Albumin	The quantitative determination of albumin can aid in the diagnosis and management of numerous diseases including those involving the liver and kidneys. It may also be used to assess nutritional status although prealbumin is a better indicator of malnutrition.
A1-Antitrypsin	More than 70 genetic variants of alpha-1-antitrypsin (AAT) have been described. Not all of these are associated with decreased AAT levels or with clinical disease. An individual homozygous for PiZ has about 15% normal AAT and Pi null has no AAT. Such individuals are at significantly increased risk for development of pulmonary emphysema at an earlier age than individuals with a normal AAT phenotype; this process is accelerated by smoking. Development of liver disease may occur in infants (hepatitis and cirrhosis) and in older individuals (chronic hepatitis and cirrhosis). In individuals with a decreased level of AAT, Alpha 1 Antitrypsin Phenotyping is recommended.
ACE	The angiotensin converting enzyme assay is used to aid in the diagnosis of active sarcoidosis. It may be useful for confirmation of Gaucher's disease.
Alk Phos	The quantitative determination of alkaline phosphatase activity aids in the diagnosis and management of liver and bone diseases.
ALT	The quantitative determination of ALT (alanine aminotransferase) aids in the diagnosis and management of liver disease.
Amylase	Amylase measurements aid in the diagnosis and management of pancreatitis (inflammation of the pancreas).
ASO	Streptolysin O is one of several immunogenic exoenzymes produced by Group A, Beta-hemolytic streptococci. An elevated anti-streptolysin O (ASO) titer is usually indicative of a recent infection with a group A streptococci and is a routine part of the diagnosis and management of acute rheumatic fever and acute glomerulonephritis. In the absence of complications or reinfection, antibody levels usually fall to preinfection levels 6-12 months following infection.
AST	The quantitative determination of AST (aspartate aminotransferase) aids in the diagnosis and management of certain types of liver disease. AST is no longer recommended for diagnosis of myocardial infarction.
B2-Microglobulin	This assay is used to evaluate renal disease and to assess prognosis and monitor lymphoproliferative disorders, such as multiple myeloma and chronic lymphocytic leukemia.
BUN	The BUN assay is frequently requested in conjunction with the serum creatinine test for the differential diagnosis of prerenal (cardiac decompensation, water depletion, increases protein catabolism), renal (glomerulonephritis, chronic nephritis, polycystic kidney, nephrosclerosis, tubular necrosis), and postrenal (obstructions of the urinary tract) hyperuremia.
C3 Complement	C3 quantitation is used to detect individuals with congenital C3 deficiencies, or individuals who have depleted their complement levels due to an immunological process. C3 has the highest serum concentration of any complement component. Complement C3 is used as a screening test because it is consumed by activation of either the classical or alternative pathway. Individual assays for C3 and C4 are most useful in monitoring patients with immunologic diseases. Functional assays (e.g., the CH50 test) measure the activity of the entire complement cascade and are more likely to detect inherited deficiencies.
C4 Complement	C4 measurements should be performed whenever a complement activating disease is suspected or whenever hyposynthesis due to inherited deficiency is a possibility. C4 is the second most abundant complement protein in serum. C4 is only used in the classical pathway. Conditions affecting only the alternate pathway will not affect C4 levels. Individual assays for C3 and C4 are most useful in monitoring patients with immunologic diseases. Functional assays (e.g., the CH50 test) measure the activity of the entire complement cascade and are more likely to detect inherited deficiencies.
Calcium	The quantitative determination of calcium aids in the diagnosis and management of a variety of diseases including those involving the parathyroid glands, bone and kidneys.
Ceruloplasmin	Wilson's Disease is an autosomal recessive trait resulting in a copper metabolism disorder. It effects males and females equally. The onset of the disease is commonly seen in late childhood and early adult life. Affected individuals usually have ceruloplasmin levels less than 20 mg/dL. In these patients, free copper accumulates in selected areas of the body and may result in cirrhosis of the liver and central nervous system dysfunctions. These symptoms can improve with treatment. In untreated patients, the disease progresses and is usually fatal. Menke's Disease (also known as "kinky hair" disease) is a sex-linked disease that produces hypoceruloplasminemia. The disease affects only males and is characterized by steely hair, defective cross-linking of collagen and elastin, and neurologic findings. Menke's Disease is usually fatal within 3 years.
Cholesterol	Total cholesterol is used to assess the risk of ASCVD. It is recommended that HDL Cholesterol, non-LDL Cholesterol, LDL Cholesterol and Triglycerides also be obtained in initial screening. Several organizations have issued guidelines for management of dyslipidemias, all aiming to standardize and optimize patient care. The recent ACC/AHA guidelines aim to reduce/prevent heart disease, peripheral vascular disease and stroke by taking into account life style and lipid levels (1). Based on this information an estimate of ASCVD risk can be calculated and a decision on whether or not to treat (e.g. with statins) and modify life style can be made. The ACC/AHA guidelines do not recommend specific cholesterol set-points, but aim for a particular percent decrease in LDL cholesterol. Our lab will continue to use the ATP guideline cut-points in lipid reporting (2). The National Lipid Association also has recommendations that are similar to the ATP III guidelines (3). Total cholesterol may be decreased after acute myocardial infarction (AMI). Assessment of lipid status should therefore be determined within 24 hours of chest pain or 12 weeks following the AMI.
