

Lab Abnormalities



Lab	Increased Value	Decreased Value
Sodium	Dehydration; Diabetes Insipidus; hyperaldosteronism; renal failure	Diuretics; v/d; burns; pancreatitis; rhabdomyolysis; diabetic ketoacidosis; renal failure; CHF; SIADH
Potassium	Medications (ACE inhibitors, K sparing diuretics); acidosis; Addison's Disease; tumor lysis	Diuretics; Metabolic/Respiratory Alkalosis; Hyperaldosteronism; Diabetic Ketoacidosis
Chloride	Dehydration; trauma; acidosis; increased adrenal cortical hormones; head injury	V/D; NG suctioning; loss of K; respiratory acidosis; metabolic alkalosis; low NA diet; thiazides; loop diuretics; cystic fibrosis; Bartter's syndrome
CO2	Lung disease; dehydration; anorexia; Cushing's syndrome	Kidney disease; diabetic ketoacidosis; Addison's disease; Ethylene glycol poisoning; aspirin overdose
Anion Gap	Ketoacidosis; lactic acidosis; renal failure; drug overdose	Without acidosis: hypoalbuminemia; severe hyperlipidemia. w/acidosis: plasma cell dyscrasias; lithium intoxication
Glucose, Random	Diabetes; Cushing's syndrome; acromegaly; pheochromocytoma; glucocorticoids; thiazides; phenytoin; niacin; chronic pancreatitis; hemochromatosis; cystic fibrosis; cirrhosis	Medications; severe liver disease; alcohol intoxication; adrenocortical insufficiency; thyroid or growth hormone deficiency; malnutrition;
BUN	CHF; dehydration; ketoacidosis; diarrhea; fever; shock; thrombotic thrombocytopenic purpura; Addison's disease; hemorrhage; high protein diet; hyperalimentation; severe burns; MI; muscle wasting; sickle cell; renal failure; pyelonephritis; urinary tract obstruction; medications (Acetaminophen, allopurinol, aspirin, corticosteroids, dexamethasone, furosemide, ibuprofen, spironolactone, vancomycin...)	Low protein/High carbohydrate diet; malnutrition; nephrotic syndrome; pregnancy; overhydration; severe hepatic damage; SIADH; medications (anabolic steroids, fluorides; phenothiazines; streptomycin)
Total Protein	TB; Cushing's disease; rheumatoid arthritis; scleroderma; lupus; cholelithiasis; dehydration; diabetic ketoacidosis; liver disease; monocytic leukemia; alcoholism; exercise; medications (anabolic steroids, androgens, anticonvulsants, corticosteroids, digitalis, epinephrine, furosemide, insulin, thyroid agents....)	Agammaglobulinemia; severe burns; diabetes; essential hypertension; Crohn's disease; gastritis; ulcerative colitis; Whipple's disease; GI carcinoma; heart failure; cirrhosis; hepatic failure; hemorrhage; Hodgkin's disease; hypothyroidism; chronic renal failure; nephrosis; prolonged bed-rest; preeclampsia; medications (Acetylsalicylic acid, carvedilol, laxatives, rifampin, valproic acid)
Albumin	Dehydration, hypovolemia shock	Amyloidosis; cirrhosis; alcoholism; hepatitis; malnutrition; CHF; overhydration

