GENITO URINARY SYSTEM

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SYNOPSIS

- GENERAL TERMS
- STRUCTURE & FUNCTIONS OF URINARY SYSTEM
- PATHOLOGY
- DIAGNOSTIC TESTS & PROCEDURES
- MEDICAL TERMINOLOGIES
- ABBREVIATIONS

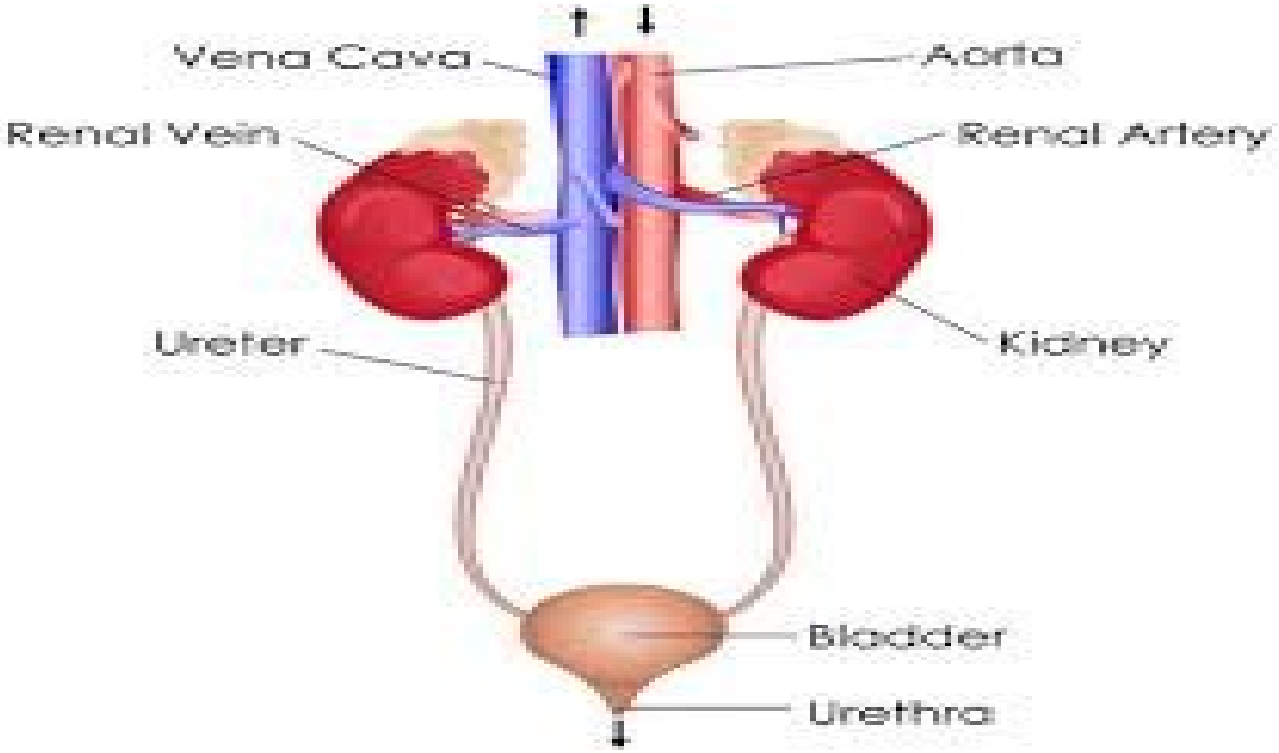
GENERAL TERMS

- **UROLOGY**
- a branch of medicine that focuses on medical conditions of the male and female urinary tract systems
- **UROLOGIST**
- Urologists diagnose and treat diseases of the urinary tract in both men and women.
- **NEPHROLOGY**
- the adult and pediatric study of the kidneys and its diseases.