CK	The quantitative determination of CK (creatine kinase) and its isoenzymes aid in the diagnosis and management of myocardial, skeletal, and muscle diseases.
Cl	The quantitation of chloride aids in the diagnosis and treatment of electrolyte and metabolic disorders such as acidosis or alkalosis, dehydration, renal failure and hormone imbalance.
CO2	The CO_2 assay aids in the evaluation of acid-base balance.
Creatinine	The quantitative determination of creatinine aids in the diagnosis and treatment of renal diseases, in monitoring renal dialysis, and as a calculation basis for measuring other urine analytes. It is most sensitive in detecting renal impairment when used as part of a Creatinine Clearance test.

CRP	C-reactive protein (CRP) is an acute phase reactant and is used as a sensitive and quantitative measure of the body's acute phase response. CRP is not diagnostic for any specific disease. Increased CRP levels are consistently found in patients with acute bacterial and viral infections, rheumatoid arthritis, acute myocardial infarction, and widespread malignant disease. CRP levels respond to inflammation within 8 hours of onset and peak levels are reached within 24-48 hours. Levels may rise to 2000 times normal levels.CRP levels associated with viral infection, rheumatoid arthritis, and neoplasia are usually 10-40 mg/L. CRP levels of 40 to greater than 300 mg/L are usually associated with acute bacterial infections. Monitoring serum CRP levels aids in the detection and evaluation of post-operative complications associated with inflammation and/ or tissue necrosis. CRP levels evaluated 48-72 hours postoperatively may be 250-350 mg/L. These levels return to normal within one week.
CRP High Sensitivity	In an apparently healthy adult or in the absence of a known inflammatory process, hs-CRP assesses an individual's risk of developing a coronary event, stroke or peripheral vascular disease.
Dbili	The quantitative determination of direct bilirubin is used in the evaluation of liver and biliary disease.
GGT	The quantitative determination of GGT (gamma-glutamyl transferase) aids in the diagnosis and monitoring of hepatobiliary disease. GGT is currently the most sensitive enzymatic indicator of liver disease. Normal GGT values are rarely found in the presence of clinically significant hepatic disease.
Glucose	Glucose measurements are used in the diagnosis and management of disorders of carbohydrate metabolism; these include diabetes mellitus, neonatal hypoglycemia, idiopathic hypoglycemia, and pancreatic islet cell tumors.
Haptoglobin	Haptoglobin binds to hemoglobin released into the circulation by intravascular hemolysis. Haptoglobin is an acute phase reactant. Serial assays are used to detect and monitor hemolytic states. Haptoglobin is decreased in diseases associated with intravascular hemolysis. In severe hemolysis, haptoglobin may be totally depleted, requiring up to 1 week to return to normal. In chronic hemolytic states such as hemoglobinopathies and mechanical heart valves, there may be a steady decline in haptoglobin levels. In these conditions, serial assays provide a better index of ongoing hemolysis than a single haptoglobin value. Increased serum haptoglobin levels are present in infection, neoplasia, and other inflammatory conditions characterized by tissue injury and repair
HDL Chol	The quantitative determination of HDL (high-density lipoprotein) cholesterol aids in the diagnosis and treatment of lipid disorders. It should be used in the risk assessment of coronary artery disease (CAD). Low levels of HDL cholesterol are associated with an increased risk of CAD.
IgA	Selective IgA deficiency is a primary immunodeficiency disorder characterized by reduced production of IgA with recurrent respiratory and gastrointestinal infections. Selective IgA deficiency can result from congenital intrauterine infection with rubella virus,*Toxoplasma gondii* , or cytomegalovirus. A transient IgA deficiency may result following the treatment with penicillamine of Wilson's disease. Most patients with selective IgA deficiencies are asymptomatic. Symptomatic patients usually present with recurrent ear infections, sinusitis, pneumonia, diarrhea, asthma, autoimmune diseases and/or allergies. Administration of blood products containing IgA can cause some IgA deficient patients to develop antibodies against IgA. If an anti-IgA antibody develops, a massive allergic reaction can result during blood or plasma transfusions.
IgE	Hyperimmunoglobulinemia E syndrome is an autosomal dominant disorder of unknown cause. Patients present with recurrent staphylococcal abscesses involving the skin, lungs, joints, and soft tissues. Job's syndrome is closely related to this disorder. Patient's typically have normal serum immunoglobulin concentrations except for IgE, which is typically markedly elevated to levels in excess of 2000 IU/ml and as high as 20,000 to 50,000 IU/ml.
IgG	IgG levels can be used to evaluate humoral immunity and aids in the diagnosis of conditions associated with IgG excess or depression. IgG can cross the placenta. IgG antibodies are the most important and persistent antibodies of the secondary immune response.