Lab	Increased Value	Decreased Value
Calcium	Primary/secondary hyperparathyroidism; hyperthyroidism; TB; lymphomas; multiple myeloma; thiazide diuretics; increased calcium intake	Hypoparathyroidism; Vit D deficiency; renal loss; pancreatitis (severe)
Bilirubin, Total	Hepatitis; cirrhosis; liver metastasis; gallstones; biliary obstruction; hemolytic anemia; sickle cell disease; Crigler-Najjar syndrome (fatal)	n/a
Alkaline Phosphatase	Obstructive hepatobiliary disease; Paget's disease; bone metastases; osteomalacia; osteosarcoma; hyperparathyroidism; bowel infarction; hepatitis; TB; lymphoma; hemochromatosis	Temporary: post blood transfusion or heart bypass surgery. Zinc deficiency; hypophosphatasia; malnutrition; protein deficiency; Wilson disease
Alanine aminotransferase (ALT)	Hepatitis; obstruction of bile ducts; art or muscle injury; strenuous exercise; EBV; V; TB; Pneumonia; TPN; medications (Acetaminophen, rifampin, fluconazole, statins, NSAIDS...)	n/a
Creatinine	Renal function impairment; burns; CHF; dehydration; excessive exercise; hyper/hypothyroidism; infections; ketotic state; leukemia; acromegaly; ALS; muscular dystrophy; myasthenia gravis; poliomyelitis; rhabdomyolysis; shock; lupus; medicine (ACE inhibitors, acetaminophen, acyclovir, aspirin, benzodiazepines, beta blockers, NSAIDS, prednisone, salicylates, Vancomycin...)	Advanced/severe liver disease; decreased muscle mass; muscular dystrophy; myasthenia gravis; medicine (cannabis, dopamine, ibuprofen, lisinopril, nifedipine, prednisone, valproic acid...)
Auto WBC	Allergic reactions; burns; acute hemorrhage; hemolytic anemia; leukemia; sickle cell anemia; hypoxia/anoxia; infections (acute); acute rheumatoid arthritis; myositis; rheumatic fever; adrenal crisis; Cushing's disease; Diabetic ketoacidosis; thyroid storm; head trauma; intracranial hemorrhage; seizure; MI; splenectomy; medication (corticosteroids, digitalis, heparin, histamines, lithium)	Acute severe infection/inflammation; bone marrow depressants; AIDS; infections (septicemia gram negative, typhoid fever, chickenpox, Colorado tick fever, hepatitis, HIV, mononucleosis, influenza, measles, rubella, malaria) agranulocytosis; aplastic anemia; Vit B12 and folic acid deficiency; alcoholism; autoimmune neutropenia; lupus; cyclic neutropenia; hypersplenism; hypothermia; rheumatoid arthritis; Kostmann's syndrome; starvation; Hodgkin's disease; terminal carcinoma; renal failure
RBC (also review H&H)	Erythremic erythrocytosis; polycythemia vera; asthma, COPD, pneumonia, TB; high altitude; cardiopulmonary disorder; chronic carbon monoxide exposure; cerebellar hemangioblastoma; erythropoietin producing tumor; hepatoma; renal tumor/cyst; dehydration; v/d; medications (erythropoietin, glucocorticosteroids)	Burns; edematous states; pregnancy; carcinomas; chronic infections; leukemia; liver disease; lymphoma; Hodgkin's disease; multiple myeloma; myeloproliferative disorders; renal failure; sarcoidosis; lupus; anemia; Addison's disease; hypothyroidism; marrow aplasia; malaria; medications (acetaminophen, corticosteroids, diphenhydramine, penicillin...)