GENERAL TERMS

- **NEPHROLOGIST**
- a medical doctor who specializes in diagnosing and treating kidney conditions.
- **ANDROLOGY**
- the specialty of medical science that deals with male reproductive functions under physiological and pathological conditions
- **ANDROLOGIST**
- The physicians who specialize in treating men's reproductive-related issues are known as Andrologists

STRUCTURE & FUNCTIONS OF URINARY SYSTEM



STRUCTURE & FUNCTIONS OF URINARY SYSTEM

- Two kidneys. This pair of purplish-brown organs is located below the ribs toward the middle of the back.
- Their function is to:

- Remove waste products and drugs from the body

- Balance the body's fluids

- Release hormones to regulate blood pressure

- Control production of red blood cells

STRUCTURE & FUNCTIONS OF URINARY SYSTEM

- **Two ureters :**
- These narrow tubes carry urine from the kidneys to the bladder. Muscles in the ureter walls continually tighten and relax forcing urine downward, away from the kidneys.
- **Bladder:**
- This triangle-shaped, hollow organ is located in the lower abdomen.
- **Urethra:**
- This tube allows urine to pass outside the body.

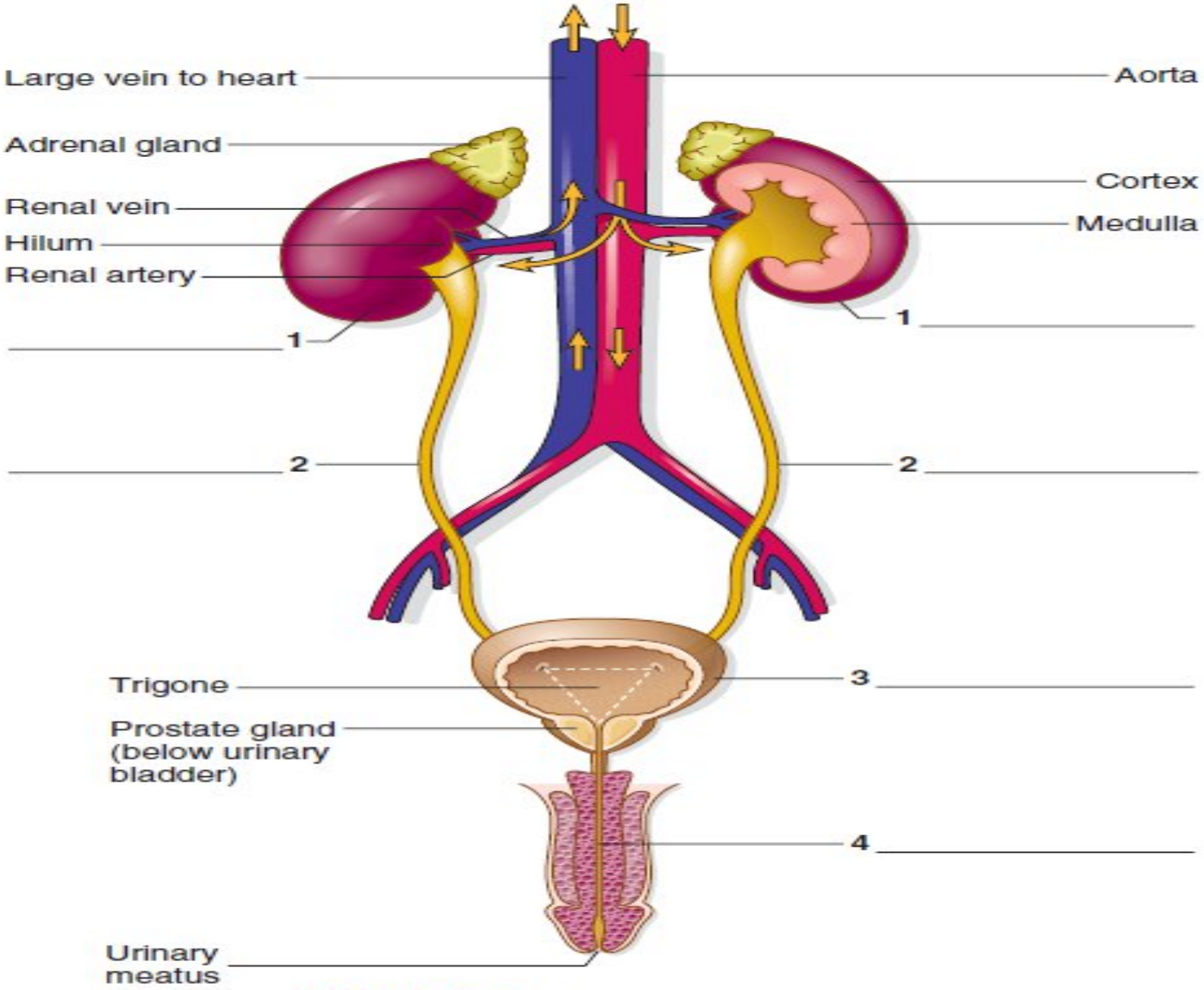


FIGURE 7-1 Male urinary system.

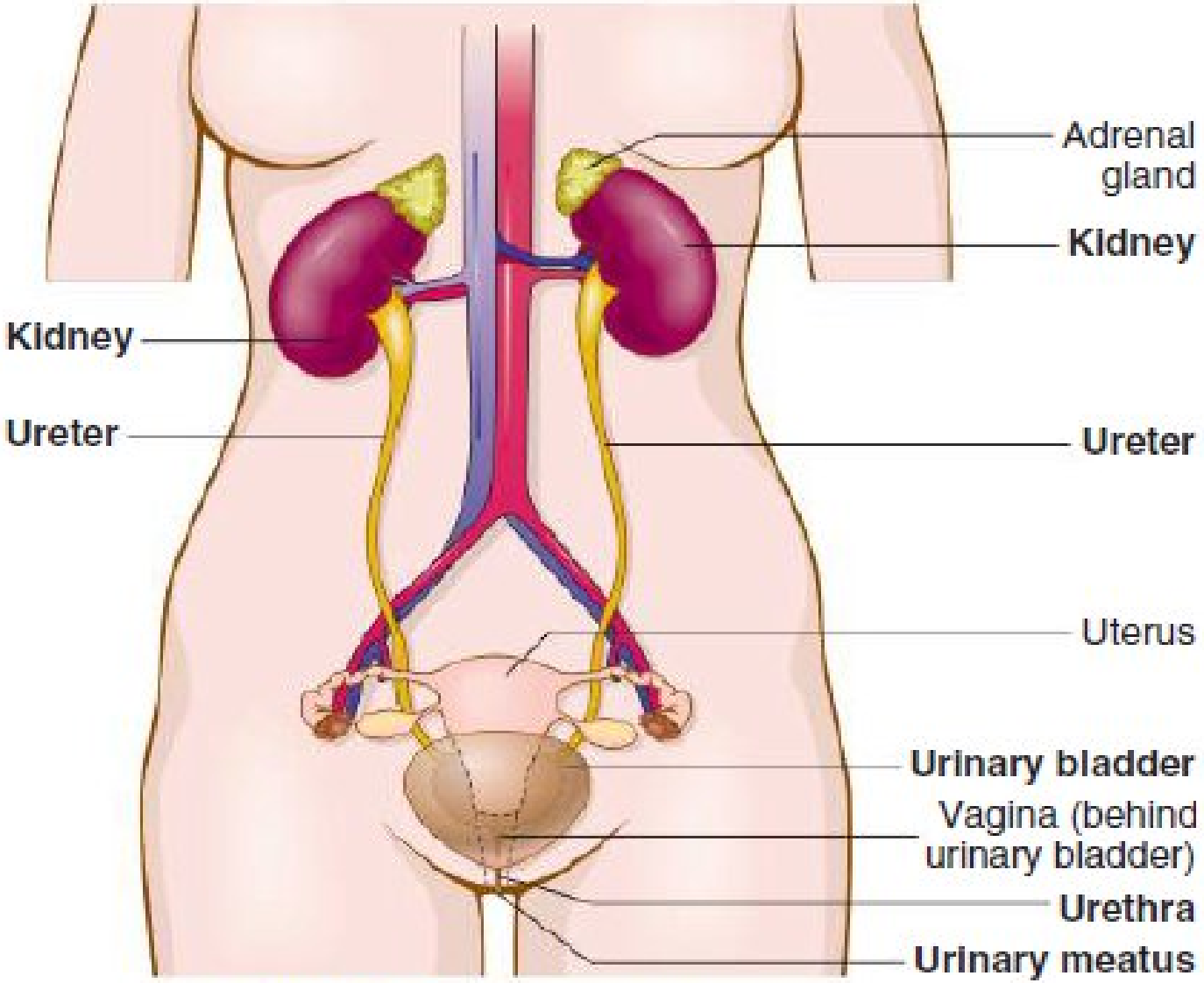


FIGURE 7-2 Female urinary system.

