



## Normal Lab Values Page 1

### CBC - Complete Blood Cell Count With Differential



Lavender Tube

Blood Test	Abbrev.	Normal Range	Unit	Notes	
White Blood Cells	<b>WBC</b>	<b>5 - 10</b>	Cells/mcL	high= infection, very high= leukemia Low= poor immunity	
D I F F E R E N T I A L S	Neutrophils	<b>Neutro</b>	<b>40 - 60</b>	%	Elevated in bacterial and viral infections. Low = Neutropenia
	Neutrophil Bands	<b>Bands</b>	<b>3 - 7</b>	%	Emerging Neutrophils (look like bands) 8 or greater = "shift to left"
	Eosinophils	<b>Eosino</b>	<b>1 - 4</b>	%	Elevated With Allergic Reaction, Asthma, Parasitic Infection
	Basophils	<b>Baso</b>	<b>0.5 - 1</b>	%	High amount seen in bone marrow issues like Leukemia and Lymphoma
	Lymphocytes	<b>Lympho</b>	<b>20 - 40</b>	%	Lower amount seen with HIV Higher with viral infections, Leukemia
	Monocytes	<b>Mono</b>	<b>2 - 8</b>	%	Elevated with bacterial infection, TB, Malaria, Rocky Mountain Spotted Fever, Colitis, Enteritis
Red Blood Cells	<b>RBC</b>	<b>4.2 - 6.1</b>	x10 <sup>6</sup> /mcL	Low = Iron Deficiency Anemia or Blood Loss	
Hemoglobin	<b>Hgb</b>	<b>Male: 13 - 18 Female: 12 - 16</b>	g/dL	Hgb = Iron enriched, oxygen transporting proteins Low = Iron Deficiency Anemia or Blood Loss	
Hematocrit	<b>Hct</b>	<b>Male: 41 - 50 Female: 36 - 44</b>	Vol %	Hct= Volume Percentage of Red Blood Cells In Blood Low = Iron Deficiency Anemia or Blood Loss	
Platelets	<b>PLT</b>	<b>100 - 400</b>	mm <sup>3</sup>	Elevated with Thrombocytosis Lower with Thrombocytopenia	
Mean Corpuscular Volume	<b>MCV</b>	<b>80 - 100</b>	fL	Elevated in Pernicious Anemia, ETOH Lower in Iron Def. Anemia, Blood Loss	
Red Cell Distribution	<b>RDW</b>	<b>0 - 14.5</b>	%	Elevated in Iron, Folic, or Vit B-12 Deficient Anemia	

### CMP - Comprehensive Metabolic Panel (Includes BMP)



Green, Gold Or Tiger Tube

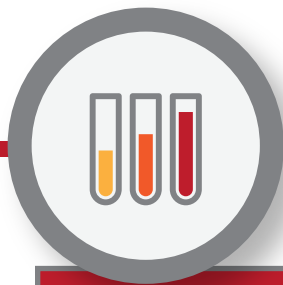
Protein, Total	<b>Prot</b>	<b>6.0 - 8.3</b>	g/d	Helps to diagnose nutritional problems, kidney disease or liver disease.
Alkaline Phosphatase	<b>Alk Phos</b>	<b>20 - 90</b>	U/L	Part of a routine liver function test to check for liver or bone disease.
Aspartate Aminotransferase	<b>AST</b>	<b>8 - 46</b>	U/L	Injury to the liver results in release of AST into the blood. Likely liver damage if ALT high too.
Alanine Aminotransferase	<b>ALT</b>	<b>10 - 30</b>	IU/mL	Injury to the liver results in release of ALT into the blood. High = Liver Damage
Bilirubin, Total	<b>T.billi</b>	<b>0.3 - 1.2</b>	mg/dL	High = Liver or Gallbladder problems. Check for Jaundice (Yellowing of skin, eyes)
Albumin	<b>Alb</b>	<b>4 - 6</b>	g/dL	Helps determine liver or kidney disease, or if the body is not absorbing enough protein.

#### (BMP - Basic Metabolic Panel) \* Also called Chem 7



Green, Gold or Tiger Tube

Sodium	<b>Na<sup>+</sup></b>	<b>135 - 145</b>	mEq/L	Low = Hyponatremia , High= Hypernatremia Critical low < 120; Critical High >160
Potassium	<b>K<sup>+</sup></b>	<b>3.5 - 5</b>	mEq/L	Low= Hypokalemia , High= Hyperkalemia Critical low < 2.6; Critical High >6.1
Carbon Dioxide - Bicarbonate	<b>CO<sub>2</sub> - HCO<sub>3</sub></b>	<b>20 - 29</b>	mEq/L	Out of range values can indicate possible acidosis/alkalosis imbalance. Check ABGs (Blood Gas) to confirm.
Chloride	<b>CL<sup>-</sup></b>	<b>95 - 105</b>	mEq/L	Same as above
Blood Urea Nitrogen	<b>BUN</b>	<b>7 - 20</b>	mg/dL	High = Impaired Renal (Kidney) Function
Creatinine	<b>Cr</b>	<b>0.8 - 1.2</b>	mg/dL	High = Impaired Renal (Kidney) Function
Glucose	<b>Glu</b>	<b>70 - 110</b>	mg/dL	Critical low < 40; Critical High >450 Normal Fasting Glucose 70 -100



