hormones</b>          Follicle-stimulating hormone (FSH)—initiates spermatogenesis          Luteinizing hormone (LH)—stimulates testosterone production          Testosterone—maturation of sperm, sex characteristics, protein metabolism, muscle development</p>
	<b>Congenital Abnormalities of Penis:</b>
	<div style="display: flex; align-items: flex-start;"> <div style="width: 45%; padding-right: 10px;"> <p><b>Epispadias</b>—urethral opening on dorsal or upper surface of the penis  <b>Hypospadias</b>—urethral opening on ventral surface (underside) of the penis            Either condition may result in incontinence or infection.            Treatment—surgical reconstruction</p> </div> <div style="width: 55%;">  </div> </div>
	<b>Disorders of the testes and scrotum:</b>
	<div style="display: flex; align-items: flex-start;"> <div style="width: 45%; padding-right: 10px;"> <p><b>Cryptorchidism</b>—testis fails to descend into scrotum properly  <b>Ectopic testis</b> — testis positioned outside of scrotum</p> <p>Can cause degeneration of seminiferous tubules and spermatogenesis is impaired</p> <p><b>Risk of testicular cancer increased significantly if treatment not done by age 5 years</b></p> </div> <div style="width: 55%;">  <div style="border: 1px solid black; padding: 5px; margin-top: 10px; width: fit-content;">             The testes normally develop in the abdomen and descend into the scrotum           </div> </div> </div>

**Hydrocele**—occurs when excessive fluid collects in space between layers of the tunica vaginalis of the scrotum

May occur as congenital defect in newborn

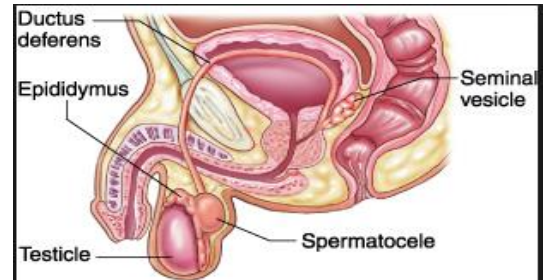
May be acquired as result of injury, infection, tumor



**Spermatocele**—cyst containing fluid and sperm that develops between the testis and the epididymis

May be related to developmental abnormality

Treatment is surgical removal

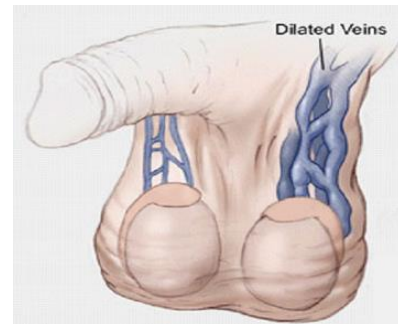


**Varicocele**—a dilated vein in the spermatic cord

Lack of valves allows backflow in veins; leads to increased pressure and dilation

Causes impaired blood flow to testes and decreased spermatogenesis

Requires surgery



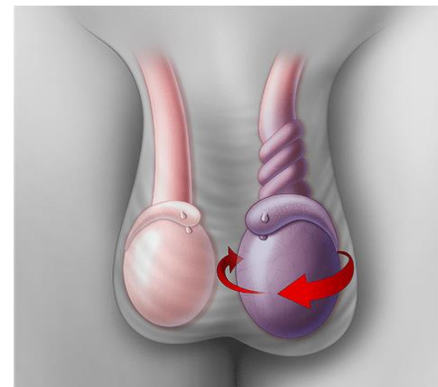
**Torsion of the testes**—testes rotate on spermatic cord, compressing arteries and veins.

