Laboratory Test

Reference for the HCSRN VDW Laboratory Results Test Type

HCSRN VDW Lab Workgroup

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1 Laboratory Test Types

A Reference for the HCSRN VDW Laboratory Results Test Type. Version 2, April 2025

This reference document is not inclusive of all lab tests that have been deemed priority tests to incorporate into VDW format. The reference will be added to and updated on a regular basis as laboratory content is expanded in the VDW.

1.1 Chemistry Lab Tests

1.1.1 A_G_RATIO (Albumin to globulin ratio)

- Common Name: Albumin/globulin (A/G) ratio
- Long Name: Albumin to globulin ratio; A/G ratio in blood/serum
- Test Type: A_G_RATIO
- Panels: N/A
- Equivalent Tests: N/A
- Not Equivalent Tests: N/A
- Indications: To screen for some liver and kidney disorders as well as other diseases; to investigate the cause of abnormal pooling of fluid in tissue (edema).

- Description: Proteins form the structural part of most organs and make up enzymes and hormones that regulate body functions. There are two classes of proteins found in the blood, albumin and globulin. Albumin is a carrier of many small molecules, but its main purpose is to keep fluid from leaking out of blood vessels through osmotic pressure. Globulin proteins include enzymes, antibodies, and more than 500 other proteins. The ratio of albumin to globulin (A/G ratio) is calculated from values obtained by direct measurement of total protein and albumin. It represents the relative amounts of albumin and globulins. Normally, there is a little more albumin than globulins, resulting in a normal A/G ratio of slightly over 1. Because disease states affect the relative changes in albumin and globulins in different ways, this may assist in determining the cause of the change in protein levels. A low A/G ratio may reflect overproduction of globulins such as seen in multiple myeloma or autoimmune diseases, underproduction of albumin such as occurs with cirrhosis, or selective loss of albumin from the circulation as occurs with kidney disease (nephrotic syndrome). A high A/G ratio suggests underproduction of immunoglobulins as may be seen in some genetic deficiencies and in some leukemias. More specific tests, such as albumin, liver enzyme tests, and serum protein electrophoresis must be performed to make an accurate diagnosis.
- Related Tests: Albumin; Liver panel; Protein electrophoresis
- Approximate Reference Range: Ratio of 1.7 - 2.2 to 1
- Comments:
- Test Method Variance:
- Other:

– Associated LOINC:

1.1.2 AFP (Alpha-1 Fetoprotein)

NEEDS TO BE UPDATED

1.1.3 ALBUMIN (Albumin, total in blood/serum)

- Common Name: Albumin
- Long Name: Albumin, total in blood/serum

- Test Type: ALBUMIN
- Panels: Liver Panel
- Equivalent Tests: N/A
- Not Equivalent Tests: Prealbumin, microalbumin, urinalysis, liver panel
- Indications:

To screen for a liver disorder or kidney disease, or to evaluate nutritional status, along with or instead of a prealbumin test.

- Description:

This test measures the level of albumin in the blood. Albumin is the most abundant protein in the fluid portion of the blood (plasma). Albumin keeps fluid from leaking out of blood vessels, nourishes tissues, and transports hormones, vitamins, drugs, and ions like calcium throughout the body. Albumin is made in the liver. The concentration of albumin drops when the liver is damaged, when a person has a kidney disease that causes nephrotic syndrome, when a person is malnourished, has inflammation, or is in shock. Albumin levels can rise when a person is dehydrated. This is a relative increase that occurs as the volume of plasma decreases.

- Related Tests:

Prealbumin, microalbumin, urinalysis, liver panel

- Approximate Reference Range: 3.5 – 5.5 g/dL.
- Comments: An albumin test may be ordered as part of a liver panel to evaluate liver function, along with a creatinine and BUN (Blood Urea Nitrogen) to evaluate kidney function, or along with a prealbumin to evaluate nutritional status. Certain drugs increase albumin in the blood, including anabolic steroids, androgens, growth hormones, and insulin. Receiving large amounts of intravenous fluids may make the test results inaccurate for a short time after the intravenous fluids are administered.
- Test Method Variance:
- Other:
  - Associated LOINC:
  - Associated CPT:

1.1.4 ALP (Alkaline phosphatase)

- Common Name: ALP
- Long Name: Alkaline phosphatase, total isoenzymes in blood/serum
- Test Type: ALP
- Panels: Liver Panel
- Equivalent Tests: N/A
- Not Equivalent Tests: N/A
- Indications: Assists in detecting liver disease or bone disorders. In conditions affecting the liver, damaged liver cells release increased amounts of ALP into the blood.
- Description: ALP is an enzyme found in several body tissues, including liver, bone, kidney, bowel (intestine), and in the placenta of pregnant women. The highest concentrations of ALP are in bone and liver cells. Any condition causing excessive bone formation, including bone disorders such as Paget's disease and others such as rheumatoid arthritis and healing fractures, can cause increased ALP levels. Children and adolescents typically have higher blood ALP levels because their bones are still growing. ALP is often used to detect blocked bile ducts because ALP is especially high in the edges of the cells that join to form bile ducts. If one or more bile ducts are obstructed, for example by a tumor, blood levels of ALP can be high. Smaller increases of blood ALP levels are seen in liver cancer and cirrhosis, with use of drugs toxic to the liver, and in hepatitis.
- Related Tests: AST; ALT; GGT; Bilirubin
- Approximate Reference Range (Each site will have slight variations): Approximately 30-120 international units (IU)/L, although the normal ranges can vary slightly, e.g., some laboratories may have a normal range of 44 - 147 IU/L. Normal values vary with age and gender. High ALP levels are seen in children undergoing growth spurts and in pregnant women.
- Comments: Low levels of ALP may be present with zinc deficiency and are temporarily low after blood transfusions or heart bypass surgery. A rare genetic disorder of bone metabolism called hypophosphatasia

can cause very low levels of ALP. Temporary elevations are also seen with healing fractures. Oral contraceptives may decrease ALP; antiepileptics may increase ALP.