# Normal Lab Values Page 2

## Blood Coagulation Studies ● Blue Tube

Blood Test	Abbrev.	Normal Range	Unit	Notes
Prothrombin Time	<b>PT</b>	<b>12 - 13</b>	Seconds	High= should only be higher if patient is on blood thinning med such as Coumadin/Warfarin.
Partial Thromboplastin Time	<b>PTT</b>	<b>30 - 40</b>	Seconds	High= Possible blood clotting disorder. PTT level is also used to monitor Heparin Therapy.
International Normalized Ratio	<b>INR</b>	<b>0.8 - 1.2</b>		Calculated with PT test. Normal INR is 0.8 - 1.2. Normal Coumadin/Warfarin INR is 2 - 3.
D-Dimer	<b>DDi</b>	<b>0 - 0.5</b>	ng/mL	High= Indicates that there may be blood clot somewhere in body. Seen with PE, DVT, Stroke.

## “ABG” / “VBG” - Arterial Blood Gas / Venous Blood Gas ● Use Heparin Syringe

Potential of Hydrogen	<b>pH</b>	<b>7.35 - 7.45</b>		High= Alkalosis Low= Acidosis
Partial Pressure of CO <sub>2</sub>	<b>CO<sub>2</sub></b>	<b>35 - 45</b>	mmHg	High= CO2 leads to acidosis, confusion, fatigue BiPap machine or vent used to balance CO2.
Bicarbonate	<b>HCO<sub>3</sub></b>	<b>22 - 26</b>	mEq/L	High= Not enough CO2 in the blood. Low= indicates organ failure, usually kidney
Saturation of Oxygen	<b>SaO<sub>2</sub></b>	<b>94 - 100</b>	%	This is also measured with a pulse oximeter. 88 - 90% level seen with COPD patients.
Lactic Acid	<b>Lactic</b>	<b>Arterial: 0.5 - 1.6 Venous: 0.5 - 2.2</b>	mEq/L	High= High lactic acid is seen with patients who are in acidosis usually caused by sepsis, hypoxia, DKA or have organ failure. Can also be drawn separately in grey tube and placed on ice for lab.
Partial Pressure of O2	<b>PaO<sub>2</sub></b>	<b>80 - 100</b>	mmHg	Low= hypoxia. It is measured in arterial blood. If widely different than SaO2, check equipment.

## Cholesterol / Lipid Panel ● Green Tube

Low Density Lipoprotein	<b>LDL</b>	<b>Below 130</b>	g/d	High= Not good. This is the “bad” cholesterol. Can lead to hardened or clogged blood vessels.
High Density Lipoprotein	<b>HDL</b>	<b>Above 50</b>	U/L	This is the “good” cholesterol. The HDL helps remove the bad cholesterol from blood vessels.
Triglycerides	<b>Tg</b>	<b>Below 150</b>	U/L	High= Bad. Triglycerides are a type of fat. Too much can lead heart disease, diabetes.
Cholesterol, Total	<b>Chol</b>	<b>Below 200</b>	IU/mL	Formula: Total HDL + LDL + 20% of Triglycerides. Optimal number is below 200.

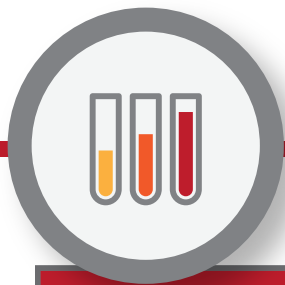
## Cardiac Enzymes / Markers ● Green Tube ● BNP

Troponin	<b>Trop</b>	<b>0 - 0.015</b>	mEq/L	Most common blood test to determine heart attack / MI. High= Cardiac muscle damage.
Creatinine Kinase	<b>CK-MB</b>	<b>0 - 3</b>	%	Older, less reliable test than Troponin. High = Cardiac muscle or skeletal muscle damage.
Brain Natriuretic Peptide	<b>BNP</b>	<b>0 - 100</b>	pg/mL	High = Heart Failure/CHF. Look for shortness of breath, “wet” cough, swelling in legs (edema).