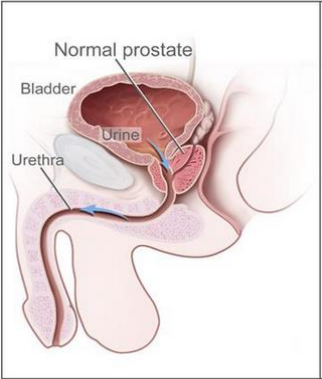
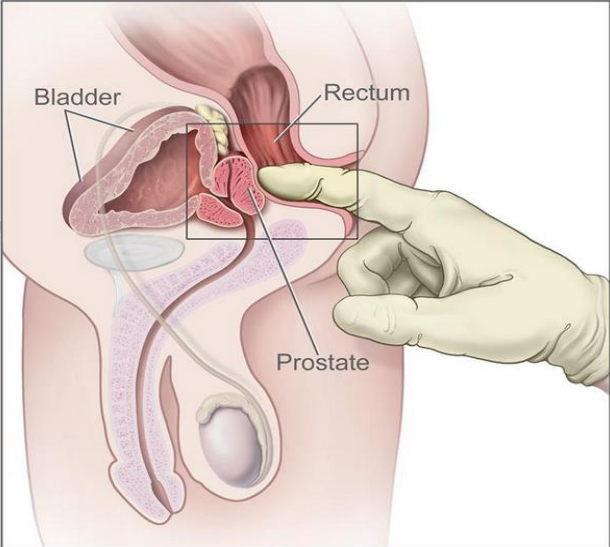
Ischemia develops, scrotum swells

Testis may be infarcted if torsion is not reduced

Can occur spontaneously or following trauma

Treated manually and surgically



	<p><b>Prostatitis:</b> infection or inflammation of the prostate gland</p> <p><b>Four recognized categories</b></p> <p><b>Acute bacterial:</b></p> <ul style="list-style-type: none"> <li>- gland is tender and swollen, urine and secretions contain bacteria</li> <li>- Acute bacterial infection is caused primarily by <i>Escherichia coli</i> and sometimes by <i>Pseudomonas</i>, <i>Proteus</i>, or <i>Streptococcus faecalis</i>.</li> <li>- bacteria are opportunistic , from normal flora of the gut.</li> </ul> <p><b>Chronic bacterial:</b></p> <ul style="list-style-type: none"> <li>- gland only slightly enlarged, dysuria, frequency, urgency.</li> <li>- repeated infection by <i>E. coli</i>.</li> </ul> <p><b>Nonbacterial:</b> urine and secretions contain large numbers of leukocytes</p>	<div data-bbox="1109 113 1429 489">  </div> <div data-bbox="1052 506 1498 793"> <p><b>Occurs in:</b></p> <ul style="list-style-type: none"> <li>- Young men with UTIs</li> <li>- Older men with prostatic hypertrophy</li> <li>- In association with STDs</li> <li>- With instrumentation such as catheterization</li> <li>- Through bacteremia</li> </ul> </div>
	<p><b>Signs and symptoms of prostatitis:</b></p> <p>Both acute and chronic forms manifested by dysuria, urinary frequency, and urgency</p> <p>Decreased urinary stream</p> <p>Acute form includes fever and chills</p> <p>Lower back pain</p> <p>Leukocytosis</p> <p>Abdominal discomfort</p> <p>Systemic signs include fever, malaise,</p> <p>Anorexia</p> <p>Muscle aches</p>	
	<p><b>Treatment for prostatitis:</b> Antibiotics (and in non-bacterial add anti-inflammatory drug)</p>	
	<p><b>Balanitis</b> - infection of the glans penis (area around head of penis).</p>	
	<p>- caused by the fungus <i>Candida albicans</i> (agent in yeast infections in women)</p>	
	<p>- can be sexually transmitted.</p>	
	<p><b>Benign Prostatic Hypertrophy (BPH)</b></p>	
	<p>Occurs in up to 50% of men &gt; 65 years</p> <p>Hyperplasia of prostatic tissue</p> <p>Compression of urethra and urinary obstruction</p> <p>Related to estrogen–testosterone imbalance</p> <p>Does not predispose to prostatic carcinoma</p> <p>Enlarged gland palpated on digital rectal examination</p> <p>Leads to frequent infections</p> <p>Continued obstruction causes distended bladder, dilated ureters, hydronephrosis, and renal failure if untreated.</p>	<div data-bbox="841 1344 1448 1887">  </div>