- Test Method Variance:
- Other:
  - Associated LOINC: 1783-0, 6768-6, 6769-4, 77141-0
  - Associated CPT: 82040

1.1.5 ALT (Alanine Aminotransferase, SGPT)

- Common Name: ALT/SGPT
- Long Name: Alanine Aminotransferase/SGPT
- Test Type: ALT
- Panels: Comprehensive metabolic profile
- Equivalent Tests: N/A
- Not Equivalent Tests: N/A
- Indications: Estimate liver function. ALT is an enzyme that is produced in liver cells (hepatocytes); it is relatively specific for liver disease. High levels of ALT in the bloodstream mean that there may be liver inflammation and/or damage. Many drugs and disease states can result in minor (1.5 to 2 times above normal) elevations of ALT that are asymptomatic.
- Description: Alanine aminotransferase has a relatively long half life (37-57 hours) and may remain elevated after liver inflamation has resolved. ALT rises greater than 10-30 times the upper normal limit often indicate infectious conditions (e.g., viral hepatitis) or serious drug-induced disease while more common, minor drug induced elevations of ALT are typically $<$ 3 times the upper normal limit
- Related Tests: SGPT is an older name for the same enzyme - Approximate Reference Range (Each site will have slight variations): approximately 10 - 65 IU/L
- Comments: - Test Method Variance: Method and reference ranges vary. Reported in international units per liter.

- Other:
  - Associated LOINC: 1742-6, 1743-4, 1744-2, 44785-4, 76625-3, 77144-4, 96586-3
  - Associated CPT: 84460

1.1.6 AMYLASE (Amylase, total in blood)

- Common Name:
- Long Name:
- Test Type:
- Panels:
- Equivalent Tests:
- Not Equivalent Tests:
- Indications:
- Description:
- Related Tests:
- Approximate Reference Range (Each site will have slight variations):
- Comments:
- Test Method Variance:
- Other:
  - Associated LOINC: 1798-8, 6697-7, 76630-3, 77146-9
  - Associated CPT: 82150

1.1.7 AST (Aspartate Aminotransferase, SGOT)

- Common Name: AST/SGOT
- Long Name: Aspartate Aminotransferase/SGOT
- Test Type: AST
- Panels: Comprehensive metabolic profile

- Equivalent Tests: N/A
- Not Equivalent Tests: N/A
- Indications: Estimate liver function. AST is found in other organs besides the liver, notably skeletal muscle, myocardium, brain, kidney and red blood cells. High AST levels in the bloodstream can be a sign of liver damage or heart attack. Many drugs and disease states can result in minor (1.5 to 2 times above normal) elevations of ALT that are asymptomatic.
- Description: AST rises higher than ALT in response to alcohol-related hepatic injury, usually at a ratio of 2:1 to 8:1, with the AST at 1 - 5 times the upper limit of normal. If the AST:ALT ratio $>$ 8:1, consider other forms of hepatic damage. In general, alcohol and drug-related AST elevations are usually less than 5 times the norm, or under 150u/l.
- Related Tests: SGOT is the older name for the same enzyme
- Approximate Reference Range (Each site will have slight variations): Approximately 15-35 IU/L
- Comments: Hemolysis will cause falsely elevated values.
- Test Method Variance: Method and reference ranges vary. Reported in international units per liter
- Other:
  - Associated LOINC: 1920-8, 27344-1, 30239-8, 44786-2, 88112-8, 96587-1
  - Associated CPT: 84450

1.1.8 (BILI) Bilirubin Test Types

1. BILI_DIR (Bilirubin, Direct)
   - Common Name: Direct Bilirubin
   - Long Name: Bilirubin, direct/conjugated/glucuronidated in blood/serum
   - Test Type: BILI_DIR
   - Panels: Hepatic/Liver Function Panel
   - Equivalent Tests: Direct bilirubin; Conjugated bilirubin;

- Not Equivalent Tests:
- Indications: The bilirubin test is used to check liver function and watch for signs of liver disease, such as hepatitis or cirrhosis, or the effects of medicines that can damage the liver. The test is also used to find out if something is blocking the bile ducts. This may occur if gallstones, tumors of the pancreas, or other conditions are present. Bilirubin tests are also used to diagnose conditions that cause increased destruction of red blood cells, such as hemolytic anemia or hemolytic disease of the newborn.
- Description: Bilirubin testing checks for levels of bilirubin — an orange-yellow pigment — in blood. Bilirubin results from the normal breakdown of red blood cells. As a normal process, bilirubin is carried in the blood and passes through your liver. Too much bilirubin may indicate liver damage or disease. Before reaching the liver, as a breakdown product of red blood cells, the bilirubin is called indirect (unconjugated) bilirubin. Once in the liver, most bilirubin attaches to certain sugars creating direct (conjugated) bilirubin. Direct bilirubin is released into bile and stored in the gallbladder before eventually being excreted in stool. Higher than normal levels of direct or indirect bilirubin may indicate different types of liver problems.
- Related Tests: Other tests related to liver function (alanine transaminase [ALT], aspartate transaminase [AST], alkaline phosphatase [ALP], albumin and total protein, gammaglutamyltransferase [GGT], lactate dehydrogenase [LDH], prothrombin time [PT]).
- Approximate Reference Range (Each site will have slight variations): 0.1 – 0.3 mg/dL or 1.7 – 5.1 mmol/L
- Comments: Bilirubin levels tend to be slightly higher in males than females, while African Americans show lower values. Strenuous exercise may also increase bilirubin levels.
- Test Method Variance: Urine levels of bilirubin may also be clinically significant.
- Other: It is not uncommon to see high bilirubin levels in newborns, typically 1 to 3 days old. This is sometimes called physiologic jaundice of the newborn. Within the first 24 hours of life, up to 50% of full-term newborns, and an even greater percentage of pre-term babies, may have a high bilirubin level. After birth, newborns begin breaking down the excess red blood cells

