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## Types of Lab Work

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### CBC

CBC or complete blood count is a basic screening consisting of several tests that determine the number, variety, concentration, percentage, and quality of blood cells. The results provide information about the blood and other systems. The results can determine infection or anemia. The CBC offers information needed to develop diagnosis and prognosis, response to treatment, and recovery.

### BUN

BUN (Blood Urea Nitrogen), is a blood test, which measures the amount of nitrogen in urea. Urea is the final product of protein metabolism in the body. This test, measures kidney function and the production and excretion of urea. This is abnormal only in the late stage. It may be affected by other factors, such as GI bleeds and medications.

### CREATININE

Creatinine is the by-product of muscle energy metabolism, excreted by the kidney. This test is used with the BUN to determine kidney function. A kidney disorder that impairs function reduces the excretion of creatinine resulting in increased blood levels. This level becomes elevated once the kidney function is less than 40%.

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## Iron Tests

### Why is iron important?

Iron is needed to help form adequate numbers of red blood cells, which carry oxygen throughout the body. Iron is a critical part of hemoglobin (Hgb), the protein in red blood cells that binds oxygen in the lungs and releases it as blood travels to other parts of the body. Low iron levels can lead to anemia, in which the body does not have enough red blood cells. Evaluation of iron status can include several tests that are not always run together.



These include:

### **Serum iron level**

measures the level of iron in the liquid part of your blood

### **Ferritin level**

measures the amount of stored iron in your body. Ferritin is the main protein that stores iron for areas that need it, the liver and the bone marrow

### **Total Iron Binding Capacity (TIBC)**

measures the amount of transferrin, a blood protein that transports iron from the gut to the cells that use it. Your body makes transferrin in relationship to your need for iron, when iron stores are low, transferrin levels increase, while transferrin is low when there is too much iron. These tests are usually ordered together, and the changes in each can help your doctor interpret the cause of an abnormal result in one or more of these tests.

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## **Sodium, Potassium, Chloride**

### **Sodium**

Normal value = 135 - 145 meq/l

Sodium is the most abundant electrolyte found in the body. It accounts for 90% of the electrolyte fluid and is also the chief base of the blood.

### **Sodium has three primary functions in the body:**

1. Maintain osmotic pressure - balance between fluids of higher and lower concentrations.
2. Maintain acid - base balance - maintain a state of equilibrium or balance between the acids and alkalis.
3. Transmit nerve impulses.

**Hyponatremia** is a condition in, which there is a decreased sodium level. This may be found in severe burns, congestive heart failure, diarrhea and vomiting, Addison's disease, nephrotic syndrome, and the use of diuretics.



**Hypernatremia** is a condition in, which there is an increased sodium level. This may be found in dehydration, Cushings disease, and diabetes insipidus.

### **Potassium**

Normal value = 3.5 - 5.3 meq/l

Potassium is the primary electrolyte found within the cell, only small amounts are contained in the bones and blood. Like sodium, potassium plays an important role in nerve conduction and muscle function.

Potassium also helps to maintain acid - base balance, and osmotic pressure. Along with other electrolytes potassium controls the rate and force of contraction of the heart.

**Hypokalemia** a condition in which there is a decreased level of potassium. This can be found in diarrhea and vomiting, starvation, malabsorption, severe burns, and the use of diuretics and antibiotics.

**Hyperkalemia** is a condition when there is an increased potassium level. This can be found in renal failure, dehydration, severe burns, Addison's Disease, and uncontrolled Diabetes.

### **Chloride**

Normal values = 98 - 106 mmol/l

Chloride is a blood electrolyte that exists in the extracellular spaces. Like sodium and potassium chloride helps maintain osmotic pressure, acid - base balances and water balance.

Decreased chloride levels occur in severe vomiting, burns, diabetes, Addisons disease, and diuretic therapy. Increased chloride levels occur in dehydration, Cushings syndrome, hyperparathyroidism, and diabetes insipidus.

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## 24 Hour Urine Protein

Twenty-four-hour urine protein measures the amount of protein excreted in urine over a twenty-four-hour period.

How the test is performed is:

**Day one:** urinate into the toilet when you get up in the morning.

Afterwards, collect all urine in a special container for the next 24 hours.

**Day two:** urinate into the container when you get up in the morning.

Cap the container. Keep it in the refrigerator or a cool place during the collection period. Label the container with your name, the date, the time of completion, and return it as instructed.

Normally, less than 150mg of protein per day is excreted in the urine. Normal value ranges may vary slightly among different laboratories. Increased urinary protein is usually, but not always seen in people with chronic kidney disease.

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## Homocysteine

Homocysteine is a sulfur-containing amino acid that is normally present in very small amounts in all cells of the body. Homocysteine is an amino acid that must be derived from the diet since the body cannot produce it. In healthy cells, homocysteine is quickly converted to other products. Folic Acid is one of the B vitamins that is needed to metabolize homocysteine.

How is homocysteine tested?

Homocysteine test determines the level of homocysteine in the blood. A blood sample is taken from a vein in the arm to test for Homocysteine.



Some good sources of folic acid and vitamin B6 and B12 are cereal grains, fruit and vegetables, red meats, poultry, fish, and other seafoods. People with high homocysteine levels also benefit from taking multivitamins to supplement this amount. Please speak with your physician before taking multivitamins to see if they will benefit your condition.

There are numerous drugs that may either increase or decrease the amount of homocysteine in your body. You should always keep your physician aware of any medications, traditional or herbal, that you are taking, since they may interfere with the test results.

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## Urinalysis & 24-Hour Urine

### Why Is Urinalysis Done?

Urinalysis is a common, simple, noninvasive test of renal function. It is useful in the diagnosis of many conditions. It can measure or analyze sugar, protein, bacteria and cells.

### What Can the Test Determine?

The analysis has three purposes:

1. To detect abnormalities where the kidneys function normally, but excrete abnormal amounts of end waste products.
2. To detect conditions that may adversely affect the function of the kidneys or urinary tract.
3. Evaluate hormonal status as the cause of high blood pressure.

### 24-Hour Urine

This test requires collecting the urine specimen for 24 hours. This is done to accurately evaluate kidney function and protein loss.

### Why is the 24- Hour Urine Done?

Substances excreted through the urine differ in time, rate and amounts during the day and night. Therefore, a random specimen might not give an accurate picture when compared to the 24-hour collection. This test may be done for the measurement of Total urine protein, creatinine or electrolytes.

### Normal Values



- Urine volume  
750-2500 ml/24 hr.
- Urine protein  
10-140mg/l
- Urine creatinine  
0.6-1.8 g/24 hr.

#### Urine electrolytes

- Sodium > 40-220 meq/l
- Potassium 25-125 meq/24 hr.
- Chloride 140-250 meq/l

Glucose, ketones, and bacteria are abnormal findings.

#### **What Is Creatinine Clearance?**

This test is a specific measurement of kidney function, primarily glomerular filtration. It measures the rate at which the kidneys clear creatinine from the blood. This test requires you to collect your urine for 24hours. Results vary according to your age and sex.

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