

### Urinary System Organs

Kidneys

Ureters

Urinary Bladder

Urethra

which filter blood and subsequently produce transport, store, and intermittently excrete urine (liquid waste).

### System divided by

The lower part constitutes the pelvic urinary organs and includes the short portion of the ureters, the urinary bladder, and the urethra. The suprarenal glands function as part of the endocrine system, secreting hormones like aldosterone.

### Urinary System Functions

1. **Filter** kidneys filter Waste processing

2. Waste processing. The kidneys process this filtrate, allowing wastes and excess ions to leave the body in urine while returning needed substances to the blood in just the right proportions

### Urinary System Functions (cont)

3. Elimination. Although the lungs and the skin also play roles in excretion, the kidneys bear the major responsibility for eliminating nitrogenous wastes, toxins, and drugs from the body.

4. Regulation. The kidneys also regulate the blood's volume and chemical makeup so that the proper balance between water and salts and between acids and bases is maintained.

5. Other regulatory functions. By producing the enzyme renin, they help regulate blood pressure, and their hormone erythropoietin stimulates red blood cell production in the bone marrow.

6. Conversion. Kidney cells also convert vitamin D to its active form.

### Key Facts

### Urine

waste by-products that result from metabolism are removed from the bloodstream through urine.

**Such harmful products include: urea and creatinine**

which are end products of protein metabolism

**drugs** or their breakdown products in diseased conditions, urine can contain glucose (as in diabetes mellitus), or proteins (in kidney disease), the excretion of which is normally prevented a considerable amount of water, the quantity of which is strictly controlled. when there is a heavy intake of water, and least when intake is low or when there is substantial water loss in some other way (for example by perspiration in hot weather). The ureters and urethra are simply passages for the transportation of urine into- and from the urinary bladder respectively.



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Not published yet.

Last updated 12th April, 2019.

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### 3 processes making urine

**glomerular filtration** BP forces water and small solutes out of glomeruli and into Bowman's capsules. This fluid is then called renal filtrate

**tubular reabsorption** Tubular reabsorption-Recovery of useful materials from renal filtrate and their return to blood in the peritubular capillaries.

**Tubular secretion** Tubular secretion-Substances actively secreted from blood in the peritubular capillaries into the filtrate in the renal tubules

About tubular reabsorption and secretion  
Exiting the glomerular capsule, renal filtrate enters the renal tubules.

### part of kidneys

**Renal cortex** forms outer region of kidney

**Renal medulla** forms inner region

**Renal columns** Extensions from renal cortex--divide interior region into cone-shaped sections

**Renal pyramids** cone-shaped sections. They consist of tubules for transporting urine away from cortex. Base of each pyramid faces outward toward cortex.

**Renal papilla** The point of the pyramid---faces hilum

**Minor calyx** renal papilla extends into this cup. Minor calyx collects urine leaving the papilla

**Major calyx** Two or three minor calyces join together and form a major calyx

**Renal pelvis** The major calyces converge to form this. It receives urine from major calyces

### Nephron

what is the functional part of the kidney  
the nephron

Urine is formed in 1 million nephrons per kidney.

Two major parts are:

\*Renal corpuscle w/ glomerulus

\*Renal tubule w/ peritubular capillaries.

Those are the two sites of exchange between blood plasma and urinary filtrate within the nephron.

All parts of renal tubule are surrounded by peritubular capillaries which arise from efferent arteriole and receive materials reabsorbed by the renal tubules



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