(RBCs) they are born with and, since the newborn's liver is not fully mature, it is unable to process the extra bilirubin, causing the infant's bilirubin levels to rise in the blood and other body tissues. This situation usually resolves itself within a few days. In other instances, newborns' red blood cells may be being destroyed because of blood incompatibilities between the baby and her mother, called hemolytic disease of the newborn.

  - Associated LOINC: 14629-0, 15152-2, 18264-2, 1968-7, 29760-6, 35191-6, 43820-0
  - Associated CPT: 82248

2. BILI_INDIR (Bilirubin, Indirect)

   - Common Name: Indirect Bilirubin
   - Long Name: Bilirubin, indirect/unconjugated/nonglucuronidated in blood/serum
   - Test Type: BILI_INDIR
   - Panels: Hepatic/Liver Function Panel
   - Equivalent Tests: Indirect bilirubin; unconjugated bilirubin
   - Not Equivalent Tests:
   - Indications: The bilirubin test is used to check liver function and watch for signs of liver disease, such as hepatitis or cirrhosis, or the effects of medicines that can damage the liver. The test is also used to find out if something is blocking the bile ducts. This may occur if gallstones, tumors of the pancreas, or other conditions are present. Bilirubin tests are also used to diagnose conditions that cause increased destruction of red blood cells, such as hemolytic anemia or hemolytic disease of the newborn.
   - Description: Bilirubin testing checks for levels of bilirubin — an orange-yellow pigment — in blood. Bilirubin results from the normal breakdown of red blood cells. As a normal process, bilirubin is carried in the blood and passes through your liver. Too much bilirubin may indicate liver damage or disease. Before reaching the liver, as a break-down product of red blood cells, the bilirubin is called indirect (unconjugated) bilirubin. Once in the liver, most bilirubin attaches to certain sugars creating what's called direct (conjugated) bilirubin. Direct bilirubin is released into bile and stored in the gallbladder before eventually being excreted in

stool. Higher than normal levels of direct or indirect bilirubin may indicate different types of liver problems.

- Related Tests: Other tests related to liver function (alanine transaminase [ALT], aspartate transaminase [AST], alkaline phosphatase [ALP], albumin and total protein, gammaglutamyltransferase [GGT], lactate dehydrogenase [LDH], prothrombin time [PT])
- Approximate Reference Range (Each site will have slight variations): 0.2 – 0.8 mg/dL or 3.4 – 12.0 mmol/L
- Comments: Bilirubin levels tend to be slightly higher in males than females, while African Americans show lower values. Strenuous exercise may also increase bilirubin levels.
- Test Method Variance:
- Other: It is not uncommon to see high bilirubin levels in newborns, typically 1 to 3 days old. This is sometimes called physiologic jaundice of the newborn. Within the first 24 hours of life, up to 50% of full-term newborns, and an even greater percentage of pre-term babies, may have a high bilirubin level. After birth, newborns begin breaking down the excess red blood cells (RBCs) they are born with and, since the newborn's liver is not fully mature, it is unable to process the extra bilirubin, causing the infant's bilirubin levels to rise in the blood and other body tissues. This situation usually resolves itself within a few days. In other instances, newborns' red blood cells may be being destroyed because of blood incompatibilities between the baby and her mother, called hemolytic disease of the newborn.
  - Associated LOINC: 14630-8, 15153-0,1970-3, 1971-1, 22665-4, 35192-4
  - Associated CPT:

3. BILI_TOT (Bilirubin, Total)

- Common Name: Total Bilirubin
- Long Name: Bilirubin, total in blood/serum
- Test Type: BILI_TOT
- Panels: Hepatic/Liver Function Panel
- Equivalent Tests: Total bilirubin; TBIL; Neonatal bilirubin

- Not Equivalent Tests: The following bilirubin tests are subsets (components) of total bilirubin but are not the same as total bilirubin and have separate TEST_TYPES: Direct bilirubin; Conjugated bilirubin; Indirect bilirubin; Unconjugated bilirubin.
- Indications: The bilirubin test is used to check liver function and watch for signs of liver disease, such as hepatitis or cirrhosis, or the effects of medicines that can damage the liver. The test is also used to find out if something is blocking the bile ducts. This may occur if gallstones, tumors of the pancreas, or other conditions are present. Bilirubin tests are also used to diagnose conditions that cause increased destruction of red blood cells, such as hemolytic anemia or hemolytic disease of the newborn.
- Description: Bilirubin testing checks for levels of bilirubin — an orange-yellow pigment — in blood. Bilirubin results from the normal breakdown of red blood cells. As a normal process, bilirubin is carried in the blood and passes through your liver. Too much bilirubin may indicate liver damage or disease. Before reaching the liver, as a break-down product of red blood cells, the bilirubin is called indirect (unconjugated) bilirubin. Once in the liver, most bilirubin attaches to certain sugars creating what's called direct (conjugated) bilirubin. Direct bilirubin is released into bile and stored in the gallbladder before eventually being excreted in stool. Higher than normal levels of direct or indirect bilirubin may indicate different types of liver problems. Total bilirubin is indirect plus direct bilirubin plus various amounts of uncommon bilirubin subsets all combined into the total bilirubin measurement.
- Related Tests: Other tests related to liver function (alanine transaminase [ALT], aspartate transaminase [AST], alkaline phosphatase [ALP], albumin and total protein, gammaglutamyltransferase [GGT], lactate dehydrogenase [LDH], prothrombin time [PT])
- Approximate Reference Range (Each site will have slight variations): 0.3 – 1.0 mg/dL or 5.1 – 17.0 mmol/L
  - Normal Values in Newborns: Normal values in newborns depend on the age of the baby in hours and whether the baby was premature or full term. Normal values may vary from lab to lab.
    * Total bilirubin levels in newborns less than 7 days old
    * Age Premature baby Full-term baby

