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**COLLEGE: MEDICINE AND HEALTH SCIENCES**

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**COURSE TITLE: PHYSIOLOGY**

**COURSE CODE: PHS 212**

**ASSIGNMENT TITLE: RENAL PHYSIOLOGY**

**QUESTION:**

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

**ANSWER:**

**URINE**

This is liquid excrement consisting of water, salts and urea which is made in the kidney and produced through the urethra.

**PHYSICAL CHARACTERISTICS OF URINE**

The physical characteristics of urine are;

* Color
* Smell (odor)
* Turbidity ( transparency)
* pH (acidity - alkalinity)
* Density

Many of these characteristics are identifiable by vision alone but some require laboratory testing.

* **COLOR:** The color of the urine is typically yellow-amber but varies according to recent diet and 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 which is a sign of kidney damage and disease.
* **SMELL (ODOR):** Generally, fresh urine has a mild smell while aged urine has a stronger odor similar to that of ammonia. 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 or glucose.
* **TURBIDITY (TRANSPARENCY):** Normally, fresh urine is either clear or very slightly cloudy. The turbidity of the urine is gauged subjectively and reported as clear, slightly cloudy, cloudy, opaque or flocculent. Excess turbidity results from the presence of suspended particles in the urine, the cause of which can be determined by the results of the microscopic urine sediment examination. Abnormal turbidity can be caused by increased cells, urinary tract infections or obstructions.
* **pH (ACIDITY – ALKALINITY):** 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.
* **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 a volume of distilled water. The density of normal urine ranges from 0.001 to 0.035.

Abnormalities in any of these 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 COMPOSITION OF URINE**

* 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).

Urine is an aqueous solution of greater than 95% water, with a minimum of the above constituents, in order of decreasing concentration.