<b>Benign Prostatic Hypertrophy (BPH)</b>	
	<p><b>Signs and symptoms</b>  Obstructed urinary flow  <b>Hesitancy</b> in starting flow  <b>Dribbling</b>  <b>Decreased flow strength</b>  <b>Increased frequency and urgency</b>  <b>Nocturia</b></p>
<b>Treatment for BPH:</b> Drugs that slow enlargement and relax smooth muscle - and - Surgery	
<b>Prostate Cancer</b>	
	<p><b>Most common cancer in men &gt; 50 years</b>  Third leading cause of cancer death in men  <b>One in six men affected</b>  Most are adenocarcinomas arising near surface of gland  The more undifferentiated the tumor, the more aggressive  Many tumors are androgen-dependent.</p> <p>Both invasive and metastatic  Some forms are highly aggressive but others are not.  5% to 10% caused by inherited mutations  Other causes—high androgen levels, increased insulin-like growth factor, history of recurrent prostatitis</p> <p><b><u>Signs and symptoms</u></b>  <b>Hard nodule felt on periphery of gland</b>  <b>Hesitancy in urination, Decreased urine stream, Frequent urination</b>  <b>Recurrent UTI</b></p> <p><b><u>Diagnosis</u></b>  <b>Serum markers , Prostate-specific antigen (PSA), Prostatic acid phosphatase</b>  Ultrasonography  <b>Biopsy</b>  Bone scans to detect metastases</p> <p><b><u>Treatment</u></b>  <b>Surgery</b> (radical prostatectomy)  <b>Radiation:</b> external or implanted pellets  If androgen-sensitive, then orchiectomy is effective, as well as antitestosterone</p>
<b>Testicular Cancer</b>	
	<p>Most testicular tumors are malignant.  Most common solid tumor cancer in young men, 1 in 300 affected  Number of cases increasing  <b>Testicular self-examination is essential for early detection.</b></p> <p><b><u>Signs and symptoms</u></b>  Tumors are hard, painless, usually unilateral  Testes may be enlarged or feel heavy.  Dull aching scrotum and pelvis  Hydrocele or epididymitis may develop.  Gynecomastia occurs if the tumor is hormone- secreting.</p>

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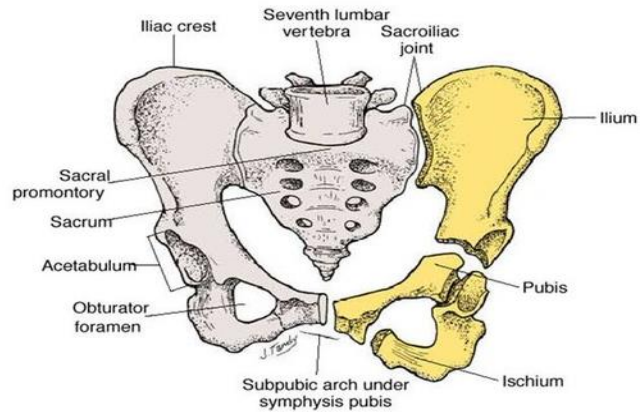


# Female Reproductive System

## Review Anatomy

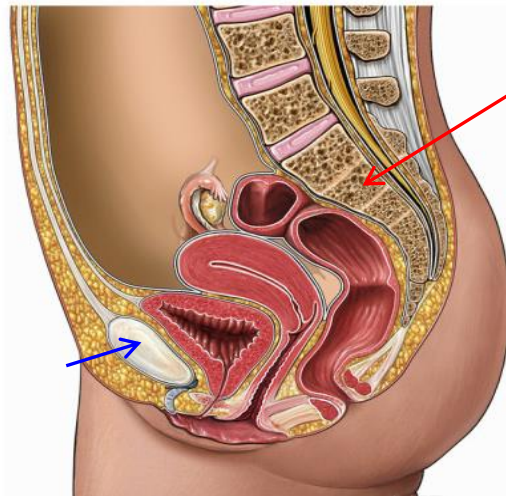
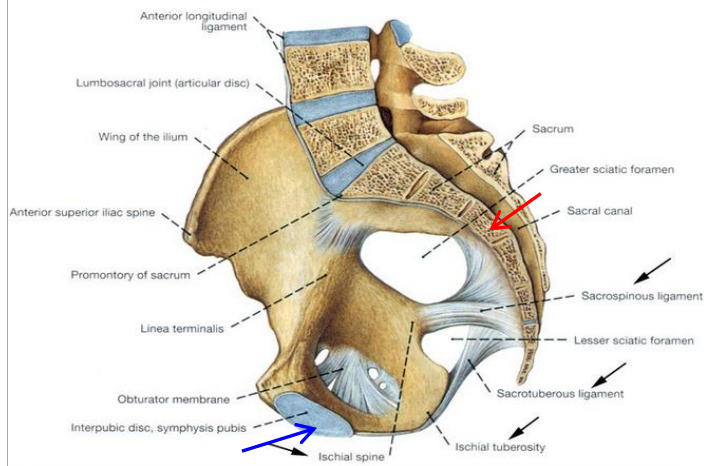


In the adult, the pelvis is a fusion of bones seen in the diagram on the right.