        * Less than 24 hours $<$ 8.0 mg/dL ($<$ 137 mmol/L) $<$ 6.0 mg/dL ($<$ 103 mmol/L)
        * Less than 48 hours $<$ 12.0 mg/dL ($<$ 205 mmol/L) $<$ 10.0 mg/dL ($<$ 170 mmol/L)
        * 3 to 5 days $<$ 15.0 mg/dL ($<$ 256 mmol/L) $<$ 12.0 mg/dL ($<$ 205 mmol/L)
        * 7 days or older $<$ 15.0 mg/dL ($<$ 256 mmol/L) $<$ 10.0 mg/dL ($<$ 170 mmol/L)
    - Comments: Bilirubin levels tend to be slightly higher in males than females, while African Americans show lower values. Strenuous exercise may also increase bilirubin levels.
    - Test Method Variance:
    - Other: It is not uncommon to see high bilirubin levels in newborns, typically 1 to 3 days old. This is sometimes called physiologic jaundice of the newborn. Within the first 24 hours of life, up to 50% of full-term newborns, and an even greater percentage of pre-term babies, may have a high bilirubin level. After birth, newborns begin breaking down the excess red blood cells (RBCs) they are born with and, since the newborn's liver is not fully mature, it is unable to process the extra bilirubin, causing the infant's bilirubin levels to rise in the blood and other body tissues. This situation usually resolves itself within a few days. In other instances, newborns' red blood cells may be being destroyed because of blood incompatibilities between the baby and her mother, called hemolytic disease of the newborn.
        - Associated LOINC: 14631-6, 1975-2, 33898-8, 33899-6, 35194-0, 42719-5, 54363-7, 59827-6, 59828-4, 77137-8, 89871-8, 89872-6, 97770-2
        - Associated CPT: 82247

1.1.9 BNP (Brain Natriuretic Peptide)

- Common Name: BNP
- Long Name: Natriuretic Peptide B or B-type; Brain Natriuretic Peptide
- Test Type: BNP

Panels: N/A

- Equivalent Tests: N/A

Not Equivalent Tests: N-Terminal-ProBNP

- Indications: To help diagnose the presence and severity of heart failure. BNP levels can assist

in differentiating between heart failure and other problems, such as lung disease. Description: This test measures the concentration of BNP in the blood. The heart normally produces low levels of a precursor protein, pro-BNP, which is cleaved to release the active hormone BNP and an inactive fragment, NT-proBNP. The purpose of BNP is to help regulate blood volume and, therefore, the work the heart must do in pumping blood throughout the body. BNP is produced mainly in the heart's left ventricle (the organ's main pumping chamber). When the left ventricle is stretched from having to work harder, the concentrations of BNP in blood can increase markedly. This situation may occur in heart failure as well as other diseases that affect the heart and circulatory system. Higher-than-normal results suggest that a person is in heart failure, and the level of BNP in the blood is related to the severity of heart failure. Higher levels of BNP also may be associated with a worse prognosis for the patient. Related Tests: N-Terminal-ProBNP; Cardiac biomarkers such as CK and Troponin.

- Approximate Reference Range: Normal $<$ 100pg/ml
- Comments: BNP levels decrease in most patients who have been taking drug therapies for

heart failure. Levels of BNP tend to increase with age and are increased in persons with kidney disease.

- Test Method Variance:

Other:

1.1.10 BNP_PROHORMONE (Natriuretic peptide.B prohormone N-Terminal)

NEEDS TO BE UPDATED

1.1.11 BUN (Urea nitrogen in blood/serum)

- Common Name: BUN

- Long Name: Urea nitrogen in blood/serum
- Test Type: BUN
- Panels: Basic Metabolic Panel (BMP); Comprehensive Metabolic Panel (CMP)
- Equivalent Tests: N/A
- Not Equivalent Tests: Urine urea nitrogen
- Indications: To evaluate kidney function or monitor the effectiveness of dialysis and other treatments related to kidney disease or damage. BUN is also used to evaluate general health status when ordered as part of a basic metabolic panel or comprehensive metabolic panel.
- Description: BUN measures the amount of urea nitrogen in the blood. Nitrogen, in the form of ammonia, is produced in the liver when protein is broken into its component parts (amino acids) and metabolized. The nitrogen combines with other molecules in the liver to form the waste product urea. Urea is then released into the bloodstream and carried to the kidneys where it is filtered out of the blood and excreted in the urine. Because this is an ongoing process, there is normally a small but stable amount of urea nitrogen in the blood. Most diseases or conditions that affect the kidneys or liver have the potential to affect the amount of urea present in the blood. If increased amounts of urea are produced by the liver or decreased amounts are excreted by the kidneys, then blood urea nitrogen concentrations will rise. If significant liver damage or disease inhibits the production of urea, then BUN concentrations may fall.
- Related Tests: Creatinine; Creatinine Clearance; eGFR; CMP; BMP; Urinalysis; Microalbumin
- Approximate Reference Range (As the BUN reference range is lab specific, there is no "standard" BUN reference range): Approximately = 6-23 mg/dL.
- Comments: BUN levels increase with age. BUN levels in very young babies are about 2/3 of the levels found in healthy young adults, while levels in adults over 60 years of age are slightly higher than in younger adults. Levels are also slightly higher in men than women. Both decreased and increased BUN concentrations may be seen during a

normal pregnancy. If one kidney is fully functional, BUN concentrations may be normal even when significant dysfunction is present in the other kidney.

