

18/MHS07/044

PHS 212

Assignment: Write short note on the characteristics and components of urine.

Answer:

Physical characteristics that can be applied to urine include color, turbidity (transparency), smell (odor), pH (acidity – alkalinity) and density. Many of these characteristics are notable and identifiable by vision alone, but some require laboratory testing.

- **Color:** Typically yellow-amber, but varies according to recent diet and the concentration of the urine. Drinking more water generally tends to reduce the concentration of urine, and therefore causes it to have a lighter color. Dark urine may indicate dehydration. Red urine indicates red blood cells within the urine, a sign of kidney damage and disease.
- **Smell:** The smell of urine may provide health information. For example, urine of diabetics may have a sweet or fruity odor due to the presence of ketones (organic molecules of a particular structure) or glucose. Generally fresh urine has a mild smell but aged urine has a stronger odor similar to that of ammonia.
- **The pH of normal urine** is generally in the range 4.6 – 8, with a typical average being around 6.0. Much of the variation occurs due to diet. For example, high protein diets result in more acidic urine, but vegetarian diets generally result in more alkaline urine (both within the typical range of 4.6 – 8).
- **Density:** Density is also known as “specific gravity.” This is the ratio of the weight of a volume of a substance compared with the weight of the same volume of distilled water. The density of normal urine ranges from 0.001 to 0.035.
- **Turbidity:** The turbidity of the urine sample is gauged subjectively and reported as clear, slightly cloudy, cloudy, opaque or flocculent. Normally, fresh urine is either clear or very slightly cloudy. Excess turbidity results from the presence of suspended particles in the urine, the cause of which can usually be determined by the results of the microscopic urine sediment examination. Common causes of abnormal turbidity include: increased cells, urinary tract infections or obstructions.

Abnormalities in any of these of physical characteristics may indicate disease or metabolic imbalances. These problems may seem superficial or minor on their own, but can actually be the symptoms for more serious diseases, such as diabetes mellitus, or a damaged glomerulus.

Normal Chemical Composition of Urine

Urine is an aqueous solution of greater than 95% water, with a minimum of these remaining constituents, in order of decreasing concentration:

- Urea 9.3 g/L.
 - Chloride 1.87 g/L.
 - Sodium 1.17 g/L.
 - Potassium 0.750 g/L.
 - Creatinine 0.670 g/L .
 - Other dissolved ions, inorganic and organic compounds (proteins, hormones, metabolites).
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- **UREA:** Ammonia contains nitrogen, which mixes with other elements in your body, including carbon, hydrogen, and oxygen, to form urea. Urea is a waste product that is excreted by the kidneys when you urinate. The urine urea nitrogen test determines how much urea is in the urine to assess the amount of protein breakdown.
 - **CHLORIDE:** Chloride is an electrolyte. It is a negatively charged ion that works with other electrolytes, such as potassium, sodium, and bicarbonate, to help regulate the amount of fluid in the body and maintain the acid-base balance. This test measures the level of chloride in the blood and/or urine. Chloride is present in all body fluids but is found in the highest concentration in the blood and in the fluid outside of the body's cells.
 - **SODIUM:** A urine sodium test checks the amount of sodium in a sample of your pee to see whether it's at a normal level. Having too much or too little sodium can mean there's an issue with your kidneys or perhaps another health matter. You may be asked to take a urine sodium test after you've already taken a sodium blood test and gotten results that are not normal. Sodium is an important electrolyte (a mineral in your blood and other bodily fluids) that helps your body and cells function. It helps your body regulate how much fluid it retains. Sodium is in almost everything you eat -- from chips and bread to even some medicine. When you eat too much sodium, your kidneys have the job of clearing it from your body. But if your kidneys are damaged, the organs can't remove sodium efficiently. The urine sodium test helps to figure out whether your kidneys are working as they should to remove sodium.

- **POTASSIUM:** A potassium test measures how much potassium is in the urine.
Potassium is both an electrolyte and a mineral. It helps balance the amounts of water and electrolytes in the body. (Water is the amount of fluid inside and outside the body's cells.) It is also important in how nerves and muscles work. Potassium levels often change with sodium levels. When sodium levels go up, potassium levels go down. When sodium levels go down, potassium levels go up. These levels are also affected by a hormone called aldosterone. This hormone is made by the adrenal glands. Potassium levels can be affected by how the kidneys are working, the blood pH, and the amount of potassium you eat. The hormone levels in your body, severe vomiting, and taking certain medicines such as diuretics and potassium supplements can also affect the levels. Certain cancer treatments that destroy cancer cells can also raise potassium levels.
- **CREATININE:** Creatinine is a chemical waste product produced by muscle metabolism. When your kidneys are functioning normally, they filter creatinine and other waste products out of your blood. These waste products are removed from your body through urination. A creatinine urine test measures the amount of creatinine in your urine.