KIDNEY

- Each kidney is surrounded by a renal fat pad that protects the kidney from being jarred.

Within the fat pad, a layer of connective tissue called the renal capsule surrounds each kidney

- The renal artery carries blood containing waste products to each of the kidneys, where these waste products are removed by filtration.

Cleansed blood leaves each kidney through a renal vein. • These vessels enter and exit the kidney at the renal hilum.

- The hilum opens into the renal sinus, a cavity containing connective tissue and fat

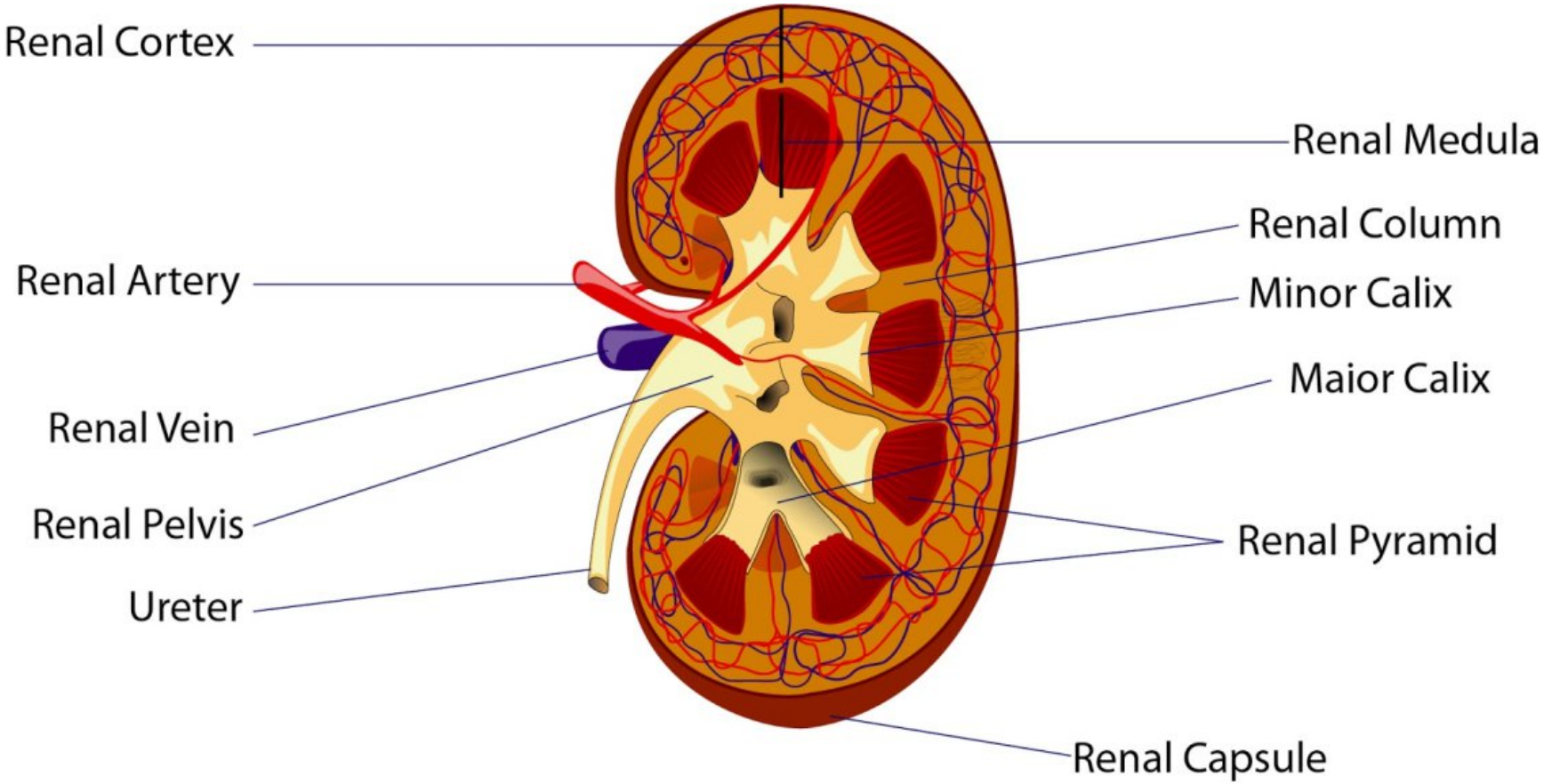
- Surrounding the renal sinus is the renal medulla
- • The renal cortex - outermost portion of the kidney. Within the medulla are Cone-shaped structures called
- renal pyramids.