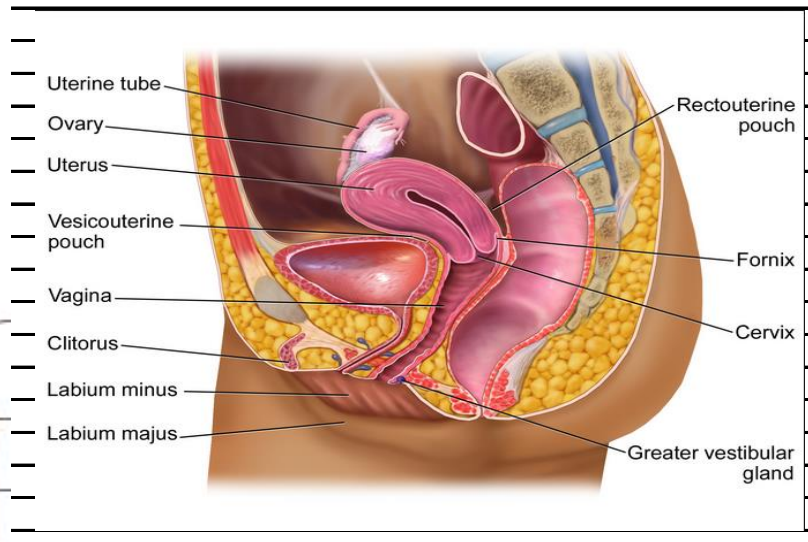
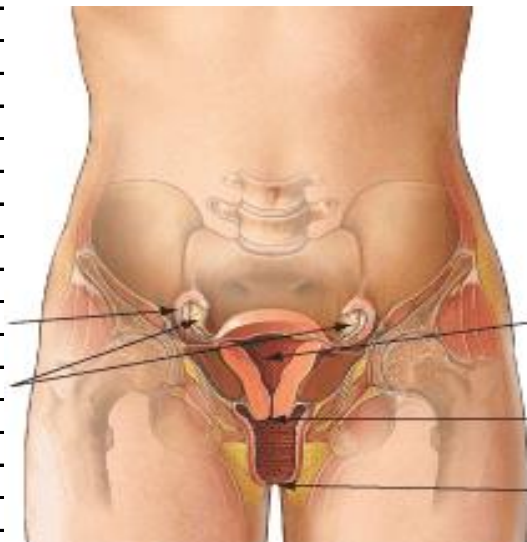


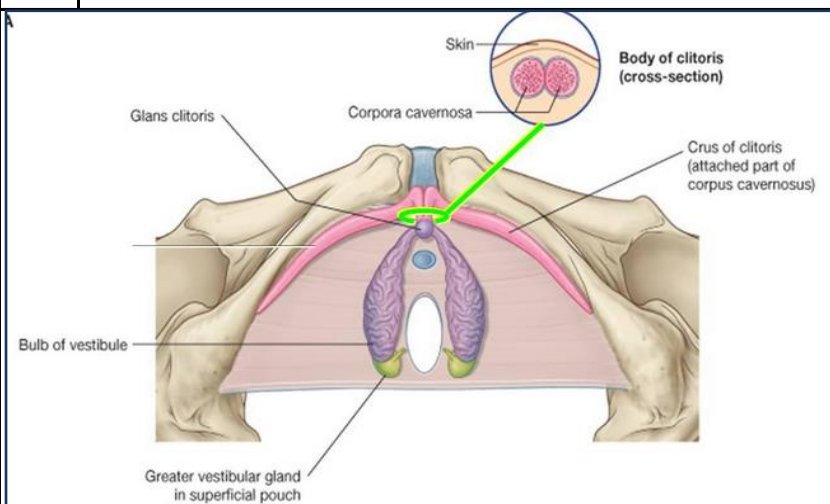
Half of this pelvis shows an exploded view so that you can visualize the individual bones and appreciate why the mid saggital section view shows only a small oval called the pubic symphysis (where the right and left pubic bones join)

## Pelvis and Ligaments, Vertical Cross Section, Female



Bony limits of the pelvis seen in "midsagittal section" show the pubic symphysis (blue arrows) anterior and the sacrum (red arrows) posterior. All elements of the urinary, reproductive, and intestinal systems pass through this bony outlet.





