

Urinary Lab Report

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BIO 2312- Section D057

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Introduction:

The urinary system also referred to as the renal system plays an essential role in the human body. It carries out functions that filter and remove wastes and extra fluid. These waste products include urea, uric acid and creatine. The kidneys, ureter, bladder and urethra all make up the urinary system. These parts all work together for the proper function of urination and maintaining homeostasis. The system starts off in the kidneys that filter blood by removing urea and other wastes. The two bean-shaped kidneys in the rib-cage contain units called nephrons that each have small blood capillaries called glomerulus. It also consists of a renal tubule. The urea, water and other wastes products go through the nephrons and renal tubules. The kidneys are filtering about 120 to 150 quarts of blood which generates about 1 to 2 quarts of urine (U.S. Department of Health and Human Services). The two ureters then carry the urine from the kidney to the bladder. When the bladder is filled up it is emptied through the urethra (URMC).

There are many ways to test the health of the body. Some are more invasive than others. A common procedure that is relatively invasive is blood testing. Urinalysis, which tests the content of urine, provides a non invasive method of diagnosing health. It works by using test strips to analyze urine and its contents. This experiment used the Multistax test which is an urinalysis test. This procedure tests for the levels of glucose, bilirubin, ketones, specific gravity, pH, blood, protein, urobilinogen, nitrites and leukocytes. The objective of this lab is to use the dipstick method and analyze urine samples to detect any abnormalities in the human body. A person's food and water intake as well as the abnormalities in their body determines the contents in the urine.

Materials and Methods:

The materials include disposable gloves, normal and abnormal urine samples, wide range pH paper, test tubes, test tube racks, urinometer, 10 mL cylinder, and Multistix urine testing strips. This experiment initiated with students obtaining urine samples. After careful observation of the samples, Multistix testing strips were obtained. The test strips were dipped into each sample. After the test strip was carefully placed onto the table, it was observed for color changes. At different time increments, different results were shown. At 30 seconds, bilirubin and glucose are shown. At 40 seconds ketones are shown. At 45 seconds the specific gravity is shown. At 60 seconds the different levels of nitrite, urobilinogen, protein, pH, and blood are shown. Then at 2 minutes, leukocytes are shown. Finally, all results were recorded and the samples were compared.

Results:

Reading	Time (seconds)	Results	Color
Leukocytes	120	Negative	White
Nitrite	60	Negative	White
Urobilinogen	60	0.2 mg/dL	Yellow
Protein	60	Negative	Tan
pH	60	6.5	Tan
Blood	60	Negative	Yellow
Specific Gravity	45	1.025	Brown/Green
Ketone	40	Trace (5)	Light Pink
Bilirubin	30	Small (+)	Light Orange
Glucose	30	Negative	Aqua

Table 1. Multistix results for sample 1, Normal Urine (Artificial).

Reading	Time (seconds)	Results	Color
Leukocytes	120	Negative	White
Nitrite	60	Negative	White
Urobilinogen	60	0.2 mg/dL	Light Yellow
Protein	60	300 mg/dL	Light Green
pH	60	6.0	Orange
Blood	60	Hemolyzed Trace	Brown
Specific Gravity	45	1.050	Tan
Ketone	40	Small (15)	Dark Pink
Bilirubin	30	Small (+)	Light Orange
Glucose	30	2000 mg/dL or more	Brown

Table 2. Multistix results for sample 2, Abnormal Urine-1 (Artificial). Test strip represents a large amount of glucose in urine, with traces of blood.

Reading	Time (seconds)	Results	Color
Leukocytes	120	Negative	White
Nitrite	60	Negative	White
Urobilinogen	60	0.2 mg/dL	Yellow
Protein	60	2000 mg/dL	Green
pH	60	8.5	Green
Blood	60	Large (+++)	Dark Green
Specific Gravity	45	1.0005	Green
Ketone	40	Trace (5)	Light Pink
Bilirubin	30	Small (+)	Light Orange
Glucose	30	1000 md/dL	Army Green

Table 3. Multistix results for sample 3, Abnormal Urine-2 (Artificial). Test strip represents a large amount of blood and glucose in urine.

Discussion and Conclusion:

All three samples of urine came back negative for leukocytes and nitrites. Which is normal. All the urobilinogen levels were 0.2 mg/dL which fall within the normal urobilinogen range from 0.2 to 1.0 mg/dL. Sample 1 had no protein in the urine, as expected. Samples 2 and 3 had protein in the urine. Sample 2 had 300 mg/dL of protein while sample 3 had 2000 md/dL or protein. Ideally, there should be no protein in the blood. Normal urine pH ranges from 5 to 9 and all samples fell within the normal range. Urine should have no blood at all times. Sample 1 met those conditions. Sample 2 had traces of blood and sample 3 had a large amount of blood present in the urine. Urine should have specific gravity values of 1.001-1.035. All samples except sample 2 fall within this range. Sample 2, 1.050, shows signs of dehydration. Ketones were present in all

samples. This is not too alarming since small amounts don't raise much concern. For example, fasting induces increased levels of ketones. All samples had traces of bilirubin which is a concern since it should not be detectable. Sample 1 had no glucose in the urine. Sample 2 had 2000 mg/dL or more of glucose and sample 3 had 1000 mg/dL of glucose. Sample 2 and 3 had very abnormal levels of glucose. (PK Diet)

The normal sample, sample 1, shows traces of bilirubin. Ideally, normal urine shouldn't show bilirubin. There is always room for error in experiments. The test strips could have been previously contaminated or the sample containers were not properly cleaned. Experiments should always start with well sanitized equipment so there is little room for contamination.

Urinalysis is a means of understanding what's happening inside the body without getting very invasive. Urine shows what you're eating and how it affects your body. It also shows how your medical conditions affect your body and urine. With one teststrip, many questions can be answered. Each substance that the strip tests for, gives information on how the body is working. If too much glucose is found in the urine, then there is a need to investigate for diabetes. If the pH is too high or too low, the kidneys should be examined to see why there are such abnormalities. If the specific gravity is off, it sheds a light on the filtration of the renal system. This experiment provides valuable insight into the medical field and all of it's testing.

References

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