- Test Method Variance:
- Other:
  - Associated LOINC: 12961-9, 12962-7, 12963-5, 14937-7, 3094-0, 35234-4, 59570-2, 6299-2
  - Associated CPT: 84520, 84525

1.1.12 (CA) Cancer Antigen Test Types

1. CA125 (Cancer Antigen 125), Quantitative in Blood
   - Common Name: CA125
   - Long Name: Cancer Antigen 125
   - Test Type: CA125
   - Panels:
   - Equivalent Tests: Blood CA125
   - Not Equivalent Tests:
   - Indications: A doctor may order a CA-125 test before a woman starts ovarian cancer treatment as a baseline to compare against future measurements. During therapy, physicians order CA-125 testing at intervals to monitor response to therapy. CA-125 may also be measured periodically after therapy is completed. An increase in CA-125 may indicate that the cancer has returned.
   - Description: CA-125 is primarily used to monitor therapy during treatment for ovarian cancer. CA-125 is also used to detect whether cancer has come back after treatment is complete. Series of CA-125 tests that show rising or falling concentrations are often more useful than a single result. This test is sometimes used to test and monitor high-risk women who have a family history of ovarian cancer but who do not yet have the disease. This test is not used to screen for ovarian cancer because it is non-specific. Levels in the blood can be elevated in other conditions such as normal menstruation, pregnancy, endometriosis, and pelvic inflammatory disease.

- Related Tests: Tumor markers, BRCA-1, BRCA-2
- Approximate Reference Range (Each site will have slight variations): Normal range less that 35 U/ml
- Comments: If CA-125 levels fall during therapy, this generally indicates that the cancer is responding to treatment. If CA-125 levels rise or stay the same, then the cancer may not be responding to therapy. High CA-125 levels after treatment is complete may indicate that the cancer has come back. If a woman who has been diagnosed with ovarian cancer has a baseline CA-125 level that is normal, then the test is not likely to be useful to monitor her ovarian cancer. In this case, the ovarian cancer may not be producing CA-125 so it is not a good marker of disease progression.
- Test Method Variance:
- Other:
  - Associated LOINC: 10334-1, 83082-8
  - Associated CPT: 86304

2. CA125_BF (Cancer Antigen 125), Quantitative in Body Fluid

   - Common Name: CA125 in body fluid
   - Long Name: CA 125 Body Fluid
   - Test Type: CA125_BF
   - Panels:
   - Equivalent Tests:
   - Not Equivalent Tests:
   - Indications: A doctor may order a CA-125 test before a woman starts ovarian cancer treatment as a baseline to compare against future measurements. During therapy, physicians order CA-125 testing at intervals to monitor response to therapy. CA-125 may also be measured periodically after therapy is completed. An increase in CA-125 may indicate that the cancer has returned.
   - Description: CA-125 is primarily used to monitor therapy during treatment for ovarian cancer. CA-125 is also used to detect whether cancer has come back after treatment is complete. Series of CA-125 tests that show rising or falling concentrations are often more useful than a single result. This test is sometimes used

to test and monitor high-risk women who have a family history of ovarian cancer but who do not yet have the disease. This test is not used to screen for ovarian cancer because it is non-specific. Levels in the blood can be elevated in other conditions such as normal menstruation, pregnancy, endometriosis, and pelvic inflammatory disease.

- Related Tests: Tumor markers, BRCA-1, BRCA-2
- Approximate Reference Range (Each site will have slight variations):
- Comments: If CA-125 levels fall during therapy, this generally indicates that the cancer is responding to treatment. If CA-125 levels rise or stay the same, then the cancer may not be responding to therapy. High CA-125 levels after treatment is complete may indicate that the cancer has come back. If a woman who has been diagnosed with ovarian cancer has a baseline CA-125 level that is normal, then the test is not likely to be useful to monitor her ovarian cancer. In this case, the ovarian cancer may not be producing CA-125 so it is not a good marker of disease progression.
- Test Method Variance:
- Other:
  - Associated LOINC: 11210-2 (body fluid), 19165-0 (pleural) ,40618-1 (peritoneal), 50775-6 (CSF), 68923-2 (pericard)
  - Associated CPT: 86304

3. CA125_BF_T (Cancer Antigen 125) Titer in Body Fluid

- Common Name: CA125 titer in body fluid
- Long Name: CA 125 Titer, Body Fluid
- Test Type: CA125_BF_T
- Panels:
- Equivalent Tests:
- Not Equivalent Tests:
- Indications: A doctor may order a CA-125 test before a woman starts ovarian cancer treatment as a baseline to compare against future measurements. During therapy, physicians order CA-125 testing at intervals to monitor response to therapy. CA-125 may

also be measured periodically after therapy is completed. An increase in CA-125 may indicate that the cancer has returned.