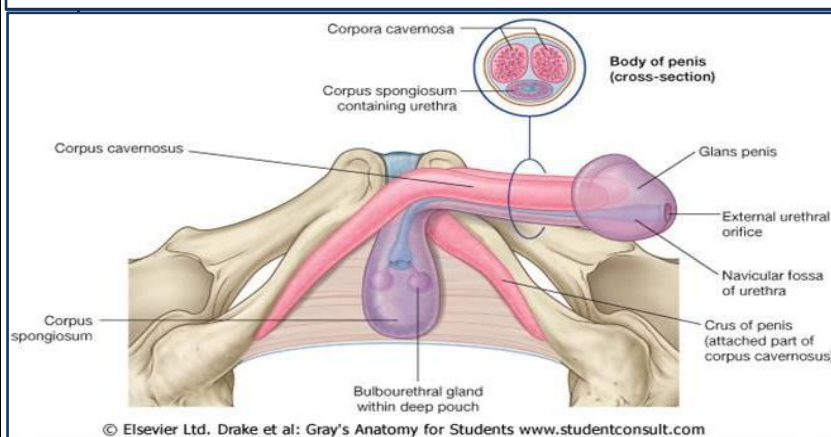
### **Clitoris compared with Penis**

These diagrams detail the complex anatomy of the clitoris and show that developmentally similar parts are present in the penis.

#### **Just remember:**

**1. That the clitoral anatomy is mostly internal and that the part visible in the vulva comprises only a small part of the clitoris.**

**2. Erectile tissue in the clitoris has a similar developmental origin as erectile tissue in the penis.**



**Uterus**—muscular organ within which fertilized ovum may implant and develop

**Cervix**—opening into uterus and neck of the uterus

External os

Opening from vagina filled with thick mucus

Prevents vaginal flora from ascending into the uterus

Internal os

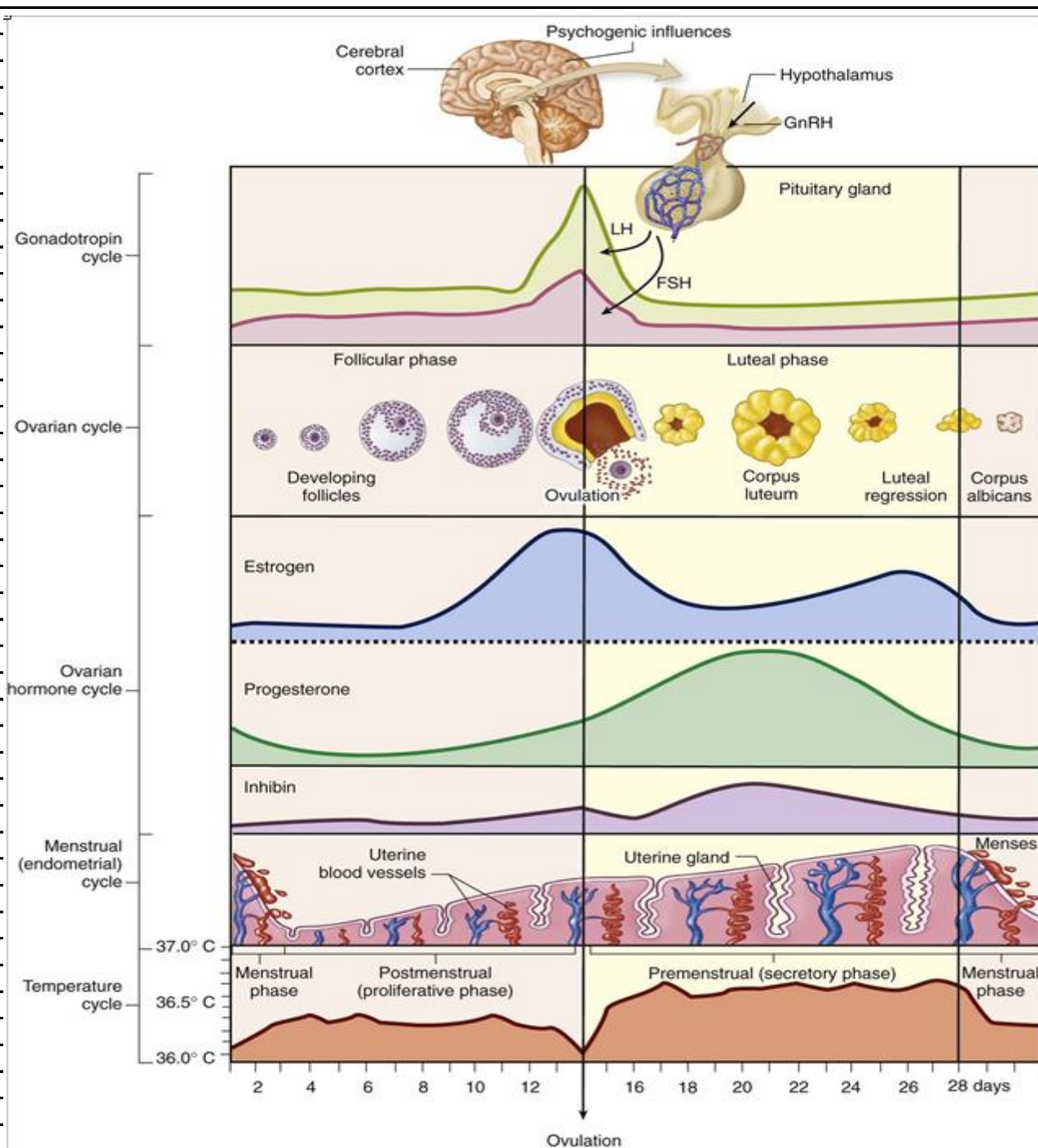
**Fallopian tubes** (oviducts)—tubes from ovaries to uterus

