

Functions of the Kidneys

The kidneys are essential for healthy living and survival. Most people are born with two kidneys, each about the size of an adult fist. The kidneys are bean-shaped and weigh around 150 grams each. The kidneys are located at both sides of your backbone just under the rib cage. The kidneys perform the following essential functions:

1. Regulation of water balance
2. Regulation of electrolyte and acid-base balance
3. Removal of waste products
4. Production of hormones

Regulation of water balance

The kidneys are responsible for the regulation of water balance in the body. Excess fluid in the body is removed as urine. Drinking more water and fluids will result in the production of more urine while inadequate fluid intake will result in the production of more concentrated urine.

Regulation of electrolyte and acid-base balance

The kidneys also play an important role in maintaining the right environment for normal body functioning in terms of salt and acid content. The critical regulation of the body's salt, potassium, other electrolytes/minerals and acid content is performed by the kidneys. The kidneys have the ability to remove the right amount of salt and other electrolytes/minerals from the blood to leave just the quantities that the body requires.

Removal of waste products

Waste products in the blood come from the normal breakdown of active tissues such as muscles, and from food. Waste products are removed by the kidneys in the urine. High levels of waste products in the blood are harmful to our bodies.

Production of hormones

The kidneys are responsible for the production of 3 important hormones:

1. Erythropoietin, which stimulates the bone marrow to produce red blood cells
2. Activated Vitamin D, which is essential for healthy bones
3. Renin, which plays a role in the regulation of blood pressure

肾脏的功能

肾脏是非常重要的器官。它主要的功能包括:

1. 身体水分的调节
2. 排泄废物、药物及有毒物质
3. 维持电解质的平衡
4. 维持酸碱平衡
5. 内分泌功能

身体水分的调节

- 肾脏会将循环至肾脏的血液加以过滤后，一部分形成尿液，一部分再吸收回体内
- 一天正常的尿液量约为一到二公升左右
- 肾脏会视身体状况来排除或保留水分
- 如天热、运动或劳动时出汗多，体内水分少了，尿量就减少；冷天尿就多些
- 饮水多了尿也多，不饮水尿就少些

排泄废物、药物及有毒物质

- 身体代谢后产生的废物如尿素，肌酸酐等会经血液循环至肾脏，再由肾脏将废物过滤并以尿液的形式将其排出体外，以达到排泄废物的功能

- 肾脏能把这些废物排出体外，让它不在血液中过量累积，从而维持人体正常生理的运作
- 不少药物也是由肾脏排泄的；一旦得了肾病，药物排出减少，用药量也必须相应减少，否则可能会发生药物中毒

维持电解质的平衡

- 电解质是身体所需要的物质
- 肾小球的滤液中含有血液中的各种电解质，当进入肾小管后，钠、钾、钙、磷、镁、碳酸氢等大部分被重吸收
- 肾小管能按人体的需要来调节其重吸收量；排除过多或保留身体所需的电解质，以维持身体正常功能

维持酸碱平衡

- 肾脏的功能也包括维持身体酸碱的平衡
- 肾脏能把新陈代谢过程中的酸性物质通过尿液排出体外，并能控制酸性和碱性物质排出的比例
- 当体内酸碱平衡失常时，人体的生理活动就会发生障碍，从而产生一些症状

肾脏的内分泌功能

- 肾脏不只是排泄器官，它也是重要的内分泌器官，当中就包括促进红细胞生成、活化维生素 D 及调节血压的功能

Article by Dr Ng Tsun Gun

URL: <http://www.kidneydoctor.sg>