

## Clinical Urinalysis

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The Urinalysis Panel is performed as a general indicator of health. It provides a check of key indicators that directly influence well-being such as carbohydrate metabolism, kidney and liver function, acid-base balance, and bacteria. Although taken routinely to monitor the health status of a patient, urinalysis may also be used to diagnose an illness or monitor a chronic condition. Deviations from normal levels for a urinalysis test may indicate a disease process in the patient.

**Color/Appearance** – the color of normal (healthy) urine may be yellow to clear. Hydration level can make the urine appear darker or lighter. A reddish tinge or other colors could be due to liver or kidney problems, medications or food. Murky urine could result from an infection or kidney stones.

**Leukocytes** – the presence of leukocytes indicates that the patient is fighting an infection in the urinary tract or renal system. Normal range: normal urine specimens generally yield negative results.

**Nitrite** – the presence of nitrites indicates that there may be a urinary tract infection and the bacteria are converting nitrates to nitrites. Normal range: no nitrites should be present in urine produced from a healthy individual.

**Urobilinogen** – urobilinogen is a col-

orless substance formed in the intestines by bacterial action on bilirubin. Approximately half of urobilinogen is absorbed by the liver and excreted by the kidneys. High levels of urobilinogen may indicate liver disease. Normal range: 0.1- 1.0 mg/dL of urobilinogen.

**Protein** – excess protein in the urine (proteinuria) is a sign of kidney malfunction. The kidneys should act to recycle the protein in the bloodstream rather than excrete it. In the absence of renal abnormality, urinary protein excretion can be elevated by strenuous exercise, orthostatic proteinuria, dehydration, UTI, and acute illness with fever. Normal range: in normal urine, <15mg/dL of total protein is excreted per day.

**pH** – many diseases, diet and medicines can affect urinary pH (acidity/alkalinity). Urine that is either too acid or too alkaline can cause the formation of kidney stones. Normal range: 5.0 to 8.0

**Blood** in the urine can result from infections or stones in the kidney or bladder. Inflammation of the kidneys, the prostate or cancer can also cause blood in the urine. Normal range: normal urine should have no hemoglobin or yield negative results.

**Specific Gravity** is an indication of the concentration of dissolved substances in the urine. An increase in specific gravity can indicate dehydration (from sweating, diarrhea, eme-

sis), infection, or decrease blood flow to the kidneys. Decreased specific gravity can be caused by kidney failure and diabetes. Normal range: 1.005 to 1.030

**Ketones** – when ketones are present in the urine, the body is using fats as an energy source. It is commonly seen in diabetic patients and cases of starvation. In healthy individuals, ketones are formed in the liver and almost completely metabolized, so a negligible amount of ketones appear in the urine. Normal range: When no ketone is detectable in urine it will be reported as negative.

**Bilirubin** – bilirubin is produced by the breakdown of red blood cells. Normally, bilirubin is directed by the liver into the intestinal tract and is excreted with the feces. If the bile duct from the liver is blocked, the bile will be filtered by the kidneys instead. Hepatitis or other liver diseases can cause bilirubin to be diverted to the urine as well. Normal range: 0.1 – 1.0 mg/dL

**Glucose** – the most common reason for the urine to contain excessive amounts of glucose is diabetes. If the body cannot remove glucose quickly enough from the blood, long-term effects of excess glucose can damage the circulatory system, nervous system and kidneys. Normal range: 0 – 0.8 mmol/L