**Ovaries**—produce ova and estrogen and progesterone hormones

#### **Breasts**

Glands produce colostrum and milk for newborn

Adipose tissue



Cycle may be from 21 to 45 days

Cycle consists of:

Menstruation (days 1 to 5)

Endometrial proliferation and production of estrogen (days vary)

Maturation of ovarian follicle

Release of LH, causing ovulation

Follicle (from which ovum erupted) becomes the corpus luteum, produces progesterone

Vascularization of endometrium in preparation for implantation (12 to 14 days prior to onset of next menstruation)

If implantation does not occur:

Corpus luteum atrophies

Uterine muscle contracts → ischemia

Endometrium degenerates



**For the menstrual cycle, know the order of events below:**

Menstruation > Increasing Estrogen - Endometrium proliferates > FSH -LH spikes > Ovulation > Estrogen wanes > Progesterone rises (from corpus luteum) > if no pregnancy, progesterone wanes and menstruation begins.

**Structural abnormalities:**

**Normal position of uterus**

Slightly anteverted and anteфлекed

Cervix downward and posterior

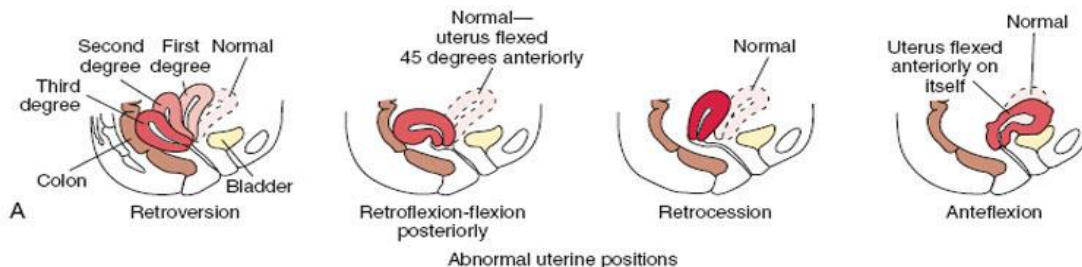
**Retroflexion of uterus**

Uterus tipped posteriorly

May be excessively curved or bent

Marked retroversion may cause back pain, dysmenorrhea, dyspareunia

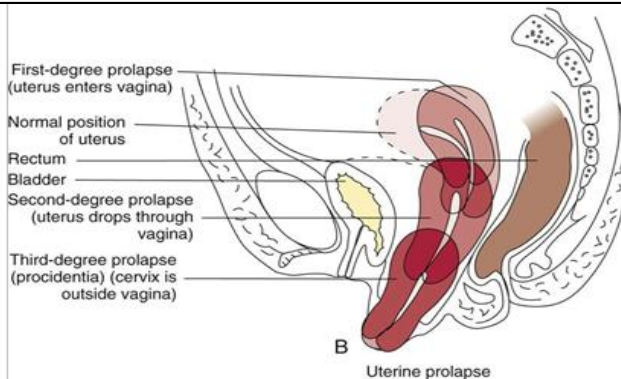
In some cases, infertility may occur.