Lab	Increased Value	Decreased Value
Hematocrit	Pulmonary disease; congenital kidney tumors; smoking; high altitude; dehydration; polycythemia vera	Excessive loss of blood; nutritional deficiencies (iron, folate, B12); bone marrow injury (toxin, radiation, chemo, infection, drugs); aplastic anemia; leukemia; lymphoma; multiple myeloma; kidney failure; thalassemia; hemolytic anemia; sickle cell anemia
Hemoglobin	Polycythemia vera, dehydration, congenital heart disease, heart failure, smoking, kidney cancer, emphysema, high altitudes, kidney and/or liver cancer, smoking, COPD	Iron-deficiency anemia from poor diet or blood loss (like heavy periods or ulcers), vitamin deficiency anemia (B12 and folate), anemia of chronic illness (cancer, kidney disease), and inherited disorders (sickle cell anemia, thalassemia)
MCV/MCH	Vit B12 or folate deficiency; myelodysplasia; liver disease; hypothyroidism	Iron deficiency anemia; thalassemia
MCHC	Iron deficiency anemia; thalassemia	Autoimmune hemolytic anemia; burns; hereditary spherocytosis
RDW	Uniformity in size of RBCs	Iron deficiency anemia; pernicious anemia
Platelets	Cancer (lung, GI, breast, ovarian, lymphoma); rheumatoid arthritis; inflammatory bowel disease; lupus; iron deficiency anemia; hemolytic anemia; essential thrombocythemia; cirrhosis; pancreatitis; leukemia; rheumatic fever; trauma; TB; ulcerative colitis	Mononucleosis; measles; hepatitis; Rocky Mountain spotted fever; platelet autoantibody; cirrhosis; sepsis; leukemia; lymphoma; myelodysplasia; chemo/radiation therapy; medication (clopidogrel, abciximab, eptifibatid, acetaminophen, quinidine, sulfa drugs); alcohol toxicity; prolonged hypoxia
MPV	Idiopathic thrombocytopenic purpura; hyperthyroidism; pre- eclampsia	Septic thrombocytopenia; hypersplenism
Phosphorus	Hypoparathyroidism; renal failure; acromegaly; Vit D overdose; magnesium deficiency; tumor lysis; rhabdomyolysis; bowel infarction; malignant hyperthermia; hemolysis; cow's milk to premature infants; multiple myeloma; hypertriglyceridemia	Antacids; chronic diarrhea; Vit D deficiency; diuretics; hyperparathyroidism; kidney transplant; alcohol abuse; acidosis; increased insulin; sepsis; insulin; glucagon; epinephrine; cortisol
Magnesium	ESRD; hyperparathyroidism; hypothyroidism; dehydration; diabetic acidosis; Addison disease; overuse of magnesium-containing antacids/laxatives	Usually iatrogenic; GI/Renal/Drug induced loss (NG suction, diarrhea; malabsorption; short bowel) acute pancreatitis; malnutrition; parenteral fluid therapy; heart failure; cirrhosis; hypercalcemia; phosphate depletion; diuretics; aminoglycosides; antibiotics

Lab	Increased Value	Decreased Value
Lactate	Cardiac arrest; carbon monoxide poisoning; hemorrhage; hypoperfusion; MI; PE; seizures; sepsis with shock; severe anemia; severe hypoxemia; shock; status asthmaticus; trauma with shock; diabetes; leukemia; lymphoma; pheochromocytoma; renal failure; Reye's syndrome; severe hepatic disease; severe respiratory alkalosis; short-bowel syndrome; thiamine deficiency; medications (acetaminophen, albuterol, ethanol, glucagon, lactose, metformin, nitroprusside, Propofol, salicylates, valproic acid...); strenuous muscle exercise; hyperventilation; fasting	Weight loss; medications (carbicarb, morphine, omega-3 fatty acids, sodium bicarbonate, thiamine)
Lipase	Pancreatitis; pancreatic duct obstruction; pancreatic carcinoma; cholecystitis; chronic renal failure; Crohn's disease; cystic fibrosis; diabetes; gastric malignancy; hemodialysis; peritonitis; primary biliary cirrhosis; salivary adenitis; ulcerative colitis; medications (acetaminophen, cholinergics, codeine, enalapril, furosemide, hydrocortisone, ibuprofen, lisinopril, methylprednisolone, metronidazole, minocycline, morphine, naproxen, narcotics, prednisone, simvastatin...)	Diabetes (type I); cystic fibrosis with pancreatic insufficiency; medications (calcium, hydroxyurea, mesalamine, protamine, saline, somatostatin)
Lactate dehydrogenase	Hemolytic anemia; pernicious anemia; mononucleosis; meningitis; encephalitis; HIV; sepsis; MI; acute kidney failure; acute liver disease; pancreatitis; bone fractures; testicular cancer; lymphoma; severe shock; hypoxia; chemotherapy	Ingesting large amounts of ascorbic acid
Troponin-I	Acute MI; acute coronary syndrome; unstable angina; myocardial damage after CABG surgery or percutaneous transluminal coronary angioplasty; cardiac contusion/trauma; cardiac amyloidosis; defibrillation; nonischemic dilated or hypertrophic cardiomyopathy; myocarditis; ablation; sepsis; primary pulmonary hypertension; PE; scorpion envenomation; stroke (SAH); very heavy exercise	n/a
Procalcitonin	Severe bacterial infections: pneumonia, meningitis, SIRS; sepsis;	n/a