IgM	IgM levels can be used to evaluate humoral immunity and to assist in the diagnosis of conditions associated with IgM excess or depression. IgM is the first antibody to appear in a primary antibody response. IgM does not cross the placenta. Increased IgM levels in the newborn are associated with intrauterine infections.
Iron	This assay is used in the evaluation of iron deficiency, hemochromatosis and to verify acute iron poisoning.
K	The quantitation of potassium is used to monitor electrolyte balance.Pseudohyperkalemia: If an increase in platelets or leukocytes is suspected as a cause of hyperkalemia, a heparin tube should be obtained for plasma potassium.
LD	Lactate dehydrogenase is present in multiple cells and tissue types and therefore its utility in patient diagnosis is questionable. It is useful in the assessment of in-vivo hemolysis and hematologic disorders (benign and malignant) conditions in which LD is often increased. LD is also increased following myocardial infarction, pulmonary and renal cortical infarction, liver disease, skeletal muscle disease, and many other conditions. Use of more specific enzymes and protein markers is preferable to LD in the diagnosis of myocardial infarction (use Troponin or CK-MB), skeletal muscle (use CK) and liver disease.
LDL Chol (Direct)	This direct quantitative determination of LDL cholesterol aids in the diagnosis and management of coronary atherosclerosis. Several organizations have issued guidelines for management of dyslipidemias, all aiming to standardize and optimize patient care. The recent ACC/AHA guidelines aim to reduce/prevent heart disease, peripheral vascular disease and stroke by taking into account life style and lipid levels. Based on this information an estimate of ASCVD risk can be calculated and a decision on whether or not to treat (e.g. with statins) and modify life style can be made. The ACC/AHA guidelines do not recommend specific cholesterol set-points, but aim for a particular percent decrease in LDL cholesterol. Our lab will continue to use the ATP guideline cut-points in lipid reporting. The National Lipid Association also has recommendations that are similar to the ATP III guidelines.
Lipase	This assay aids in the diagnosis of patients suspected of having acute pancreatitis.

Lipoprotein A1	Elevated levels of Lp(a) indicate a major risk for the development of atherosclerosis and coronary heart disease, independent of LDL-cholesterol levels. The wide differences in lipoprotein(a) levels seen among individuals are largely due to hereditary factors and cannot be controlled by dietary or lifestyle changes. Nevertheless, the identification of individuals at risk can be useful in alerting them to the need to eliminate or control other high risk factors.
Magnesium	The quantitation of magnesium aids in the investigation of unexplained hypocalcemia, in the management of patients following cardiac surgery or those with cardiac arrhythmias, and in the management of patients being treated for pre-eclampsia or eclampsia. An association between severe hypomagnesemia and aminoglycoside therapy has been described.
Na	The quantitation of **sodium** is used to monitor electrolyte balance.
Phosphorus	Measurement of inorganic phosphorus aids in the diagnosis and management of various disorders, including those involving the parathyroid gland, kidney, bone, and vitamin D metabolism.
PLACA	Lipoprotein-Associated Phospholipase A2 (Lp-PLA2) has been shown to be an independent inflammatory marker of cardiovascular risk and events. It is produced by macrophages in response to the presence of oxidized lipids and circulates primarily in association with low-density lipoprotein particles (LDL). Whereas hsCRP detects inflammation that is either part of atherosclerosis or some other systemic or localized process, Lp-PLA2 is much more specific for vascular inflammation and appears to be a marker of unstable atherosclerotic plaques. In the West of Scotland Coronary Prevention Study (WOSCOPS) (2), there was a two-fold risk of CHD in individuals in the highest quintile compared to the lowest quintile and in the Atherosclerosis Risks in Communities Study (ARIC) (3), there was almost a two-fold risk of ischemic stroke in individuals with an increased Lp-PLA2 level.
Plasma Hgb	This assay is useful for determining whether hemolysis is occurring *in vivo* . Plasma hemoglobin is increased with intravascular hemolysis, ABO incompatible transfusion, falciparum malaria, burns and march hemoglobinuria. Slight increases may occur with extravascular hemolysis, delayed transfusion reactions, and sickle cell anemia.
Pre-Albumin	Serum prealbumin levels are used as an index of subclinical or marginal protein-calorie malnutrition, as an indicator of response to total parenteral nutrition (TPN), a marker of nutritional status in premature infants, and as an index of liver function in hepatobiliary disease.
Rheumatoid Factor	Rheumatoid factor assay is one of the most frequently requested tests in the clinical investigation of patients with joint symptoms. Rheumatoid factor (RF) is usually an IgM autoantibody that reacts with the Fc portion of IgG. In the presence of pathogen-specific IgG antibodies, IgM RF can produce false-positive results in IgM assays. RF is not a screening test. The test performs poorly when applied to the general population.
Tbili	Total Bilirubin, Serum. The quantitative determination of bilirubin aids in the evaluation of liver disease, in the detection of hemolytic anemia, and in the evaluation of jaundice. Bilirubin, Cord Blood: Cord blood bilirubin may be a useful indicator of developing jaundice in newborns and a useful predictor of significant hyperbilirubinemia in the neonate.