• The tips of these pyramids point toward the renal sinus and a funnel-shaped structure called a calyx surrounds each tip.

• These calyces join together to form a larger funnel called the renal pelvis.

- • The renal pelvis then narrows to form the ureter.

KIDNEY


Renal Cortex
Renal Medula
Renal Column
Renal Artery
Minor Calix
Maior Calix
Renal Vein
Renal Pelvis
Renal Pyramid
Ureter
Renal Capsule

- Urine travels from the pyramids through the calyces and renal
- pelvis and into the ureters where it is carried to the urinary
- bladder.
- The urinary bladder is an expandable reservoir for urine.
- When the bladder holds approximately 200 to 300 mL of urine, the urge to urinate occurs.
- During micturition (voiding), the walls of the bladder contract and the urethral sphincter relaxes, causing urine to be expelled from the bladder
- Urine travels through the urethra and exits the body at the urethral meatus
- • In females the urethra is approximately 4 cm long
- • In males, this tube averages about 20 cm in length, as it extends the length of the penis

PHYSIOLOGY: HOW THE KIDNEYS PRODUCE URINE

- Blood passes through the many glomeruli
- The thin walls of each glomerulus (the filter) permit water, salts, sugar, and urea (with other nitrogenous wastes such as creatinine and uric acid).
- These materials collect in a tiny, cup-like structure, a glomerular (Bowman) capsule that surrounds each glomerulus.
- The walls of the glomeruli prevent large substances, such as proteins and blood cells, from filtering into the capsule.
- These substances remain in the blood and normally do not appear in urine.

