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CHARACTERISTICS OF URINE

a. Composition. Normal urine is composed of about 95 percent water and 5 percent solutes.

Normal solutes found in urine include:

(1) Urea.

(2) Creatinine.

(3) Uric acid.

4) Ketone bodies.

(5) Potassium.

(6) Sodium.

(7) Chloride.

b. Specific Gravity. The specific gravity of urine depends upon the amount of solutes present. The greater the concentration of solutes, the higher the specific gravity. Normal range for specific gravity is from 1.008 to 1.030.

c. Appearance. Urine is a transparent (clear) fluid. Color varies from pale yellow to dark amber, depending upon its concentration. (Concentration is the ratio of solutes to water.)

(1) Dilute urine may be pale, straw colored, or even appear colorless.

(2) Concentrated urine appears highly colored (for example, bright yellow or deep amber).

(3) Turbid (cloudy) urine is usually considered abnormal. It may be the result of blood, pus, sperm, or bacteria present in the urine.

d. Odor. Normal, freshly voided urine has a faint aromatic odor. Old, stale urine develops a strong ammonia odor from chemical breakdown.

(1) A strongly offensive odor may indicate the presence of bacteria.

(2) Diet selection can alter normal odor. Asparagus is a good example

(3) Some medications may alter the normal odor of urine. Ampicillin is one example.

e. Amount. The average, normal adult will excrete approximately 1,500 to 2,000 ml of urine each day (every 24 hours). This will vary with fluid intake and fluid loss. Fluid losses other than urination include fluid lost through vomiting, diarrhea, and "insensible" losses. Insensible fluid loss is that which is not perceptible or appreciable. Such loss includes that fluid which is lost through respiration, evaporation from the skin, and fecal content.

COMPONENTS OF URINE

Urine is a liquid byproduct of the body secreted by the kidneys through a process called urination and excreted through the urethra. The normal chemical composition of urine is mainly water content, but it also includes nitrogenous molecules, such as urea, as well as creatinine and other metabolic waste components. Other substances may be excreted in urine due to injury or infection of the glomeruli of the kidneys, which can alter the ability of the nephron to reabsorb or filter the different components of blood plasma.

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).

Urine is sterile until it reaches the urethra, where epithelial cells lining the urethra are colonized by facultatively anaerobic gram-negative rods and cocci. Urea is essentially a processed form of ammonia that is non-toxic to mammals, unlike ammonia, which can be highly toxic. It is processed from ammonia and carbon dioxide in the liver.

Abnormal Types of Urine

There are several conditions that can cause abnormal components to be excreted in urine or present as abnormal characteristics of urine. They are mostly referred to by the suffix -uria. Some of the more common types of abnormal urine include:

Proteinuria—Protein content in urine, often due to leaky or damaged glomeruli.

Oliguria—An abnormally small amount of urine, often due to shock or kidney damage.

Polyuria—An abnormally large amount of urine, often caused by diabetes.

Dysuria—Painful or uncomfortable urination, often from urinary tract infections.

Hematuria—Red blood cells in urine, from infection or injury.

Glycosuria—Glucose in urine, due to excess plasma glucose in diabetes, beyond the amount able to be reabsorbed in the proximal convoluted tubule.