Total Protein	Total protein measurements aid in the assessment of nutritional status (see Prealbumin) and may be useful in the diagnosis and management of a variety of diseases involving the liver, kidney, and bone marrow.
Transferrin	Transferrin functions as the principal plasma protein responsible for the transport of iron. Transferrin binds and transports iron and serves as a negative acute phase reactant (levels decrease during inflammatory processes). Transferrin levels in serum aid in the diagnosis of iron deficiency anemia, malnutrition, acute inflammation, infection, assessment of renal function, and red blood cell disorders. Serum transferrin concentration increases in iron deficiency anemia, pregnancy, and patients taking estrogens. Decreased transferrin levels are associated with chronic infections, malignancy, iron overload, hemolytic anemia, hemochromatosis, sickle cell disease, atransferrinemia, renal disease, and hepatic failure. Atransferrinemia is a rare congenital disorder. Patients with this disorder have very low levels of plasma transferrin. They also have iron overload and severe anemia that results from their inability to mobilize the body's iron stores.
Triglycerides	Triglyceride measurements aid in the diagnosis and management of patients with primary and secondary lipid disorders (e.g., diabetes mellitus, renal disease, liver obstruction, hypothyroidism).
Uric Acid	Uric acid measurements aid in the diagnosis and management of numerous renal and metabolic disorders, including renal failure, gout, leukemia, psoriasis, starvation or other wasting conditions, and of patients receiving cytotoxic drugs. It is recommended that patients being treated for gout maintain a uric acid level of less than 6 mg/dL.
Ammonia	The diagnostic utility of ammonia measurements is limited. The test is used mainly in the diagnosis of urea cycle defects and in the detection of Reye's syndrome. Levels of ammonia do not correlate well with CNS changes in end-stage liver disease.
B-OH Butyrate	This assay aids in the diagnosis and monitoring of therapy for diabetic ketoacidosis. This assay may also aid in the diagnosis of any patient presenting to the emergency room with documented hypoglycemia, acidosis, alcohol ingestion, or an unexplained increase in the anion gap and in the investigation of inborn errors of metabolism.
Ethanol	This assay is used to document prior consumption or administration of ethanol. Ethanol is the single most important abused substance in the U.S. Ethanol is found in beer, wine, and other liquors. Ethanol depresses cerebral functions similar to general anesthetics. Symptoms of ethanol abuse may include impaired thought, clouded judgment, and changed behavior. Blood ethanol levels correlate directly with the degree of intoxication.
Lactate	This assay aids in the evaluation of metabolic acidosis, regional or diffuse tissue hypoperfusion, hypoxia, shock, congestive heart failure, dehydration, complicated postoperative state, ketoacidosis or nonketotic acidosis in diabetes mellitus, patients with infections, inflammatory states, certain myopathies, acute leukemia and other neoplasia, enzyme defects, glycogen storage disease (type1), thiamine deficiency and hepatic failure.

Uric Acid Rasburicase	In patients being treated with Rasburicase (Elitek), "Uric Acid Rasburicase" should be ordered for 3 days following drug administration. This recommendation is based on the drug's half-life and the expected duration of activity. Rasburicase catalyzes the oxidation of uric acid into an inactive and soluble metabolite. It is used for prophylaxis and treatment of chemotherapy-induced or spontaneous acute tumor lysis syndrome. Rasburicase can cause spuriously low plasma uric acid levels if the specimen is transported or stored at room temperature (20-26°C or 68-78.8°F) or if processing is delayed. Uric Acid Rasburicase differs from Uric Acid in the collection and handling of the specimen. Transporting the specimen on ice and running it STAT helps to minimize (but not necessarily completely eliminate) the artifactual effects of rasburicase. Uric acid levels should be ordered in this way only when rasburicase has been administered to a patient.
Peritoneal Fluid	
Albumin	A serum ascites albumin gradient greater than or equal to 1.1 g/dL is consistent with portal hypertension from causes such as cirrhosis, congestive heart failure, or portal vein thrombosis. A low gradient (less than 1.1 g/dL) occurs in conditions such as peritoneal carcinomatosis, peritoneal tuberculosis, pancreatitis, serositis, and nephrotic syndrome. In the past a value of greater than or equal to 1.1 g/dL was interpreted as a transudate, and if less than 1.1 g/dL the fluid was interpreted as an exudate.
Amylase	Useful initially, in the classification of an effusion as an exudate or a transudate.
Tbili	Elevated body fluid bilirubin is suggestive of an exudative fluid. This testing should be performed in conjunction with other testing including serum bilirubin analysis, body fluid/serum protein ration, body fluids/serum lactate dehydrogenase ratio, and serum lactate dehydrogenase. Determination of body fluid bilirubin concentration can aid in the distinction between a transudative and an exudative fluid. Bilirubin values tend to be higher in exudates than in transudates, although there is some overlap between groups. However, a ratio of body fluids to serum bilirubin has been reported to identify exudative body fluids with sensitivity, specifically, positive predictive accuracy, and absolute accuracy equivalent to that obtained using Light's criteria for an exudative pleural fluid (pleural/serum protein ratio greater than 0.5, pleural/serum lactate dehydrogenase ratio greater than 0.6, and serum lactate dehydrogenase greater than 200 U/L).
