

NEW YORK CITY COLLEGE OF TECHNOLOGY

A&P II, BIO 2312L Summer Term 2

LAB REPORT

**Urinalysis Lab**

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## **Introduction:**

A urinalysis is a common test done by medical professionals. This test can be used for many things like kidney failure, urinary tract infections, kidney/ureteral stones, acid-base disorders, abnormalities of volume status etc. A urinalysis can be divided into three parts; the first are physical characteristics which include the color and transparency, odor, pH, and specific gravity. The color and transparency of fresh urine is usually clear and pale yellow in color. This color is due to urochrome which is a pigment metabolite that comes from the body's destruction of hemoglobin. It then travels to the kidneys as bilirubin or bile pigments. Abnormal coloration of urine can be due to various drugs, certain foods, bile, or blood. Urinary tract infection can be indicated if the urine appears cloudy. Some drugs, vegetables, and diseases, such as diabetes mellitus, affect the odor of urine. Someone who suffers from diabetes mellitus has elevated levels of ketones in their urine, which makes the odor fruity or acetone-like. The pH of urine is slightly alkaline, ranging from 4.5 to 8.0 with the average being 6.0. The pH of urine can be more acidic if a diet is high on proteins and whole wheat products and more plant-based can increase the alkaline. Bacterial infections of the urinary tract may also cause the urine to become more alkaline. Specific gravity is the measure of concentration of solutes in urine. It measures the ratio of urine density compared to water density and provides information on the kidney's ability to concentrate urine. The second part includes inorganic compounds such as sulfates, phosphates, chlorides, and nitrates and the last part includes organic compounds such as urea, glucose, clinitest protein, ketone bodies, RBC's/hemoglobin, bilirubin, icotest, leukocytes, and urobilinogen. The objective of this lab activity was to successfully test

urine samples, understand the relationship between urine content and body functions, and correctly use and interpret a urine diagnostic stick test (multistix).

**Methods**

In the mornings, urine is the most concentrated and abnormal results are more noticeable in a urinalysis, that is why urine exams are recommended at that time. The first thing in starting a urinalysis test is to collect urine in a clean container. It is then examined in three ways, a microscopic exam, visual observance, and a dipstick test. Unfamiliar cloudiness or odor can represent an infection in the urine. Urine color is also based on how much water you drink and what you eat. A dipstick is a thin, plastic stick with strips of chemicals on it; this is the main item used in the dipstick test, and it is relatively simple to use. The chemical strips change color when there are certain substances in the urine. The dipstick test checks for pH level, concentration (specific gravity—shows how concentrated the particles in urine are), protein, bilirubin, ketones, glucose, nitrites, leukocytes, blood and urobilinogen. During a microscopic exam, several drops of urine are observed under the microscope. A microscopic urinalysis exam looks for red blood cells, white blood cells (leukocytes), bacteria or yeasts, casts (tube-shaped proteins which can signal kidney disorders), and crystals (which can be a sign of kidney stones and form from chemicals in urine).

**Results**

Test	Samples( Patients)
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	A	B	C	D	E
Pus (leukocytes/bacteri	High	Negative	Negative	Negative	Negative

a) (LEU)					
Nitrite	High	Negative	Negative	Negative	Negative
Urobilinogen (URO)	Negative	High	Negative	Negative	Negative
Protein (PRO)	High	Negative	Negative	High	Negative
pH	Negative	Negative	Negative	High	Moderately Affected
Red Blood Cells (erythrocytes-BLO )	Moderately affected	Negative	Negative	Negative	Negative
Specific Gravity(SG)	Negative	Negative	Negative	Moderately affected	High
Ketones(KET)	Negative	Negative	High	Negative	Moderately Affected
Bile Pigments (BIL)	Negative	High	Negative	Negative	Negative
Glucose Sugar(GLU)	Negative	Negative	Negative	Negative	High

### **Discussion/Conclusion**

Patient A shows proteins in the urine and a positive test for leukocytes. These 2 tests indicate a possible infection in this patient. In UTI, a small amount of blood is also seen in the urine. A nitrate test is positive which could be indicative of UTI by coliforms like Escherichia coil or Klebsiella. Patient B shows an increase in bile salts and urobilinogen in the urine. Both these tests indicate that the liver is affected and the patient is suffering from jaundice. Patient C shows otherwise normal urine but only the presence of ketones. As sugar is absent, this patient may be non-diabetic or different diet. There is some metabolic effect that has released ketones in the

urine. Starvation could be one reason for this result. Or dehydration due to less intake of water or excessive diarrhea and vomiting can also cause an increase in ketones and their presence in the urine. Patient D shows proteinuria with pH and specific gravity of urine affectation. Both of these are indicators of kidney disease. Patient E shows clear signs of diabetic ketoacidosis. With high glucose and ketones, there is high diabetes, with pH moderately affected and an increase in specific gravity indicates that kidney function is also affected. Aside from the results of these patients; if you are being treated with antibiotics for a urinary tract infection, multistix can indicate if the infection is resolving and that indirectly points to the efficacy of antibiotics. When antibiotics are working, the signs of infection that is leukocytes and nitrate test reduce in intensity or become negative. This can indicate that the antibiotic is working. As you can see, a person's urine can show many infections by using multistix and help prevent further medical complications, which is why it is very important to take a urine exam annually at the doctors. Sometimes though, urine tests can be affected by many environmental and physiological reasons; pregnancy, starvation, stress, exercise, diet, water intake, alcohol, drugs and different antibiotics being taken.

#### REFERENCES

1. Fareed, Khaled. "Urinalysis (Urine) Test: Types, Drugs, Alcohol, Results and Interpretation." MedicineNet, MedicineNet, 11 Sept. 2019, [www.medicinenet.com/urinalysis/article.htm](http://www.medicinenet.com/urinalysis/article.htm).
2. Martini H., Frederic, Nath L., Judy. *Test Bank for Fundamentals of Anatomy and Physiology*. Eleventh edition. 2018.
3. Marieb, N., Elaine, Smith A., Lori. *Human Anatomy and Physiology, Laboratory Manual, Fetal Pig Version*. Twelfth edition. 2016, pp. 627-634.