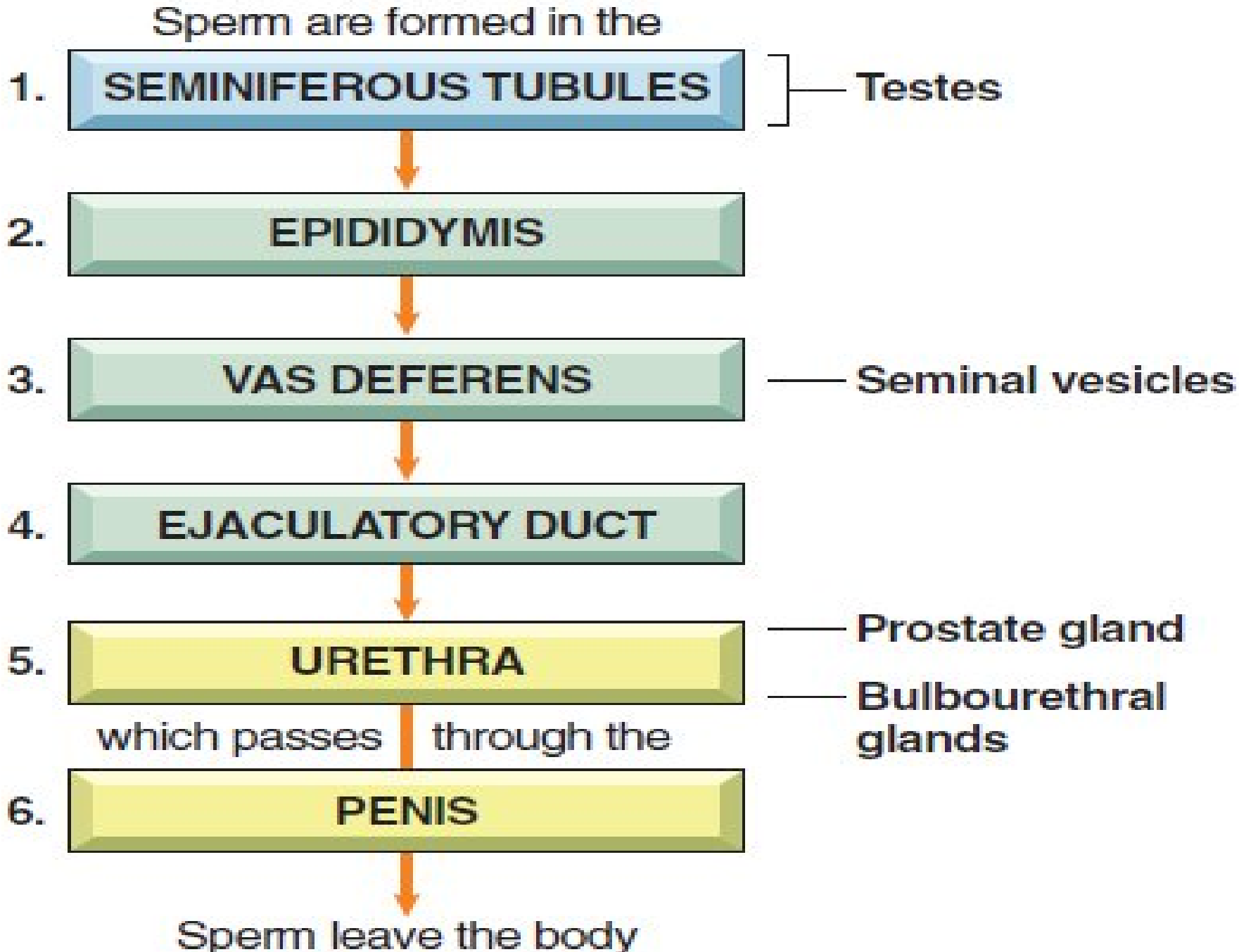
- After glomerular capsule
- Renal tubule - water, sugar, salts, urea, and other wastes pass through tiny capillaries surrounding each tubule returns to blood stream (reabsorption)
- The final process in the formation of urine is secretion of some substances from the bloodstream into the renal tubule
- Each renal tubule - containing urine (95% water and 5% urea, creatinine, salts, acids, and drugs), ends in a larger collecting tubule