Cholesterol	Peritoneal fluid cholesterol determination can distinguish cirrhotic versus malignant ascites.
Creatinine	Measurement of creatinine is useful to differentiate between peritoneal fluid and urine. Elevated peritoneal fluid creatinine, in association with normal serum creatinine, suggests urinary bladder leakage or rupture.
Glucose	Glucose measurement in body fluid may be useful with other laboratory tests to evaluate effusions. Decreased concentrations are associated with bacterial infections, inflammation such as rheumatoid arthritis, and occasionally malignancy.
LD	Measuring LD in fluid aspirated from a pleural effusion (or pericardial effusion) can help in the distinction between exudates (actively secreted fluid, e.g. due to inflammation) and transudates (passively secreted fluid, due to a high hydrostatic pressure or a low oncotic pressure). The most reliable method for differentiating between transudates and exudates is the simultaneous analysis of fluid and serum for lactic dehydrogenase (LD) and total protein level.
Total Protein	Total Protein Interpretation: Measurement of total protein in body fluids other than blood, urine, or cerebrospinal fluid is usually done to differentiate an inflammatory fluid collection (exudate) from one that is non-inflammatory (transudate). In pericardial, peritoneal, pleural, and synovial fluids, 3 g/dL is usually taken as the cut-off value for differentiating transudates from exudates. Some authors use a lower cut-off of 2.5 g/dL.Some references suggest using a ratio of fluid to serum protein to differentiate transudate from exudate. Protein is just one of several markers that can be used for differentiating transudates from exudates. Low total protein is seen in patients with cirrhosis of the liver when ascites develops late in the disease. Patients with a low value, below 1.5 g/dL, are at greater risk of developing spontaneous bacterial peritonitis. Knowing that the concentration is low has some prognostic value, although it should not be a reason for beginning prophylactic antibiotic therapy.
Triglycerides	Peritoneal fluid triglyceride determination can distinguish cirrhotic versus malignant ascites
Amniotic Fluid	
Glucose	The following criteria is/are considered to be predictive of a positive amniotic fluid culture: 1) Positive gram stain for bacteria or 2) WBC count >30 cells/mm3 and 3) Low amniotic fluid glucose less than 15 mg/dL. Laboratory studies on amniotic fluid should be performed on non-bloody fluid obtained by amniocentesis only.
Pleural Fluid	
Albumin	Serum albumin/pleural fluid albumin gradient of less than or equal to 1.2 g/dL is consistent with exudate.
Amylase	Useful initially, in the classification of an effusion as an exudate or a transudate.
Tbili	Pleural fluid bilirubin/serum bilirubin ratio of greater than or equal to 0.60 is consistent with exudate.
Cholesterol	Fluid cholesterol/serum cholesterol ratio greater than or equal to 0.3 or fluid cholesterol greater than 45 mg/dL is consistent with exudate.
Glucose	Pleural fluid glucose of less than 60 mg/dL or pleural fluid glucose/serum glucose ratio of less than 0.5 is abnormal. Abnormal pleural fluid glucose is seen in rheumatoid pleuritis and parapneumonic exudates. It can also be seen in malignancy, tuberculosis, SLE, and esophageal rupture.
LD	Pleural fluid LD/serum LD ratio of greater than or equal to 0.60 or pleural fluid LD greater than or equal to 2/3^{rds} the upper limit of normal serum LD level is consistent with exudate. Pleural fluid LD/serum LD ratio of less than 0.60 or pleural fluid LD less than or equal to 2/3^{rds} the upper limit of normal serum LD level is consistent with transudate.

Total Protein	Pleural fluid TP/serum TP ratio of greater than 0.5 or pleural fluid total protein level greater than 3.0 g/dL is consistent with exudate. Pleural fluid TP/serum TP ratio of less than or equal to 0.5 or pleural fluid total protein level less than or equal to 3.0 g/dL is consistent with transudate. Using total protein alone misclassifies exudates and transudates by approximately 30%. Sensitivity and specificity increases to 98% and 80%, respectively, when using both total protein and LD criteria for classifying exudates or transudates.
Triglycerides	Pleural fluid triglyceride levels greater than or equal to 110 mg/dL is indicative of chylous effusion. Pleural fluid triglyceride level less than 50 mg/dL is indicative of non-chylous effusion. Levels between 50-109 mg/dL are equivocal.
Dialysate Fluid	
Creatinine	Results of Creatinine, Glucose, and Urea Nitrogen are used by clinical staff in calculations to assess the adequacy of peritoneal dialysis.
Glucose	Results of Creatinine, Glucose, and Urea Nitrogen are used by clinical staff in calculations to assess the adequacy of peritoneal dialysis.