Lab	Increased Value	Decreased Value
NT proBNP	Heart failure; acute right ventricular strain r/t PE; CHF; A-fib; stroke; transient ischemic attack; ascites; myocarditis; Cushing's syndrome; primary hyperaldosteronism; hypertrophic/dilated cardiomyopathy; Kawasaki's disease; MI; pregnancy; pulmonary hypertension; renal failure; tachycarrhythmias; mitral/aortic stenosis; ventricular dysfunction/hypertrophy	n/a
ESR	Acute PID; bacteremia; cellulitis; endocarditis; hepatitis; mononucleosis; malaria; meningitis; pharyngitis; pneumonia; pyelonephritis; sepsis; sinusitis; syphilis; TB; typhoid fever; gout; Henoch-schonlein purpura; rheumatoid arthritis; scleroderma; lupus; systemic vasculitis; temporal arteritis; breast cancer; chronic lymphocytic leukemia; colorectal cancer; gastric carcinoma; Hodgkin's disease; lymphoma; multiple myeloma; prostate cancer; renal cell carcinoma; metastatic malignant tumors; acute pancreatitis; cholecystitis; IBD; hepatitis; peritonitis; MI; nephrosis; glomerulonephritis; endocarditis; anemia; hypothyroidism; Kawasaki's disease; macroglobulinemia; sarcoidosis; thyroiditis; trauma from surgery or burns; medications	Extreme leukocytosis; polycythemia; acanthocytosis; anisocytosis; microcytosis; Poikilocytosis; sickle cell disease; spherocytosis; hypofibrinogenemia; hypogammaglobulinemia; hyperviscosity syndrome; bile salts; hyperglycemia; medications (cortisone; dexamethasone, minocycline; prednisolone; prednisone, steroids...)
CK	Alcoholism; brain infarction (extensive); CHF; delirium tremens; dermatomyositis; head injury; hypothyroidism; hypoxic shock; GI tract infections; loss of blood supply to any muscle; malignant hyperthermia; MI; muscular dystrophies; myocarditis; neoplasms of the prostate, bladder, and GI tract; polymyositis; pregnancy; during labor; prolonged hypothermia; pulmonary edema; PE; Reye's syndrome; rhabdomyolysis; surgery; tachycardia; tetanus; trauma	Small stature; sedentary lifestyle
CRP NonCardiac	Acute bacterial infections; Crohn's disease; IBD; MI; pregnancy; Rheumatic fever; Rheumatoid arthritis; SLE; Syndrome X	n/a
PT/INR	Afibrinogenemia; dysfibrinogenemia; hypofibrinogenemia; alcohol use; biliary obstruction; DIC; cirrhosis; massive transfusion of RBCs; poor fat absorption; anticoagulant medication; salicylate intoxication; Vit K deficiency	Increased absorption of Vit K; ovarian hyperfunction; regional enteritis/ileitis

Lab	Increased Value	Decreased Value
PTT	Afibrinogenemia; antiphospholipid antibody syndrome; cholangiocarcinoma; DIC; factor deficiencies (Hemophilia A,B, Factor XII, XI, X, V, II, I); Gaucher's disease; hemodialysis; hypofibrinogenemia; leukemia; cirrhosis; lupus anticoagulant; malabsorption; polycythemia; renal disease; Vit K deficiency; von Willebrand's disease; therapeutic anticoagulants (heparin); medications (antihistamines, ascorbic acid, salicylates)	Hypercoagulable states; DIC
TSH	Ablative hypothyroidism; euthyroid sick syndrome; Hashimoto's thyroiditis; infantile hypothyroidism; primary hypothyroidism; TSH secreting tumor; thyroid hormone resistance; medications (Amiodarone, beta blockers, calcitonin, lithium, morphine, phenytoin, rifampin, tamoxifen, valproic acid)	Primary hyperthyroidism; Grave's disease; exogenous thyroid hormone (in excess); hypothalamic or pituitary failure

