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Question

Explain the urine formation and concentration?

Answer

The kidneys filter unwanted substances from the blood and produce urine to excrete them. There are three main steps of urine formation: glomerular filtration, reabsorption, and secretion. These processes ensure that only waste and excess water are removed from the body.

**Urine Formation**

* Glomerular filtration,
* Reabsorption.
* Secretion.

Urine Formation

Whether you call it the bathroom, the restroom, or the loo, there are two things that all people do there. This lesson is about the first one.

Urine is one of the body's waste products. It is primarily composed of water and urea. Urea is a special nitrogenous waste compound that the body must routinely remove. Urine formation occurs in the kidney in three stages: filtration, reabsorption, and secretion.

Filtration

Stage 1: filtration. The kidney is the body's blood filtering system. Blood vessels visit the kidney and enter a special ball of capillaries called the glomerulus. The glomerulus is nestled within a region of the kidney called the Bowman's Capsule. This is where filtration occurs. As blood is pushed through the tiny capillaries, the high-pressure forces some things to pass through the capillary walls. The walls act as a sieve or a filter. Hence, it is called filtration.

Water, sugar, salts, amino acids, nitrogenous wastes, and other tiny things enter the kidney as a substance called the filtrate. Cells and large blood proteins that cannot fit through remain in the blood vessels. The filtrate entering the kidney is like pre-pre-urine.

Reabsorption

Stage 2: reabsorption. The filtrate enters the kidney in the proximal tubule. This region of the kidney is special because many things can be removed from the filtrate. These valuable things are recollected, or reabsorbed, by the body.

Glucose, certain salts, vitamins, hormones,and amino acids are restored to the body and will not be included in urine. Sometimes, if the body has too much of something then the extra sugar or salt will stay in the filtrate. For example, diabetics with high levels of blood glucose may have glucose in their urine since it cannot all be reabsorbed. The filtrate after reabsorption is like pre-urine

Secretion

Stage 3: secretion. The filtrate then passes through a really neat structure called the Loop of Henle where it gains and loses water and salt. As it leaves the Loop of Henle, it enters the distal tubule, where secretion occurs.

The body sometimes needs to send things on the express route to excretion. For example, toxins are always sent on the fast track out of the body. They do not go through filtration and reabsorption. Instead, they are added, or secreted, directly from the blood vessel into the almost fully formed urine in the distal tubule.