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Pharmacology

200 level

Phs 212 assignment

Characteristics & components of urine

Question

Write a short note on the characteristics ( and components) of urine

Characteristics of Urine

## **Physical Characteristics**

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 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.

* Chemical Characteristics

Average urine production in adult humans is around 1.4 L of urine per person per day with a normal range of 0.6 to 2.6 L per person per day, produced in around 6 to 8 urinations per day depending on state of hydration, activity level, environmental factors, weight, and the individual's health. Producing too much or too little urine needs medical attention. [Polyuria](https://en.m.wikipedia.org/wiki/Polyuria) is a condition of excessive production of urine (> 2.5 L/day), [oliguria](https://en.m.wikipedia.org/wiki/Oliguria) when < 400 mL are produced, and [anuria](https://en.m.wikipedia.org/wiki/Anuria) being < 100 mL per day. On an elemental level, human **urine** contains 6.87 g/L carbon, 8.12 g/L nitrogen, 8.25 g/L oxygen, and 1.51 g/L hydrogen. The exact proportions vary with individuals and with factors such as diet and health.

Components of urine

Over 99 percent of urinary solutes are composed of only 68 chemicals which have a concentration of 10 mg/L or more. 42 compounds are actually involved. They may be classified as follows:

* Electrolytes such as sodium, potassium, calcium, magnesium and chloride
* Nitrogenous chemicals such as urea and creatinine
* Vitamins
* Hormones
* Organic acids such as uric acid
* Other organic compounds