Urine Dip

Lab	Increased	Decreased
Color, Urine	<p>Deep yellow - Riboflavin Orange - Bilirubin, chrysophanic acid (e.g., rhubarb), phenazopyridine, santonin</p> <p>Pink - Beet pigment, hemoglobin, myoglobin, porphyrin, rhubarb</p> <p>Red - Beet pigment, hemoglobin, myoglobin, porphyrin, uroerythrin Green - Oxidized bilirubin, Clorets (breath mint)</p> <p>Blue - Diagnex, indican, methylene blue</p> <p>Brown - Bilirubin, hematin, methemoglobin, metronidazole, nitrofurantoin, metabolites of rhubarb, senna</p> <p>Black - Homogentisic acid, melanin Smoky – RBCs</p>	n/a
pH, Urine	Ingestion of citrus fruits; vegetarian diet; metabolic and respiratory alkalosis	Ingestion of cranberries; high protein diet; metabolic or respiratory acidosis
Protein, Urine	Benign proteinuria owing to stress, physical exercise, exposure to cold, or standing; diabetic nephropathy; glomerulonephritis; nephrosis; toxemia of pregnancy	n/a
Ketones, Urine	Diabetes; fasting; fever; high- protein diets; isopropanol intoxication; post anesthesia period; starvation; vomiting	n/a

Lab	Increased	Decreased
Blood, Urine	Alport's syndrome; Fabry's disease; glomerulonephritis; Goodpasture's disease; Henoch-Schönlein purpura; IgA nephropathy; Nail-patella syndrome; thin basement-membrane disease; hemolytic uremic syndrome; lupus; thrombotic thrombocytopenic purpura; vasculitis; arteriovenous malformation; hypercalciuria; hyperuricosuria; loin pain-hematuria syndrome; malignant hypertension; medullary sponge kidney; papillary necrosis; polycystic kidney disease; renal artery embolism; renal vein thrombosis; benign prostatic hyperplasia; cancer of kidney/ureteral/bladder/prostate or urethra; cystitis/pyelonephritis; nephrolithiasis; prostatitis; TB; trauma; DIC; endocarditis; heart failure; malaria; scurvy; gout; mononucleosis; leukemia; thrombocytopenia; AAA; hemophilia; dehydration; diverticulitis; burns; febrile illness; heavy smoking; strenuous exercise; transfusion; medications	n/a
Urobilinogen, Urine	Cirrhosis; heart failure; hemolytic anemia; hepatitis; mononucleosis; malaria; pernicious anemia	Antibiotic therapy; obstruction of the bile duct
Glucose, Urine	Diabetes	n/a
Bilirubin, Urine	Cirrhosis; hepatic tumor; hepatitis	n/a
Nitrite, Urine	Presence of nitrite-forming bacteria (e.g., Citrobacter, Enterobacter, Escherichia coli, Klebsiella, Proteus, Pseudomonas, Salmonella, and some species of Staphylococcus)	n/a

Lab	Increased	Decreased
Leukocytes, Urine	Cystitis; Epididymitis; Pelvic inflammatory disease (PID); prostatitis; pyelonephritis; urethritis; appendicitis; bladder tumors; diverticulitis; febrile illnesses; glomerulonephritis; interstitial nephritis; intra-abdominal abscess; lupus; noninfective inflammatory disease; pancreatitis; peritonitis; TB; kidney transplant rejection; strenuous exercise	n/a
Specific Gravity, Urine	Adrenal insufficiency; dehydration; diabetes; diarrhea; fever; diuresis; excess IV fluids; excess hydration	Hypothermia; impaired renal concentrating ability; heart failure; proteinuria; sweating; vomiting; water restriction; X-ray dyes