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**Uterine Prolapse:**

Uterus drops into vagina and may protrude from vagina in worst cases.

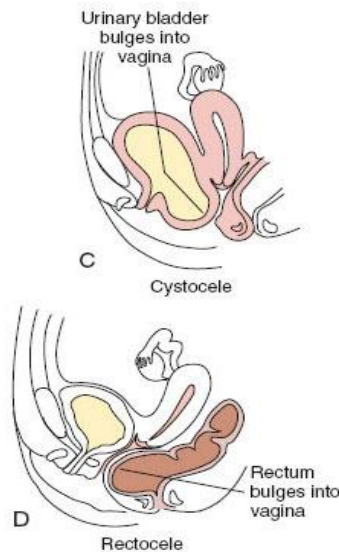


**Rectocele**

Protrusion of the rectum into the posterior vagina  
May cause constipation and pain

**Cystocele**

Protrusion of bladder into the anterior vagina  
May cause UTIs  
If severe, conditions are treated surgically to increase the support of the pelvic ligaments.



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## **Menstrual abnormalities**

### **Amenorrhea** (absence of menstruation)

- May be primary or secondary
- Primary form may be genetic.
- Secondary form usually hormonal imbalance

### **Dysmenorrhea:** Painful menstruation

### **Menorrhagia:**

- Increased amount and duration of flow

### **Metrorrhagia**

- Bleeding between cycles

### **Polymenorrhea**

- Short cycles of less than 3 weeks

### **Oligomenorrhea**

- Long cycles of more than 6 weeks

## **Endometriosis**

Endometrial tissue occurs outside the uterus.

Ectopic endometrium responds to cyclical hormone changes.

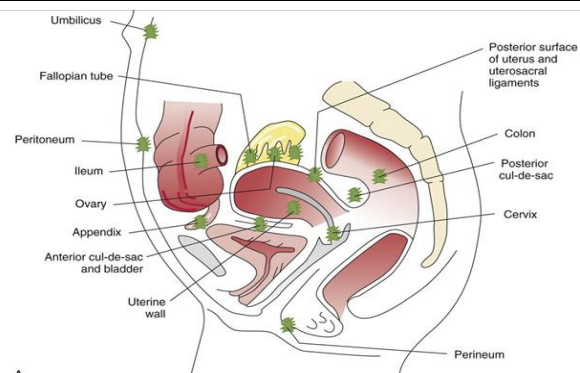
Bleeding leads to inflammation and pain.

Fibrous tissue may cause adhesions and obstructions of the involved structures.

Cause has not been established but thought to be congenital in some cases

### **Treatment**

- Hormonal suppression



## **Candidiasis**

Form of vaginitis that is **not sexually transmitted**

### **Caused by the fungus Candida albicans**

Opportunistic infection by normal flora of vagina, seen in:

- Antibiotic therapy (Augmentin causes it)
- Pregnancy
- Diabetes
- Reduced host resistance

Candidiasis causes red and swollen, intensely pruritic mucous membranes and a thick, white, curdlike discharge.

May extend to vulvar tissues

Use topical antifungal treatment

## **Pelvic Inflammatory Disease**

Infection of uterus, fallopian tubes, and/or ovaries

May be acute or chronic

**Infection usually originates as an ascending infection from lower reproductive tract.**

**Most infections arise from sexually transmitted diseases, nonsterile abortions, or childbirth.**

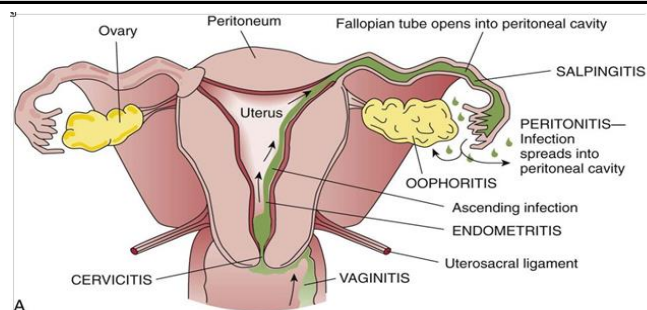
**Scarring of tubes increases risk of infertility and ectopic pregnancy.**