## Kidney Function ● Green, Gold, or Tiger Tube

Blood Urea Nitrogen	<b>BUN</b>	<b>7 - 20</b>	mg/dL	High = Kidney Problem. Elevated Urea in the blood means the kidneys are not filtering it out.
Creatinine	<b>Creat</b>	<b>0.8 - 1.2</b>	mg/dL	Same as above. High Creatinine in blood means the kidneys are not filtering it out.
Glomerular Filtration Rate	<b>GFR</b>	<b>Greater than 90</b>	mg/g	Used to determine stage of kidney failure. Stage 2: 60-89; 3: 3-59; 4: 15-29; 5: <15

**\*Important.** Although these labs are color coded, lab values and tube colors can vary by institution. Always follow your facility’s policy regarding lab values and order of draw. © Nurse On Fire 2016



# Normal Lab Values page 3

## Other Common Labs By Tube Color

Test	Abbrev.	Normal Range	Unit	Notes
Iron	<b>Fe</b>	<b>60 - 170</b>	mcg/dL	High= hemolytic anemia, liver issue Low= can cause iron deficient anemia
Calcium	<b>Ca<sup>+</sup></b>	<b>8.5 - 10.5</b>	mg/dL	High= hyperparathyroidism, certain types of cancer Low= low Vit D, absorption issue, metabolic issue
Magnesium	<b>Mg</b>	<b>1.5 - 2.5</b>	mg/dL	High= Seen in Addison's Disease, Renal Failure, DKA Low= Diarrhea, Alcoholism, Pancreatitis, Cirrhosis
Amylase	<b>AMY</b>	<b>23 - 85</b>	U/L	High= Seen with Pancreatitis and Alcoholism
Lipase	<b>LIP</b>	<b>0 -160</b>	U/L	High= Seen with Pancreatitis, Bowel Obstruction, Gallstones, Ulcers, Celiac Disease
Ammonia	<b>NH<sub>3</sub></b>	<b>9.5 - 49</b>	mcg/dL	High= Seen with Liver Failure / Cirrhosis, Hepatitis GI Bleeding, Heart Failure, Leukemia. Put sample on ice .
Hemaglobin A1c	<b>A1c</b>	<b>4.0-5.6</b>	%	This test helps determine a person's average blood sugar levels over the last 3 months.
Glucose Tolerance Test	<b>GTT</b>	<b>Start - 70 -100</b> <b>Less than 200 (1hr)</b> <b>Less than 140 (2hr)</b> <b>Less than 120 (3hr)</b>	mg/dL	This test is done after at least 8 hrs of fasting and checks for Diabetes. The patient drinks a liquid high in sugar. Blood sugar is checked 4 times. The test is designed to see if your body can respond with enough insulin and metabolize the sugar given within the 3 hr period.

## UA - Urinalysis

Color	<b>Yellow</b>	Darker urine is a sign of dehydration. Unless menstrating, blood should not be seen in urine. Tea color = Possible Rhabdomyolysis.
Clarity	<b>Clear</b>	Cloudy urine can be a sign of an urinary tract infection. Urine should be clear, any other debris is not normal.
pH	<b>4.5 - 8.0</b>	Abnormal pH in urine usually goes along with whether the patient is in acidosis or alkalosis.
Specific Gravity	<b>1.01 - 1.05</b>	This test measures the ability of the kidney to concentrate or dilute urine as needed. It compares solutes to water.
Glucose	<b>Negative</b>	Helps to diagnose Diabetes. Unless the patient is known to have Diabetes, glucose should not be found in urine.
Ketones	<b>Negative</b>	Ketones are seen when patients are in acidosis, having muscle breakdown or are losing weight.
Nitrates	<b>Negative</b>	Positive nitrates in urine are seen with gram negative urinary tract infections. Neg nitrates does not rule out other types of infections.
Leukocytes	<b>Negative</b>	Also called Leukocyte Esterase. This is another way of saying that there is pus in the urine. Pus = Probable UTI
Bilirubin	<b>Negative</b>	This can be found in patients with Jaundice from Liver Failure, Hepatitis, Cirrhosis.
Protein	<b>0 - 20</b>	Protein in the urine usually indicates a problem with one or both kidneys. The kidneys should not excrete more than 150mg / 24hr.
Blood (Hemaglobin)	<b>0 - 3</b>	Blood in the urine is normally seen in patients with trauma, inflammation, infection, tumors, and kidney stones.
Red Blood Cells	<b>0 - 2</b>	Same as above
White Blood Cells	<b>0 - 5</b>	High amount usually = infection, except for patients with "IC" Interstitial Cystitis=Chronic Bladder inflammation w/out infection.
Casts	<b>0 - 5</b>	Casts are tiny tube-shaped particles. Elevated amounts can be seen with multiple types of kidney diseases.
Bacteria	<b>Negative</b>	High amounts of bacteria lead to UTIs or Urinary Tract Infections. Can be acquired from inadequate hygiene or sexual intercourse.
Yeast	<b>Negative</b>	Yeast is a fungal infection. It can be introduced into bladder when placing a catheter. Treated with oral or IV fungal medication.