بسم الله الرحمن الرحيم

كلية آشور الجامعة – قسم تقنيات المختبرات الطبية/ 2nd stage Human Physiology

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Urinary Tract:

The urinary tract is the body's drainage system for removing urine, which is made up of wastes and extra fluid. For normal urination to occur, all body parts in the urinary tract need to work together, and in the correct order. The urinary tract includes two kidneys, two ureters, a bladder, and a urethra.

Parts and function of Urinary Tract:

- Two Kidneys.
- Two Ureters.
- Bladder.
- Two Sphincter Muscles.
- Urethra.

*__The Kidneys__: Is pair of purplish-brown organs, located on either side of the spine, just below the rib cage in the middle of the back. Kidneys, filter waste materials out of the blood and pass them out of the body as urine.

The basic functions of kidney include:

1- Regulation of extracellular fluid volume.

2- Regulation of osmolarity.

3- Regulation of ion concentrations.

4- **Regulation** of pH.

5- Excretion of wastes and toxins.

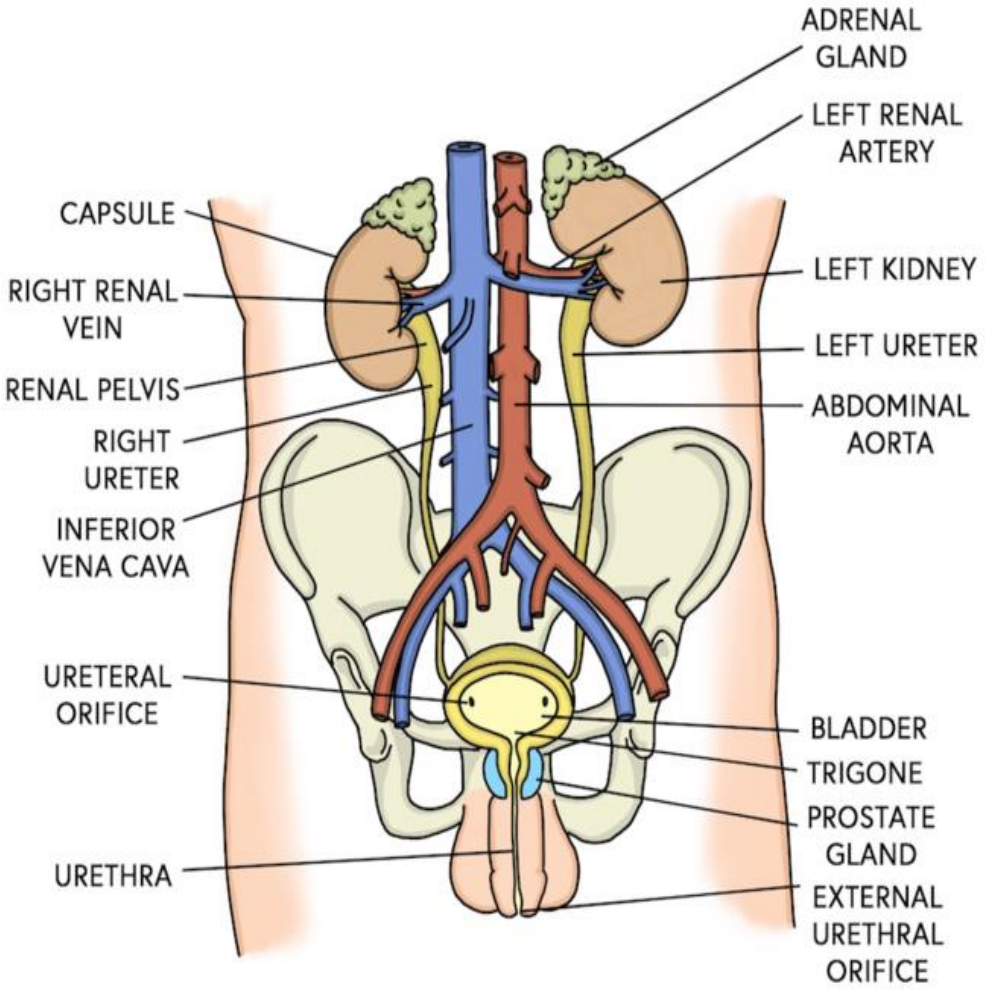
6- Production of **hormones**.