STRUCTURE OF THE MALE REPRODUCTIVE SYSTEM

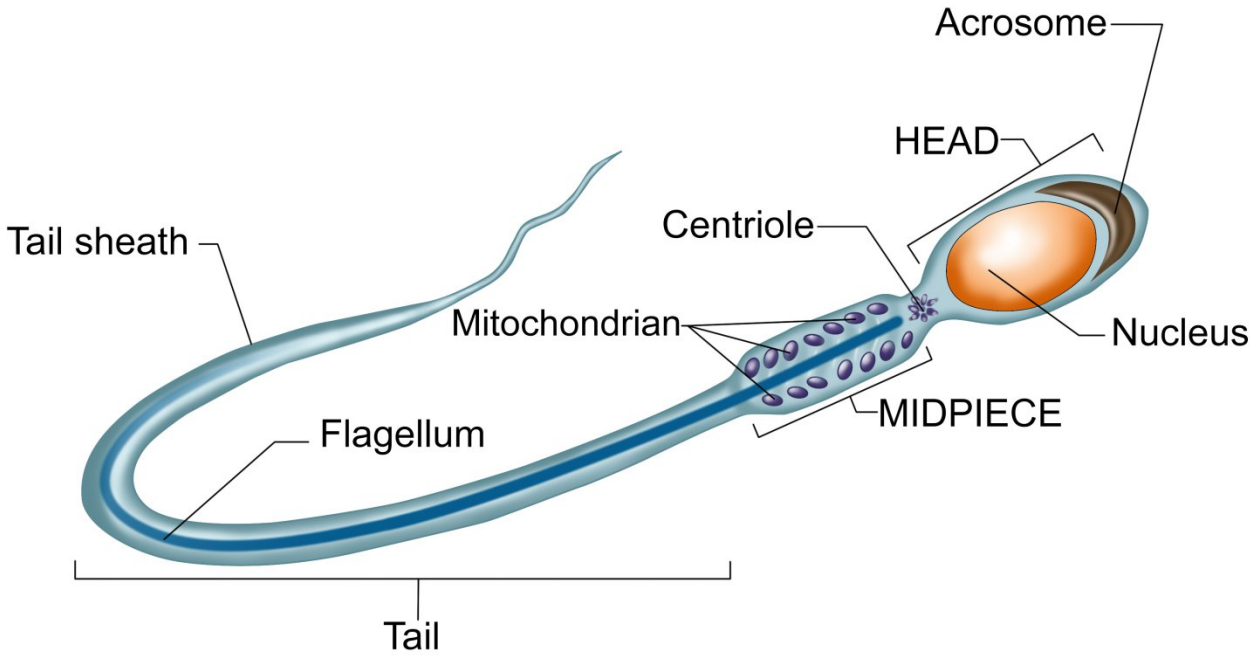
- spermatozoon is a male sex cell
- The purpose of the male reproductive system is to create spermatozoa (sperm), transport these sperm through the male reproductive channels, and keep the sperm viable (capable of living).
- The scrotum is an external sac - composed of skin externally - each containing a TESTIS internally
- The testes are filled with tightly coiled seminiferous tubules that produce sperm.
- A comma-shaped structure called the epididymis is connected to the posterior surface of each testis.

- Sperm travel from the seminiferous tubules to the epididymis, where the sperm reach maturation
- The epididymis narrows to form the vas deferens (ductus deferens), which extends into the abdominal cavity.
- The vas deferens crosses the top and continues down the posterior surface of the bladder. At this point the vas deferens joins the seminal vesicles to form the ejaculatory duct
- Seminal vesicles provide fluid that contains special nutrients to maintain the viability of sperm. This fluid constitutes approximately 60% of the fluid ejaculated during intercourse.

- The ejaculatory duct opens into the urethra near the prostate gland.
- The prostate gland secretes an alkaline substance that protects the sperm from the acidic environment found in the male urethra and the female vagina.
- A duct from the prostate gland also opens into the urethra. Inferior to the prostate are two pea_x0002_sized bulbourethral glands (Cowper glands) that create this alkaline substance


Sperm are formed in the
1. SEMINIFEROUS TUBULES
Testes
2. EPIDIDYMIS
3. VAS DEFERENS
Seminal vesicles
4. EJACULATORY DUCT
5. URETHRA
Prostate gland
Bulbourethral glands
which passes through the
6. PENIS
Sperm leave the body

STRUCTURE OF A SPERM



Condition or Disease	Description
anuria	An inability to produce urine. Defined as voiding less than 100 mL a day in adults.
balanoposthitis	Inflammation of the glans penis and foreskin.
benign prostatic hyperplasia (BPH)	Enlargement of the prostate gland causing varying degrees of obstruction of the bladder outlet.
bladder cancer	A malignancy in the urinary bladder.
chyluria	Lymph in the urine.
cryptorchidism, cryptorchism	A birth defect in which one or both testes have failed to properly descend into the scrotum.
cystitis	Inflammation or infection of the urinary bladder, typically caused by bacteria.
cystocele	Herniation of the urinary bladder.
dysuria	Painful urination.
edema	The presence of extracellular water and sodium in cells, tissues, or cavities.
enuresis	Bed-wetting. Enuresis is normal in the first 2 to 3 years of childhood. It is considered abnormal in older children and adults.