- Description: CA-125 is primarily used to monitor therapy during treatment for ovarian cancer. CA-125 is also used to detect whether cancer has come back after treatment is complete. Series of CA-125 tests that show rising or falling concentrations are often more useful than a single result. This test is sometimes used to test and monitor high-risk women who have a family history of ovarian cancer but who do not yet have the disease. This test is not used to screen for ovarian cancer because it is non-specific. Levels in the blood can be elevated in other conditions such as normal menstruation, pregnancy, endometriosis, and pelvic inflammatory disease.
- Related Tests: Tumor markers, BRCA-1, BRCA-2
- Approximate Reference Range (Each site will have slight variations):
- Comments: If CA-125 levels fall during therapy, this generally indicates that the cancer is responding to treatment. If CA-125 levels rise or stay the same, then the cancer may not be responding to therapy. High CA-125 levels after treatment is complete may indicate that the cancer has come back. If a woman who has been diagnosed with ovarian cancer has a baseline CA-125 level that is normal, then the test is not likely to be useful to monitor her ovarian cancer. In this case, the ovarian cancer may not be producing CA-125 so it is not a good marker of disease progression.
- Test Method Variance:

Other:

- Associated LOINC: 15156-3
- Associated CPT: 86304

4. CA125_T (Cancer Antigen 125), Titer in Blood

- Common Name: CA125 titer
- Long Name: CA 125 titer
- Test Type: CA125_T
- Panels:

- Equivalent Tests:
- Not Equivalent Tests:
- Indications: A doctor may order a CA-125 test before a woman starts ovarian cancer treatment as a baseline to compare against future measurements. During therapy, physicians order CA-125 testing at intervals to monitor response to therapy. CA-125 may also be measured periodically after therapy is completed. An increase in CA-125 may indicate that the cancer has returned.
- Description: CA-125 is primarily used to monitor therapy during treatment for ovarian cancer. CA-125 is also used to detect whether cancer has come back after treatment is complete. Series of CA-125 tests that show rising or falling concentrations are often more useful than a single result. This test is sometimes used to test and monitor high-risk women who have a family history of ovarian cancer but who do not yet have the disease. This test is not used to screen for ovarian cancer because it is non-specific. Levels in the blood can be elevated in other conditions such as normal menstruation, pregnancy, endometriosis, and pelvic inflammatory disease.
- Related Tests: Tumor markers, BRCA-1, BRCA-2
- Approximate Reference Range (Each site will have slight variations):
- Comments: If CA-125 levels fall during therapy, this generally indicates that the cancer is responding to treatment. If CA-125 levels rise or stay the same, then the cancer may not be responding to therapy. High CA-125 levels after treatment is complete may indicate that the cancer has come back. If a woman who has been diagnosed with ovarian cancer has a baseline CA-125 level that is normal, then the test is not likely to be useful to monitor her ovarian cancer. In this case, the ovarian cancer may not be producing CA-125 so it is not a good marker of disease progression.
- Test Method Variance:
- Other:
  - Associated LOINC: 15157-1
  - Associated CPT: 86304

5. CA125_QL (Cancer Antigen 125), Qualitative in Blood

- Common Name: CA125
- Long Name: CA 125 Qualitative
- Test Type: CA125_QL
- Panels:
- Equivalent Tests:
- Not Equivalent Tests:
- Indications: A doctor may order a CA-125 test before a woman starts ovarian cancer treatment as a baseline to compare against future measurements. During therapy, physicians order CA-125 testing at intervals to monitor response to therapy. CA-125 may also be measured periodically after therapy is completed. An increase in CA-125 may indicate that the cancer has returned.
- Description: CA-125 is primarily used to monitor therapy during treatment for ovarian cancer. CA-125 is also used to detect whether cancer has come back after treatment is complete. Series of CA-125 tests that show rising or falling concentrations are often more useful than a single result. This test is sometimes used to test and monitor high-risk women who have a family history of ovarian cancer but who do not yet have the disease. This test is not used to screen for ovarian cancer because it is non-specific. Levels in the blood can be elevated in other conditions such as normal menstruation, pregnancy, endometriosis, and pelvic inflammatory disease.
- Related Tests: Tumor markers, BRCA-1, BRCA-2
- Approximate Reference Range (Each site will have slight variations): Not applicable (qualitative test)
- Comments: If CA-125 levels fall during therapy, this generally indicates that the cancer is responding to treatment. If CA-125 levels rise or stay the same, then the cancer may not be responding to therapy. High CA-125 levels after treatment is complete may indicate that the cancer has come back. If a woman who has been diagnosed with ovarian cancer has a baseline CA-125 level that is normal, then the test is not likely to be useful to monitor her ovarian cancer. In this case, the ovarian cancer may not be producing CA-125 so it is not a good marker of disease progression.
- Test Method Variance:

- Other:
  - Associated LOINC: 2006-5
  - Associated CPT: 86304

6. CA15_3 (Cancer Ag 15-3 Qn) ***NEEDS TO BE UPDATED***
7. CA15_3_QL (Cancer Ag 15-3 Ql) ***NEEDS TO BE UPDATED***
8. CA199 (Cancer Ag 19-9) ***NEEDS TO BE UPDATED***
9. CA27_29 (Cancer Ag 27-29 Qn) ***NEEDS TO BE UPDATED***
10. CA27_29_QL (Cancer Ag 27-29 Ql) ***NEEDS TO BE UPDATED***

1.1.13 CALCIUM (Total Serum Calcium)

- Common Name: Total serum calcium; Ca++
- Long Name: Calcium, total in serum/blood
- Test Type: CALCIUM
- Panels: Basic metabolic profile, comprehensive metabolic profile, general health panel, renal function panel
- Equivalent Tests:
- Not Equivalent Tests: Free calcium; ionized calcium; body fluids other than blood (i.e. urine)
- Indications: To screen for, diagnose, and monitor a range of conditions relating to the bones, heart, nerves, kidneys, and parathyroid glands; also monitored in certain types of cancer. Certain drugs can affect calcium levels.
- Description:
- Related Tests:
- Approximate Reference Range (Each site will have slight variations): ~ 9.0-10.5 mg/dl
- Comments: Blood levels of total calcium may be affected by levels of protein in the blood, since calcium in the blood is attached to albumin; ionized calcium is not attached to albumin. Certain antacids and calcium supplements may affect levels.

