

Explanation of Laboratory Results

Complete Blood Count (CBC)

White blood cells (WBC) - May indicate infection, elevated with systemic steroid use, decreased with autoimmune or some blood diseases among other causes. The following are types of WBCs with additional meaning:

- **Neutrophils** – Elevated with bacterial infection and low indicates an increased risk of infection.
- **Lymphocytes** – Elevated in viral infections and low with diseases such as hepatitis, lymphoma, or AIDS.
- **Eosinophils** – Elevated with allergies or infections with parasites.
- **Monocytes** – Elevated in blood diseases, certain infections or auto-immune diseases.
- **Basophils** – Elevated in blood diseases.

Red Blood Cells (RBC) – Elevated in dehydration, high altitude and CVD and low in anemia, hemorrhages, cancers, fluid overload in pregnancy.

Hemoglobin (Hgb) and Hematocrit (Hct) – Elevated in smokers and those with polycythemia and low anemia.

Mean Corpuscular Volume (MCV) – Elevated suggests Vit B12 or folic acid deficiency anemia and increased alcohol consumption and low iron deficiency.

Platelet Count (PLT) – Elevation is rare, low counts suggest medication interactions, antibody formation or liver disease and blood clotting problems.

Glucose (blood sugar) – Elevated with diabetes or systemic steroids but low may suggest pancreas or liver problems.

Heart Disease Risk

Homocysteine – Amino acid associated with increased cardiovascular disease risk, usually hereditary.

High-sensitivity C-Reaction Protein (hsCRP) – Inflammatory protein associated with cardiovascular disease risk.

Iron Status

Iron - Elevated with over consumption of iron rich foods/supplements, iron overload and low in iron deficiency.

Ferritin – Iron storage protein is elevated in iron overload, infections, cancers and low in pregnancy and bowel disease or surgery.

Transferrin Saturation (%) – Elevates in iron overload and low chronic iron deficiency anemia.

Total Iron Binding Capacity (TIBC) – Elevated in iron deficiency and low iron

chronic illness, cancer and infection.

Kidney Function

Blood Urea Nitrogen (BUN) – Elevated with kidney problems, recent surgery, dehydration or blood loss and low with liver disease, pregnancy and diets.

Creatinine (CR) – Elevated with kidney problems

Electrolytes –

- **Sodium (Na)** - Elevated with dehydration and low in patients who sweat profusely or are on diuretics (water pills)
- **Potassium (K)** - Elevated with kidney problems, potassium supplements, or certain diuretics and low in patients with kidney problems, vomiting or diarrhea.

Acid-Base Balance

- **Chloride (Cl)** – Elevated with dehydration, hyperventilation or kidney infection and low with vomiting and colitis.
- **Carbon Dioxide (CO)** – Elevated rare and low dehydration, diarrhea, exercise and kidney failure.

Bone Metabolism

- **Calcium** – Elevated with alcoholism, exercise, hyperparathyroidism and some cancers and low with diarrhea, malabsorption or calcium/Vit D deficiency, pancreatitis and renal failure.
 - **Phosphorus** – Elevated with low calcium, kidney problems and in hypoparathyroidism: low with alcoholism and vitamin D deficiency.
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Lipid Panel

Total Cholesterol – Elevation increases risk of heart disease and stroke.

HDL – “Good” cholesterol

LDL – “Bad” cholesterol

Triglycerides – Elevated in “mixed” hyperlipidemia often in Diabetics and Syndrome X patients.

Liver Functions Tests

- **Alanine aminotransferase (ALT or SGPT)** – An enzyme produced in liver cells is elevated when cells are excessively damaged or die secondary to hepatitis (viral, alcoholic, medication-induced, etc.)
- **Aspartate aminotransferase (AST or SGOT)** – An enzyme is produced in muscle and liver (less specific than ALT) can be elevated in a 1:1 ratio with liver disease.
- **Alkaline Phosphatase (Alk Phos)** – An enzyme produced in the bile ducts, intestine, kidney, placenta and bone. Elevation in normal or only modestly elevated ALT and AST activities, suggests disease of the bile ducts, alone with some bone disorders and growing children up to age 22.

- **Gamma-Glutamyltranspeptidase (GGT)** – An enzyme produced in the bile ducts may be elevated with bile duct disease, any liver disease, medications and alcohol consumption.
 - **Bilirubin** - The major breakdown product from old red blood cells are elevated with increased production, many different liver diseases and some non-liver disease.
 - **Actate Dehydrogenenase (LDH)** – Enzyme found in many organs may be elevated with hepatitis or with other organs diseases including the heart, lungs, skeletal muscles, the kidney or brain.
 - **Proteins** – Total proteins synthesized by the liver consist mainly of albumin and globulin are rarely elevated and low with poor liver function, malnutrition, some kidney disease and other rare condtions.
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Other – Cancer Screening

Pap smear – positive if microscopic evidence of infectious irritation (Candida, HPV, etc.) or preancerous cells in WOMEN.

PSA (Prostate specific Antigen) – Elevated with prostate infections, benign prostate enlargement (BPH) and prostate cancer in MEN.

Thyroid Function

- **Thyroid Stimulating Hormone (TSH)** – Sensitive measure of thyroid function and used to monitor thyroid replacement therapy.
 - **T3** - Elevated in some thyroid diseases and low in malnutrition, severe acute illness and trauma.
 - **T4** – Decrease with normal or elevated TSH suggests thyroid but with low TSH a pituitary disorder.
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Uric Acid – Elevated with gout.

Urinalysis (UA)- Tests for evidence of urinary tract infection and presence of blood, sugar, or protein in the urine.

White Blood cells – Indicates presence of possible infection.

Nitrites – Presence indicates infection.

Leukocyte estrace – Presence indicates infection.

Ketones – Elevated in diabetes, fasting, dieting or starvation.

Glucose- Elevated when blood sugar is over 180 and suggests diabetes.

Blood/Occult blood or RBC's – Presence suggest bleeding in the urinary tract infection, or may be related to menstruation. *The cause should always be determined especially in men.*

Protein – Presence may be seen with kidney problems, diabetes and bone cancer **among other causes.**

Urobilinogen – Presence may be seen in liver disease, breakage of blood cells and medication.