Potential acute complications

**Peritonitis**

**Pelvic abscesses**

**Septic shock**



	<b>Benign Tumors</b>
	<p>Leiomyoma (fibroids): benign tumor of the myometrium</p> <p>Ovarian Cysts: small cysts, many are self limited.</p> <p>Polycystic ovarian disease: Absence of ovulation and infertility Amenorrhea and Hirsutism</p> <p>Fibrocystic breast disease Includes a broad range of breast changes and increased density of breast tissue Cyclic occurrence of nodules or masses in breast tissue</p>
	<b>Malignant Tumors</b>
	<p><b>Carcinoma of the breast</b> -Incidence increases after age 20 years -Most cases in women between ages 50 and 69 years -Metastasis occurs via lymph nodes early in the course of the disease.</p> <p><b>Predisposing factors</b> -First-degree relative with the disease -Longer and higher exposure to estrogen -Nulliparous or late first pregnancy -Lack of exercise, Smoking, High-fat diet</p> <p><b>Diagnosis:</b> Mamogram and needle biopsy <b>Treatment:</b> Surgery, chemotherapy, radiation. -Aggressiveness of surgery depends on stage of disease. <b>Prognosis:</b> Related to size on presentation (self exam is critical to early detection).</p>
	<b>Carcinoma of the Cervix</b>
	<p>Most cases of cervical cancer are caused by human papillomavirus (HPV) infection, a sexually transmitted virus. Vaccines now exist against the causative strains of HPV. Routine Pap smears of cervical cells are important in identifying early, treatable stages of the disease: By age 20 years or in the year that sexual intercourse begins At intervals, as advised by health care worker</p>
	<b>Ovarian Cancer</b>
	<p><b>No reliable screening available</b> Large mass detected by pelvic examination Transvaginal ultrasound <b>Considered a silent tumor</b> <b>Few diagnosed in the early stage</b> Research is ongoing to identify markers for serum diagnosis. Different types—vary in aggressiveness</p>
	<p><b>Risk factors</b> - <b>Obesity</b> - <b>BRCA1 gene</b> - <b>Early menarche</b> - <b>Nulliparous or late first pregnancy</b> - <b>Use of fertility drugs</b> Oral contraceptives containing progesterone are somewhat protective. Surgery and chemotherapy are usual treatments</p>
	<b>Infertility</b>

	<p>Cause may be a female condition, male condition, or a combination of both</p> <p>Associated with hormonal imbalances</p> <p>Age of parents</p> <p>Structural abnormalities</p> <p>Infections</p> <p>Chemotherapy, Workplace toxins, Other environmental factors</p> <p>Idiopathic</p>
	<b>Sexually Transmitted Disease</b>
	<b>Chlamydia trachomatis</b>
	- males: nonspecific urethritis, epididymitis
	- females: often asymptomatic till PID or Infertility
	<b>Neisseria gonorrhoeae</b>
	- cause of gonorrhea, painful urination in males, frequently asymptomatic in females
	- PID and infertility are serious complications.
	<b>Treponema pallidum</b>
	- cause of syphilis (also called lues).
	- primary ulcer, painless (chancre); secondary flu and rash; tertiary end organ damage (dementia, blindness, motor disabilities).
	<b>Herpes Simplex</b>
	HSV-1 and HSV-2
	Acute lesion is a blister or group of small blisters leading to very painful ulcers.
	Virus is maintained in the nervous system (dorsal root ganglia).
	Reactivated by stress, illness, and menstruation.
	Lifelong infection, no permanent cure.
	<b>Condylomata acuminata</b>
	- genital warts caused by HPV.
	- can predispose to cervical and vulvar cancer.
	<b>Trichomonas vaginalis</b>
	- protozoan
	- usually asymptomatic in men
	- intense itching and foul smelling vaginal discharge in women
	- both partners must be treated.