***The Ureters:**

There are two **ureters**, one attached to each kidney. In human, the ureters are tubes made of smooth muscle fibers that propel urine from the kidneys to the urinary bladder. In the adult, the ureters are usually 25–30 cm long and ~3–4 mm in diameter.

***The Bladder:**

The urinary bladder is the organ that collects urine excreted by the kidneys before disposal by urination. A hollow muscular, and distensible (or elastic) organ, the bladder sits on the pelvic floor. Urine enters the bladder via the ureters and exits via the urethra. There is no exact measurement for the volume of the human bladder, but different sources mention 500 mL to 1000 mL.



***Sphincter Muscles:**

A sphincter is a circular muscle that normally maintains constriction and which relaxes as required by normal physiological functioning. Sphincters are found in many animals. There are over 60 types in the human body, some microscopically.

***The Urethra:**

Is a tube that connects the urinary bladder to the urinary meatus for the removal of fluids from the body. In male, the urethra involve in carries semen as well as urine. In female, the urethra is shorter and emerges above the vaginal opening. The external urethral sphincter is a striated muscle that allows voluntary control over urination.

Urine Control:

The urine output is an important clinical parameter of renal function. urine is stored in the lowest part of the bladder (the neck) is encircled by a muscle (the urinary sphincter) that remains contracted to close off the channel that carries urine out of the body via urethra, so that urine is retained in the bladder until it is full.

When the bladder is full, messages travel nerves from the bladder to the spinal cord. The messages are then relayed to the brain, and the person becomes aware of the urge to urinate. A person who has control of urination can consciously and voluntarily decide whether to release the urine from the bladder or to hold it for a while. When the decision is made to urinate, the sphincter muscle relaxes, allowing urine to flow out through the urethra, and the bladder wall muscles contract to push the urine out. Muscles in the abdominal wall and floor of the pelvis can be contracted voluntarily to increase the pressure on the bladder.

Normal Urine Daily Volume: The normal range for 24-hour urine volume is 500 to **2,000** milliliters per day (with a normal fluid intake of about 2 liters per day). The urinary system is under influence of circulatory system, nervous system and endocrine system.

Aldosterone plays a central role regulating blood pressure through its effects on the kidney. It increases reabsorption of sodium from the glomerular filtrate, which results in retention of water and increases pressure and volume of blood.

Antidiuretic hormone (ADH) or Vasopressin is a hormone found in most mammals. It's made by the hypothalamus in the brain and stored in the posterior **pituitary gland**. It tells the kidneys how much water to conserve. ADH constantly regulates and balances the amount of water in the blood. It has two primary functions to retain water in the body, by increasing water reabsorption and constrict blood vessel.

The amount of urine produced by the body can be an indicator of the overall health of an individual. Urine is produced by the kidneys which filters the waste products and chemicals of the body and eliminates it through urine. If there is an increase or decrease in the urinary output of an individual, then it could be a sign that the kidneys are not functioning normally. The urinary output can also be affected by weather conditions. The urinary output also increases after consumption of alcoholic or caffeinated beverages. Certain medications which are metabolized in the liver can also increase urinary output.

Factor Influencing Urinary Elimination

There are six factor influenced the urinary elimination.

- Age
- Diet
- Fluid

- Physical exercise
- Psychological stress
- Temperature

*__Age__ is influences the control of elimination of urine. Children are not able to control urination as elders can do.

* __Diet__ is the main factor to eliminate of urine. The low-fiber foods cause a slow movement of the rest of the digestive be reached rectum, therefore increasing water absorption.

__*Fluid__ affects the urinary elimination. When a lot amount of fluid will not taken.

__* The physical exercise__ helps a person to maintain muscle tone. Good muscle tone of the abdominal muscles, pelvic muscles, and the diaphragm is very important for reduce the elimination of urine.

__*Psychological stress__, when the person more stressed or psychological disturbed, he having elimination of urine because body is in fear or not good.

__*Temperature,__ body temperature eliminates the urine.