

General Information about Laboratory Testing

Laboratory testing is a basic tool used to assess the health of your pet. It can be used when investigating a specific disease or disorder, in preparation for an anesthetic procedure, or as a general evaluation of a clinically normal animal. Laboratory testing also allows a veterinarian to monitor the progression of a pet's disease.

Results from laboratory testing are always evaluated in combination with many other factors. Test results that fall outside of the reported reference range may not be abnormal depending on the individual circumstance. If there are any questions regarding your pet's blood results or the interpretation of these results, please do not hesitate to ask one of our veterinarians.

Complete Blood Count (CBC) – this is the portion of the testing that examines the cell portion of the blood. It includes:

- **Red Blood Cell (RBC/erythrocytes)** is a count of the cells that carry oxygen through the body.
 - A high RBC count may indicate dehydration or bone marrow overproduction.
 - A low RBC count may indicate anemia, bleeding, chronic disease or malnutrition.
- **White Blood Cell (WBC/leukocytes)** is a count of the cells that fight infection.
 - An elevated WBC count can result from conditions such as bacterial infections, inflammations, leukemia, or stress.
 - A decreased WBC count can result from immune system disease or chemotherapy.
 - There are five different types of white blood cells: neutrophils, eosinophils, basophils, lymphocytes (LYMF) and monocytes.
 - Granulocytes (GRAN) is a subgroup of the WBC that include the neutrophils, eosinophils, and basophils.
 - Mid-sized cells (MID) is a subgroup of the WBC that consists primarily of monocytes.
 - Lymphocyte percentage (LPR), Granulocyte percentage (GPR), and Monocyte percentage (MPR) reflect the percentage of each subgroup in the total white blood cell count.
- **Hemoglobin (HGB)** measures the amount of oxygen-carrying protein in the blood.
 - A high hemoglobin level may be the result of dehydration, excess production of red blood cells in the bone marrow, or other conditions.
 - A low hemoglobin level may be the result of anemia, excessive bleeding, malnutrition, or chronic disease.
- **Hematocrit (HCT)** measures the amount of space red blood cells take up in the blood.
 - The most common cause of an increased hematocrit is dehydration.
 - Decreased hematocrit may be caused by anemia, malnutrition, recent bleeding, or chronic disease.
- **MCV, MCH, MCHC, and RDWR** are calculations derived from the RBC counts to help determine the size, shape and functionality of red blood cells.
- **Platelets (PLT)** (are clotting proteins and indicate how fast your pet's blood can clot) aid in blood clotting.
 - Increased platelet counts may be seen when there is no significant medical problem – but persistent increases may be a sign of a blood disorder.
 - Decreased platelet counts occur with bleeding abnormalities, bone marrow disease, immune disorders, and chemotherapy.
- **MPV** is a calculation derived from platelet counts to help determine the size of platelets.
- **CRBC** displays the size distribution of red blood cells.
- **CPLT** displays the size distribution of platelets.
- **CWBC** displays the size distribution of white blood cells.

Comprehensive Chemistry Panel – this is the portion of the testing that examines the fluid portion of the blood. It includes:

- **Aspartate Transferase (AST) and Alanine Transferase (ALT)** – enzymes produced in the liver.
 - Increased levels can be found with a damaged or diseased liver.
- **Total Bilirubin** – bilirubin is created from old red cells in the liver. It typically is eliminated from the body in urine and stool.
 - Increased levels can be seen with liver or gallbladder disease or in disorders where the red blood cells are being destroyed faster than normal.
 - Elevated bilirubin levels can make the skin have an abnormal yellow color (jaundice).
- **Alkaline Phosphatase (ALP)** – an enzyme that forms in body tissues.
 - Increased levels are typically found in animals with liver or bone disease – or in an animal taking prednisone.
- **Gamma-Glutamyl Transpeptidase (GGT)** – similar enzyme to ALP.

- Increased levels are typically found in animals with liver disease or taking prednisone.
- Does not increase in bone disease.
- **Total Protein(TP)** – composed of albumin and globulins.
 - Increased levels are seen in dehydration, chronic infections, and leukemia.
 - Decreased levels may be due to liver disease, malabsorption, renal disease, diarrhea, or poor nutrition.
- **Albumin (Alb)** – a protein that is made in the liver.
 - Increased levels are indicative of dehydration.
 - Decreased levels can be seen with liver disease, gastrointestinal disorders, and renal disease.
- **Globulins (Glob)** – proteins that are produced by the liver and white blood cells.
 - Levels in the blood are affected by infections, immune mediated disease, and cancers.
- **Cholesterol (Chol)** – a fat that does not contribute to heart disease as it does in people.
 - Increased levels are associated with diabetes, hypothyroidism, Cushing’s disease, and kidney disease.
- **Blood Urea Nitrogen (BUN)** – a measure of waste products in the bloodstream.
 - A high level can indicate kidney disease, intestinal bleeding, or dehydration.
 - A lower than normal level can be associated with liver disease.
- **Creatinine (Crea)** – a substance produced in the muscles that is excreted in the urine.
 - Elevated values indicate kidney disease or dehydration.
- **Phosphorus (Phos)** – elevated levels are seen in pets with chronic kidney disease.
- **Calcium (Ca)** -
 - High levels can be associated with cancer, kidney failure, bone disease, or rodent bait toxicity.
 - Low levels can occur before giving birth, with nursing, associated with diseases of the parathyroid gland, or associated with poisoning from antifreeze.
- **Glucose (Gluc)** – a measure of blood sugar.
 - Elevated levels are found with diabetes, liver disease, obesity, pancreatitis, and during periods of stress.
 - Decreased levels are seen with liver disease or overproduction of insulin.
- **Amylase and Lipase** – both are enzymes that may be increased with pancreatitis, liver disease, and kidney dysfunction.
- **Sodium (Na)** – an electrolyte which may be elevated due to dehydration. Decreased levels may be seen with Addison’s disease.
- **Potassium (K)** – an electrolyte which may be elevated with acute kidney failure, urinary obstruction, and Addison’s disease.
 - Decreased levels may be seen with vomiting, diarrhea, and chronic kidney failure in cats.
- **Chloride (Cl)** – an electrolyte which may be elevated with dehydration. Decreased levels are seen with chronic vomiting.
- **Creatinine Kinase (CK)** – an enzyme that is produced by damaged muscles. Significant elevated values indicate problems with muscle, possibly the heart.
- **Triglycerides (Tri)** – increased levels can be associated with a recent meal (most commonly) or a disease process (diabetes mellitus, hypothyroidism, acute pancreatitis).
- **Magnesium(Mg)** – elevated levels are found in kidney disease.
 - Decreased levels are associated with gastrointestinal problems, kidney disease, diabetes mellitus, and hyperthyroidism.
- **T4/FT4** – these tests examine thyroid enzyme levels for hypothyroidism (more common in dogs) and hyperthyroidism (more common in cats).
 - The FT4 test is a more specific test for these disorders.

Urinalysis – this is the portion of testing that analyzes various aspects of the urine. A urinalysis can aid in the diagnosis of a urinary tract infection, kidney disease, liver disease, and certain cancers.