Urea Nitrogen	Results of Creatinine, Glucose, and Urea Nitrogen are used by clinical staff in calculations to assess the adequacy of peritoneal dialysis.
Pancreatic Fluid	
Amylase	Testing is used to determine whether a pancreatic cyst is likely to be benign or malignant. However these results cannot be used in isolation and should be used in conjunction with clinical information, imaging studies, and cytology.
Breast Milk	
Sodium	The composition of breast milk varies with the stage of lactation. It is usually not necessary to analyze breast milk electrolytes, however if a neonate is experiencing an electrolyte disorder, it may be appropriate to measure sodium or other electrolyte concentrations.
K	
Chloride	
Calcium	
Magnesium	
Stool	
K	Fecal osmolality is useful in cases of chronic diarrhea. It may be helpful to the physician to know whether the diarrhea is: 1. A secretory type caused by either an organism or an abnormality of water or electrolyte transport across the cell wall of the gut. 2. An osmotic type caused by malabsorption of non-electrolyte substances, most commonly carbohydrates or certain laxatives (e.g., magnesium). Fecal osmolality should be similar to serum osmolality. If the fecal osmolality is significantly lower than the serum or plasma osmolality (< 220 mOsmol/kg), factitious diarrhea (i.e., addition of water or liquid to stool by patient) should be suspected. If the fecal sample was not refrigerated immediately after collection, and if necessary frozen, the measured osmolality may be inappropriately elevated (> 330 mOsmol/kg). This change is due to bacterial metabolism which results in production of osmotically active substances. The Osmotic Gap is equal to the measured osmolality (mOsmol/kg) minus the calculated osmolality (in mOsmol/kg, equal to 2 times the fecal sodium plus fecal potassium). An Osmotic Gap > 125 mOsmol/kg with a fecal sodium < 60 mmol/L suggests an osmotic cause of the diarrhea. An Osmotic Gap < or = 50 mOsmol/kg with a fecal sodium > 90 mmol/L suggests a secretory cause of the diarrhea. The test results should be integrated into the clinical context for interpretation. Fecal chloride concentration is markedly elevated > 60 mmol/L in infants and > 100 mmol/L in adults associated with congenital and secondary chloridorrhea. Fecal chloride may be elevated (> 35 mmol/L) in phenolphthalein (or phenolphthalein plus magnesium hydroxide) induced diarrhea. Fecal chloride may be low (< 20 mmol/L) in sodium sulfate induced diarrhea.
Chloride	
Sodium	

Urine	
Amylase	The urinary amylase assay aids in the diagnosis of pancreatitis, pancreatic pseudocyst and macroamylasemia.
Calcium	24 hour urine calcium reflects intake, rates of intestinal calcium absorption, bone resorption and renal loss. Those processes relate to parathyroid hormone and vitamin D levels. Urinary calcium measurements are most useful for evaluation of patients with renal stones or a possible diagnosis of familial hypocalciuric hypercalcemia.
Chloride	Urinary chloride measurements aid in the differentiation of causes of metabolic alkalosis and help classify them as chloride responsive or unresponsive.
Creatinine	This assay aids in the diagnosis and management of renal diseases (when done as part of a Creatinine Clearance test), in monitoring renal dialysis, and as a calculation basis for measuring other urine analytes.
Glucose	This assay aids in the evaluation of glucosuria and renal tubular defects. It is rarely needed in the management of diabetes mellitus.
Magnesium	Magnesium measurements aid in the diagnosis and management of hypomagnesemia (abnormally low plasma levels of magnesium) and hypermagnesemia (abnormally high plasma levels of magnesium). Urine magnesium is measured as part of the Stone Former Panel and is useful in assessing the likelihood of stone formation.
Micro Albumin	Microalbuminuria is an amount of albumin in the urine above normal (10 mg/L) but below that detected by dipsticks for urinary protein (greater than 30 mg/dL). Microalbuminuria has an important predictive value in determining diabetic patients at risk of developing nephropathy. Microalbuminuria may also be caused by poor metabolic regulation, physical exercise, newly diagnosed diabetes, hypertension, and non-diabetic renal or systemic disease.
Phosphorus	Inorganic phosphorus measurements aid in the diagnosis and management of various disorders, including parathyroid gland and kidney diseases, vitamin D imbalance and kidney stones.

Potassium	Urinary potassium measurements are used to monitor electrolyte balance in the diagnosis and treatment of disease conditions characterized by low or high blood potassium levels.
Sodium	Urinary sodium measurements aid in the evaluation of patients with acute oliguria (low urine output), hyponatremia, and volume depletion.
Total Protein	Urinary protein measurements aid in the diagnosis and management of primary diseases involving the kidney and diseases which may secondarily involve the kidney, such as collagen-vascular disease, multiple myeloma, amyloidosis, metal poisoning, diabetes mellitus, pre-eclampsia, or eclampsia.
Urea (UUN)	Urine urea nitrogen is performed as part of the Stone Former Workup to evaluate a patient for the likelihood of renal calculi formation.