epididymitis	Inflammation of the epididymis.
erectile dysfunction	The inability to achieve and/or maintain an erection adequate for sexual intercourse.
glomerulonephritis	Inflammation of the glomeruli (filtration membranes) resulting in plasma proteins entering the urine.
glucosuria	Glucose (sugar) in the urine. This may indicate diabetes mellitus. Also called *glycosuria*.
hematospermia	Blood in the semen.
hematuria	Blood in the urine.
hydrocele	An abnormal collection of fluid in a cavity, most commonly a testis. This condition may be congenital.
hypertension	Hypertension (high blood pressure) may be secondary to renal disease.

inguinal hernia	A protrusion of a part of a structure through the abdomen or inguinal ring located in the inguinal region and caused by weakening in a body wall.
ketonuria	An abnormally high number of ketone bodies in the urine. Ketone bodies accumulate in the urine when the body is using fat, rather than sugar, for energy. This can be a sign of diabetes mellitus.
nephrolithiasis	Stones or crystalline structures in the urinary tract. Also called *urinary calculi* and *kidney stones*.
nephrotic syndrome	A group of signs and symptoms caused by the severe and chronic inability of the glomerulus to properly filter protein. Symptoms include edema and an abnormal excretion of protein in the urine. Also called *nephrosis*.

	output daily.
priapism	An abnormal, painful, and persistent erection.
prostate cancer, prostatic cancer	Malignancy of the prostate gland.
prostatitis	Inflammation of the prostate gland. It can be either acute or chronic. Acute is bacterial; chronic may or may not be bacterial.
proteinuria	Abnormal excretion of protein in the urine.
pyelonephritis	Bacterial infection of the renal pelvis and calyces. Can be either acute or chronic.
renal cell carcinoma	Cancer of the kidneys.
renal failure	The inability of the kidneys to function properly. Renal failure can be acute or chronic.
seminoma	A rare type of testicular malignancy typically occurring in young adult males.
testicular cancer	A malignancy of a testis.
uremia	The excessive accumulation in the blood of the byproducts of protein metabolism, especially urea. This is a toxic condition.

urethral carcinoma	Malignancy of a ureter.
urinary calculi	Stones or crystalline structures in the urinary tract. Also called *nephrolithiasis* or *kidney stones*.
urinary frequency	The need to void more often than normal. It is generally defined as needing to void more than 7 times a day.
urinary incontinence	The inability to control urination.
urinary tract infection (UTI)	A general term for any infection (usually microbial) of the urinary tract.
urinary tract obstruction	Any condition that blocks a part of the urinary tract, such as a ureter. Also called *obstructive uropathy*.

MEDICAL TERMS

- Nephrolithiasis - Kidney stones (renal calculi).
- interstitial nephritis - Inflammation of the connective tissue that lies between the renal tubules.
- Pyelonephritis - Inflammation of the lining of
- the renal pelvis and renal parenchyma. • renal cell carcinoma (hypernephroma) -
- Cancerous tumor of the kidney in adulthood.

DIAGNOSTIC PROCEDURES

- semen analysis - Microscopic examination of ejaculated fluid.
- castration - Surgical excision of testicles or ovaries.
- circumcision - Surgical procedure to remove the prepuce of the penis.
- digital rectal examination(DRE) - Finger palpation through the anal canal and rectum to examine the prostate gland.
- photoselective vaporization of the prostate
- (GreenLight PVP) - Removal of tissue to treat benign
- prostatic hyperplasia (BPH) using a green light laser (laser TURP)

- transurethral resection of the prostate
- (TURP) - Excision of benign prostatic hyperplasia using a resectoscope through the urethra.
- vasectomy - Bilateral surgical removal of a part of the vas deferens.

TRUS	transrectal ultrasonography
TUIP	transurethral incision of the prostate
TUR	transurethral resection
TURB	transurethral resection of the bladder
TURP	transurethral resection of the prostate
UA, U/A	urinalysis
UTI	urinary tract infection
VDRL	Veneral Disease Research Laboratory (test for syphilis)

THANK YOU