

_Urinalysis

Lab Report

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The urinary system consists of various functions, but the whole purpose is to maintain the body's homeostasis. The urinary system includes two kidneys, two ureters, one bladder, one urethra, and one urethra meatus. The two kidneys are protected by the ribs and adipose capsules, kidneys are located by each side of the vertebral column. In each kidney there are 1.25 million nephrons, nephrons are microscopic filtering units that all work together to assist in filtering and purifying the blood by removing the excess water, sugar, metabolic products, salt and other substances that the body needs to use in order to regulate or maintain the pH level and the "homeostasis" of the body.

The "filter units" consists of collecting ducts, glomerulus, proximal convoluted tubule, distal convoluted tubule and lastly the Bowman's capsule these units work together in maintaining the body's homeostasis, most systemic organs has a job filtering the blood so in the urinary system the nephrons filter at least 150 quarts of liquid into 1 ½ to 2 quarts of urine to be released from the kidneys. After it is filtered, in the inner kidney where the medulla is located the collecting tubules carries the urine filtered by nephrons through the kidney and down the two ureters (10-12 inches) to the bladder where then urine is stored temporarily. The bladder is a hollow organ with a rugae structure so the bladder is able to expand because of the rugae ridges and hold up to 1-2 liters of urine (Marieb,2014). After the urine settles in the bladder, when it

gets full and the urge to release happens the urine will travel from the bladder down to the urethra tube which would carry the urine from and out of the body exiting through the external opening called the urethra meatus.

Depending on the sex of a person the urethra has a different structure, for women the urethra is only one and a half inches long which is separate from the reproductive system. On the other hand the urethra in the males body is used only by 2 body systems such as reproductive and urinary system, the male urethra is expected to be at least 8 inches long with the urine traveling through the prostate gland(Marieb,2014). Urine and semen come out separately, urine exits urinary and semen exits reproductive but never at the same time. The pH of urine can be around 4.5 acidic to 8 basic, urine consists of 95 percent of water and the rest of the 5 percent consists of other components such as uric acid, mineral salts, sugar, creatinine,urea and various other pigments (Marieb,2014)Urine can be used for detecting diseases and health conditions an individual may have, finding a high level of the other components in the urine can indicate some health problems. Diets with a high of protein most likely increases the acidity of urine (Marieb,2014), For example a UTI can be a indication of a alkaline-base urine because of the bacteria and breaking up of the urea

The Objective: An urinalysis is a diagnostic tool that is used to observe what should or what should not be present in the urine and also can be a great indicator for detecting disease or health conditions of a patient. Depending on what you digest and what your health condition is it is determined by urine and using a Multisix strip, in the lab activity the objective is to test the 3 different samples of 3 different patients ranging from normal to abnormal and using a multistix strip or dipstick to test the various levels of organic components that the urine sample may have.

Materials and Methods: When doing this experiment what would be needed is disposable gloves, normal urine or artificial urine to test out samples, dipsticks or Multistix to use for testing the urine, urinometer that is used to find the specific gravity, test tubes, test rack, test holders for samples, 10-cc graduated cylinders, testing reagents for the sulfates, hot plate, 500-ml beaker, test reagent for phosphate, a glass stirring rod to mix the samples and lastly test reagents for chloride. In this urinalysis inorganic and organic components are being tested in the urine to see the results.

Organic Components: When testing the presence of the urea in urine using a dipstick you must place two drops of urine onto a clean microscopic slide and then after place one drop of concentrated nitric acid to urine. Slowly warm the mixture with the hotplate from the materials until it begins to dry at the edges. When it cools down, examine the edges. For testing the presence of hemoglobin, ketones, bilirubin, albumins, leukocytes and urobilinogen a mixture of dipsticks (hemastix, clinistix, ketostix, etc) was used in the experiment. To test the glucose in the urine use a multistix, obtain the clinitest tablets and also a color chart, using a medicine dropper place 5 drops of urine into the test tube then use another dropper and add 10 drops of water into the tube. Use a timer, add a clinitest table and wait for 15 seconds for the results. Then record your results.

Inorganic Components: When testing the presence of sulfates use a 10-cc graduated cylinder, apply 5 ml of urine into the test tube then after that add on only a few drops of dilute hydrochloric acid and then 2ml of 10% barium chloride solution. The color white precipitate indicates a presence of sulfate. When testing the presence with phosphates, 5ml of urine was added to a tested and then 3 or 4 drops of dilute nitric acid and 3ml of ammonium was also applied to the tube, after mix it well with a glass stirring rod then heat it lowly in a hot water

bath. If the color yellow appears then phosphates are present. Place 5ml of urine in a test tube and then add several drops of silver nitrate, if the color presents white that means that chlorides are present and for the nitrites a combination dipstick was used to test for nitrites in the urine.

Test/ observation	Normal Urine	Abnormal Urine 1	Abnormal Urine 2
Color	Clear yellow	Pale Yellow	Pale Amber
Transparency	clear	cloudy	Cloudy
Odor	Yes	Yes	Yes
pH	6.5	6.0	8-8.5
Specific Gravity	1.025	1.030	1.005

Inorganic Components

Sulfate	Normal Urine	Abnormal Urine 1	Abnormal Urine 2
Phosphate	N/A	N/A	N/A
Chlorides	N/A	N/A	N/A
Nitrites	Absent	Absent	Absent

Organic Components

Normal Urine	Abnormal Urine 1	Abnormal Urine 2
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Glucose	Negative (blue)	Positive (Brown)	Positive (Green-ish Brown)
Ketone	Negative (color)	Positive (5-15 small)	Positive (5 small)
Bilirubin	Negative (clear)	Negative (clear)	Negative

Hemoglobin	Negative (orangish yellow)	Hemolyzed trace (olive green)	Large+++	
Leukocytes	Negative	Negative	Negative	

Urobilinogen	Negative (pale yellow)	Negative (pale yellow)	Negative (pale yellow)
Protein	Negative (No color)	Positive Teal (2000 or +)	Teal (2000 or +) Positive

Conclusion: In this lab experiment the whole diagnostics is to see if the three urine samples detect any diseases/ health conditions or inorganic/ organic components that are found in urine. A high level of glucose that is found in the urine is indicated for people that are diabetic and in the urine samples 1 and 2 both of the individuals detected for an uncontrolled diabetic mellitus found in the urine, they also have a high level of glucose so two sugar organic components both are working to provide some insulin. Both of the transparencies in abnormal urine 1 and 2 come out cloudy but unlike sample 2 the specific gravity is more lower indicating that the 1st sample urine consists of less water than the other abnormal sample 2 which shows that someone is dehydrated more than the other. The normal urine showed a normal pH of urine unlike the other samples, abnormal sample 1 tested for 6.0 pH which is slightly more acidic than the rest whereas abnormal sample 2 is more basic than acidic indicating some kind of bacteria in the urea. Both abnormal urines are high in proteins and albumins which indicates both samples having kidney damage.

REFERENCE PAGE

Marib, E.N., Smith, L.A., Mitchell, S.J (2014). *Human Anatomy & Physiology Laboratory Manual, Cat Version* .(11th edition) pg 621-626