Uric Acid	Uric acid measurements aid in the diagnosis and treatment of numerous renal and metabolic disorders, including renal failure, gout, leukemia, psoriasis, starvation, or other wasting conditions, and of patients receiving cytotoxic drugs. It is also part of the Stone Former Workup and is useful in assessing the likelihood of stone formation.
CSF	
CSF Glucose	Evaluation of meningitis, neoplastic involvement of meninges, and other neurological disorders.
CSF Lactate	Evaluation of meningitis, neoplastic involvement of meninges, and other neurological disorders.
CSF LD	Evaluation of meningitis, neoplastic involvement of meninges, and other neurological disorders.
CSF Protein	Evaluation of meningitis, neoplastic involvement of meninges, and other neurological disorders.
Therapeutic Drugs	
Acetaminophen	Acetaminophen is an analgesic, antipyretic drug lacking in significant anti-inflammatory activity. This assay is used to monitor the therapeutic drug level and evaluate the toxicity of acetaminophen. Serum concentration and half-life are the only way to assess the degree of intoxication in the early stages since other liver function studies (bilirubin and liver function enzymes) will not show clinically significant increases until after tissue damage has occurred, at which point therapy is ineffective.
Amikacin	Amikacin is a semisynthetic aminoglycoside antibiotic with a broad spectrum of activity against gram-negative bacteria. This assay is used to monitor the therapeutic drug level and evaluate the toxicity of amikacin.
Carbamazepine	Carbamazepine is an anticonvulsant drug used in the treatment of generalized and partial seizures. This assay aids in monitoring carbamazepine levels to ensure appropriate therapy.
Digoxin	This assay is used to monitor the therapeutic drug level and evaluate the toxicity of digoxin. Digoxin is a cardiac glycoside that is commonly prescribed to treat congestive heart failure.
Gentamicin	Gentamicin is an aminoglycoside antibiotic which exhibits high potency and a broad spectrum bacterial action primarily against gram-negative organisms. Gentamicin is associated with renal and ototoxicity upon extended use. Therapeutic monitoring is advantageous particularly in patients with diminished renal function.
Lithium	This assay is used to monitor the therapeutic drug level and evaluate the toxicity of lithium.
Phenobarbital	Phenobarbital is an anti-convulsant and sedative-hypnotic drug. It is used for the treatment of epilepsy, particularly for controlling focal motor or sensory seizures and grand mal seizures. It is frequently co-administered with phenytoin for the control of complex seizure disorders and with valproic acid for complex partial seizures. Monitoring the serum concentrations of phenobarbital has been shown to improve patient therapy by aiding the physician in adjusting their dosage. Phenobarbital has a narrow therapeutic index and wide inter-individual variability in the rate of metabolism and clearance. This assay is used to monitor the therapeutic drug level and evaluate the toxicity of phenobarbital.
Phenytoin	Phenytoin is an anticonvulsant drug. It is occasionally used as an antiarrhythmic. In the treatment of epilepsy, phenytoin is indicated for grand mal epilepsy, cortical focal seizures and temporal lobe epilepsy. Phenytoin has a narrow therapeutic index and a wide interindividual variability in the rate of metabolism and clearance necessitating the determination of blood levels for patients receiving therapy. This assay is used to monitor the therapeutic drug level and evaluate the toxicity of phenytoin.
Salicylate	The salicylate assay aids in the diagnosis and treatment of salicylate overdose and in monitoring salicylate levels to insure appropriate therapy. Salicylates are a group of compounds used as analgesics, antipyretics and anti-inflammatory agents. Acetylsalicylic acid (aspirin) is the most commonly used salicylate. Salicylates are readily available over-the-counter and most salicylate therapy is the result of patient self-medication. For this reason, salicylates are often seen in overdose cases. Salicylate poisoning is seldom fatal, but causes side effects ranging from nausea, vomiting and tinnitus to fever, lethargy and coma. Prompt recognition and management are necessary to avoid serious consequences.
Theophylline	Theophylline is a naturally occurring compound with bronchodilator effects. It is used in the treatment of bronchospasm associated with bronchial asthma, chronic bronchitis and pulmonary emphysema. This assay is used to monitor the therapeutic drug level and evaluate the toxicity of theophylline. Due to the drug's narrow therapeutic range and the wide personal variation in the rate of metabolism and clearance, essentially every patient taking theophylline should have their serum levels monitored.
Tobramycin	Tobramycin is an aminoglycoside antibiotic. Tobramycin has a narrow therapeutic index which makes its use hazardous, especially in patients with impaired renal function. Accurate monitoring of the serum level in such patients is mandatory. This assay aids in the diagnosis and treatment of tobramycin overdose and in monitoring levels of tobramycin to ensure appropriate therapy.
Valproic Acid	Valproic acid is a broad-spectrum anticonvulsant drug used alone to treat simple and complex absence seizures and in combination with other anticonvulsant drugs for control of generalized seizures that include absence seizures. This assay is used to monitor the therapeutic drug level and evaluate the toxicity of valproic acid.