- Test Method Variance:
- Other:
  - Associated LOINC: 17861-6, 1996-8, 2000-8, 35246-8, 42593-4, 42857-3, 49765-1
  - Associated CPT: 82310

1.1.14 CEA (Carcinoembryonic Ag)

NEEDS TO BE UPDATED

1.1.15 CHLORIDE (Chloride, total)

NEEDS TO BE UPDATED

1.1.16 (CK) Creatine Kinase Test Types

1. CK (Creatine Kinase)
   - Common Name: CK
   - Long Name: Creatine Kinase or CPK - total concentration in blood of all CK subtypes
   - Test Type: CK
   - Panels: N/A
   - Equivalent Tests: N/A
   - Not Equivalent Tests: BNP; Troponin
   - Indications: Blood levels of CK rise when muscle or heart cells are injured. This test is used if a patient has chest pain or other signs and symptoms of a heart attack. In the first 4 to 6 hours after a heart attack, the concentration of CK in blood begins to rise. It reaches its highest level in 18 to 24 hours and returns to normal within 2 to 3 days. This test is also used to monitor skeletal muscles damage.
   - Description: Creatine kinase is an enzyme found in the heart, brain, skeletal muscle, and other tissues. Enzymes are proteins that help cells to perform their normal functions. In muscle and heart cells, most of this energy is used when muscles contract. There are three different forms (or isoenzymes) of CK: CK-MM (found in skeletal muscles and heart); CK-MB (found mostly in

the heart); and CK-BB (found mostly in the brain). The small amount of CK that is normally in the blood comes mainly from muscles and not the brain.

- Related Tests: CK_MB; CK_MB; CK_BB_EP, CK_BBI, CK_BBI_EP; CK_BF, CK_CSF; CK_ISO; CK_ISO_EP; CK_MB; CK_MB_EIA; CK_MB_EP; CK_MBI_CLC; CK_MBI_EIA; CK_MBI_EP; CK_MM_EP; CK_MMI; CK_MMI_EP; CK_QN; Troponin; BNP
- Approximate Reference Range (Normal values vary from lab to lab and from one type of testing protocol to another): Male: 38 - 174 units/L; Female: 96 - 140 units/L
- Comments: People who have greater muscle mass have higher CK levels than those who do not. African-Americans may have higher CK levels than other racial/ethnic groups. Very heavy exercise can also increase CK. Other forms of muscle damage, such as from a fall, a car accident, surgery, or an injection, can also increase CK. Several drugs, including cholesterol-lowering drugs (statins), can damage muscle and increase CK. Drinking excessive amounts of alcohol also may increase CK. Early pregnancy can decrease CK levels.
- Test Method Variance:
- Other:
  - Associated LOINC: 2157-6, 24335-2, 50756-6
  - Associated CPT: 82550

2. CK_BB_EP (Creatine Kinase BB Electrophoresis) NOTE: This single reference document contains information pertinent to the individual TEST_TYPES CK_BB_EP, and the indexes CK_BBI, or CK_BBI_EP.

   - Common Name: CK BB (also known as CPK BB)
   - Long Name: Creatine Kinase BB (Brain-type)
   - Test Type: CK_BB_EP is CK_BB by the testing method electrophoresis
     - CK_BBI is the Creatine Kinase BB/Creatine Kinase Total as a ratio or index
     - CK_BBI_EP is the Creatine Kinase BB/Creatine Kinase Total as a ratio or index by the testing method electrophoresis

- Panels: N/A
- Equivalent Tests: N/A
- Not Equivalent Tests: All other CK TEST_TYPES that do not contain "BB" in name.
- Indications: Blood levels of CK rise when muscle, brain or heart cells are injured. CK_BB is found primarily in the brain. CK_BB is sometimes used in diagnosing of cancer of the lung and stomach. However, CK_BB is expressed in all tissues at low levels and has little clinical relevance.
- Description: CK_BB is one of three separate forms (isoenzymes) of the enzyme creatine kinase (CK). CK_BB is found mostly in the brain, lungs, intestinal tract and smooth muscle.
- Related Tests: CK; CK_BB_EP, CK_BBI, CK_BBI_EP; CK_CSF; CK_ISO; CK_ISO_EP
- Approximate Reference Range:
- Comments: $<$ 1% of total CK
- Test Method Variance:
- Other:
  - Associated LOINC: 2152-7
  - Associated CPT: 82552, 82554

3. CK_BBI (Creatine Kinase BB Total) ***NEEDS TO BE UPDATED***

   NOTE: This single reference document contains information pertinent to the individual TEST_TYPEs CK_BB_EP, and the indexes CK_BBI, or CK_BBI_EP.