Vancomycin	Vancomycin is a glycopeptide antibiotic which is bactericidal against many gram-positive and some gram-negative cocci. It is used to treat severe staphylococcal infections in patients who cannot receive or who have failed to respond to the penicillins and cephalosporins. Vancomycin should be used with care due to its potential nephrotoxic and ototoxic effects. This assay aids in the diagnosis and treatment of vancomycin overdose and in monitoring levels of vancomycin to ensure appropriate therapy.
Methotrexate	This assay is used to monitor the therapeutic drug level and evaluate the toxicity of methotrexate. Methotrexate is an antineoplastic agent. It is used in the treatment of malignancies with rapid cell proliferation such as acute lymphoblastic leukemia, choriocarcinoma, trophoblastic tumors in women, and carcinomas of the breast, tongue, pharynx, and testis. It is also indicated in the treatment of severe psoriasis and adult rheumatoid arthritis.

DAU

Amphetamine/ Methamphetamine	Amphetamine and methamphetamine are central nervous system stimulants. They are usually administered orally or by intravenous injection. These drugs are prescribed for treatment of obesity, narcolepsy, hypotension, attention deficit disorder, and hyperactivity disorder. Because of their stimulant effects, the drugs are commonly sold illicitly and abused. This assay is used to aid in the diagnosis and treatment of amphetamine and/or methamphetamine use or abuse. This assay provides a preliminary analytical result. Positive results are confirmed by chromatographic methods.
Barbiturate	This assay is used to aid in the diagnosis and treatment of barbiturate use or abuse. This assay provides a preliminary analytical result. Positive results are confirmed by chromatographic methods. Barbiturates are central nervous system depressants. They are used therapeutically as sedatives, hypnotics, and anticonvulsants. The legal availability of barbiturates has declined but they remain frequently abused sedatives or hypnotic drugs. The most commonly abused barbiturates are the short-acting compounds such as secobarbital, pentobarbital and amobarbital. Tolerance to these drugs can develop from chronic use and death may occur from overdose.
Benzodiazepine	This assay is used to aid in the diagnosis and treatment of benzodiazepine use or abuse. This assay provides a preliminary analytical result. Positive results are confirmed by chromatographic methods. Benzodiazepines are central nervous system depressants composed of over 20 compounds. They are used clinically as sedatives, hypnotics, anxiolytics, muscle relaxants, antiepileptics, and in the treatment of alcohol withdrawal. Benzodiazepines are extensively metabolized with half-lives ranging from 1 to 100 hours. Urine levels vary due to each patient's metabolic and excretion rates.
Cannabinoid	This assay is used to aid in the diagnosis and treatment of cannabinoid use or abuse. This assay provides a preliminary analytical result. Positive results are confirmed by chromatographic methods. The primary psychoactive component of marijuana is delta-9-tetra-hydrocannabinol (THC). The THC concentration determines the potency of the marijuana. THC primarily affects the cardiovascular and central nervous systems. There is no reliable method for predicting the degree of impairment from cannabinoid concentrations measured in urine at this time.
Cocaine	Cocaine is a frequently abused drug. The drug is administered by nasal insufflation, intravenous injection or in the free base form as smoke inhalation. The urinary elimination of cocaine and its metabolite begins within 20 minutes of its intranasal administration. This assay is used to aid in the diagnosis and treatment of cocaine use or abuse. This assay provides a preliminary analytical result. Positive results are confirmed by chromatographic methods.
Methadone	Methadone is a synthetic narcotic analgesic that is similar to morphine. Methadone is commonly prescribed as the drug of choice in the maintenance treatment of heroin addicts. Patients on methadone therapy are routinely screened for methadone as a measure of compliance. This assay is used to aid in the diagnosis and treatment of methadone use or abuse. This assay provides a preliminary analytical result. Positive results are confirmed by chromatographic methods.
Opiate	Opiates act on several sites of the central nervous system. Their use results in analgesia, drowsiness, mood changes and some mental clouding. This assay is used to aid in the diagnosis and treatment of opiate use or abuse. This assay provides a preliminary analytical result. Positive results are confirmed by chromatographic methods.
Phencyclidine	Phencyclidine (PCP) is a drug of abuse. PCP acts as a stimulant, depressant, hallucinogenic and analgesic. It can be self-administered by smoking, nasal insufflation, intravenous injection or by oral ingestion. This assay is used to aid in the diagnosis and treatment of phencyclidine use or abuse. It provides a preliminary analytical result. Positive results are confirmed by chromatographic methods.
Fentanyl	Fentanyl is a synthetic narcotic analgesic of high potency and short duration of action. It may be administered by injection or is available as a transdermal patch for the management of chronic pain. This assay provides a preliminary analytical test result. Positive results are confirmed by chromatographic methods.
Oxycodone	Oxycodone is a semi-synthetic narcotic analgesic. Oxycodone can produce drug dependence and tolerance may develop with repeated administration. This assay provides a preliminary analytical test result. Positive results are confirmed by chromatographic methods.