   - Common Name: CK BB (also known as CPK BB)
   - Long Name: Creatine Kinase BB (Brain-type)
   - Test Type: CK_BBI is the Creatine Kinase BB/Creatine Kinase Total as a ratio or index CK_BBI_EP is the Creatine Kinase BB/Creatine Kinase Total as a ratio or index by the testing method electrophoresis
   - Panels: N/A
   - Equivalent Tests: N/A
   - Not Equivalent Tests: All other CK TEST_TYPES that do not contain "BB" in name.

- Indications: Blood levels of CK rise when muscle, brain or heart cells are injured. CK_BB isfound primarily in the brain. CK_BB is sometimes used in diagnosing of cancer of the lung andstomach. However, CK_BB is expressed in all tissues at low levels and has little clinicalrelevance.
- Description: CK_BB is one of three separate forms (isoenzymes) of the enzyme creatinekinase (CK). CK_BB is found mostly in the brain, lungs, intestinal tract and smooth muscle.
- Related Tests: CK; CK_BB_EP, CK_BBI, CK_BBI_EP; CK_CSF; CK_ISO; CK_ISO_EP
- Approximate Reference Range:
- Comments: $<$ 1% of total CK
- Test Method Variance:
- Other:
  - Associated LOINC:
  - Associated CPT:

4. CK_BBI_EP (Creatine Kinase BB Total Electrophoresis) ***NEEDS TO BE UPDATED***

   NOTE: This single reference document contains information pertinent to theindividual TEST_TYPES CK_BB_EP, and the indexes CK_BBI, or CK_BBI_EP.

   - Common Name: CK BB (also known as CPK BB)
   - Long Name: Creatine Kinase BB (Brain-type)
   - Test Type: CK_BB_EP is CK_BB by the testing method electrophoresis CK_BBI is the Creatine Kinase BB/Creatine Kinase Total as a ratio or indexCK_BBI_EP is the Creatine Kinase BB/Creatine Kinase Total as a ratio or index by the testing-method electrophoresis
   - Panels: N/A
   - Equivalent Tests: N/A
   - Not Equivalent Tests: All other CK TEST_TYPES that do not contain "BB" in name.
   - Indications: Blood levels of CK rise when muscle, brain or heart cells are injured. CK_BB isfound primarily in the brain. CK_BB

is sometimes used in diagnosing of cancer of the lung andstomach. However, CK_BB is expressed in all tissues at low levels and has little clinicalrelevance.

- Description: CK_BB is one of three separate forms (isoenzymes) of the enzyme creatinekinase (CK). CK_BB is found mostly in the brain, lungs, intestinal tract and smooth muscle.
- Related Tests: CK; CK_BB_EP, CK_BBI, CK_BBI_EP; CK_CSF; CK_ISO; CK_ISO_EP
- Approximate Reference Range:
- Comments: $<$ 1% of total CK
- Test Method Variance:
- Other:
  - Associated LOINC:
  - Associated CPT:

5. CK_BF (Creatine Kinase Body Fluid Quantitative) ***NEEDS TO BE UPDATED*** NOTE: This single reference document contains information pertinent to theindividual TEST_TYPES CK_BB_EP, and the indexes CK_BBI, or CK_BBI_EP.

   - Common Name: CK BB (also known as CPK BB)
   - Long Name: Creatine Kinase BB (Brain-type)
   - Test Types: CK_BB_EP is CK_BB by the testing method electrophoresisCK_BBI is the Creatine Kinase BB/Creatine Kinase Total as a ratio or indexCK_BBI_EP is the Creatine Kinase BB/Creatine Kinase Total as a ratio or index by the testing-method electrophoresis
   - Panels: N/A
   - Equivalent Tests: N/A
   - Not Equivalent Tests: All other CK TEST_TYPES that do not contain "BB" in name.
   - Indications: Blood levels of CK rise when muscle, brain or heart cells are injured. CK_BB is found primarily in the brain. CK_BB is sometimes used in diagnosing of cancer of the lung andstomach. However, CK_BB is expressed in all tissues at low levels and has little clinicalrelevance.

- Description: CK_BB is one of three separate forms (isoenzymes) of the enzyme creatinekinase (CK). CK_BB is found mostly in the brain, lungs, intestinal tract and smooth muscle.
- Related Tests: CK; CK_BB_EP, CK_BBI, CK_BBI_EP; CK_CSF; CK_ISO; CK_ISO_EP
- Approximate Reference Range:
- Comments: $<$ 1% of total CK
- Test Method Variance:
- Other:
  - Associated LOINC:
  - Associated CPT:

6. CK_CSF (Creatine Kinase CSF Quantitative)

   - Common Name: CSF CK
   - Long Name: Creatine Kinase in Cerebral Spinal Fluid
   - Test Type: CK_CSF
   - Panels: N/A
   - Equivalent Tests: N/A
   - Not Equivalent Tests: All other CK TEST_TYPES.
   - Indications: CK activity in CSF is indicative of cerebral injury (brain damage).
   - Description: Creatine kinase is an enzyme found in the heart, brain, skeletal muscle, and other tissues. For more information on CK total, refer to CK information document.
   - Related Tests: CK; CK_MB; CK_MB; CK_BB_EP, CK_BBI, CK_BBI_EP; CK_BF, CK_ISO; CK_ISO_EP; CK_MB; CK_MB_EIA; CK_MB_EP; CK_MBI_CLC; CK_MBI_EIA; CK_MBI_EP;CK_MM_EP; CK_MMI; CK_MMI_EP; CK_QN
   - Approximate Reference Range:
   - Comments: Creatine kinase is not normally present in cerebrospinal fluid (CSF).
   - Test Method Variance:
   - Other:
     - Associated LOINC: 2151-9

- Associated CPT: 82550

7. CK_ISO (Creatine Kinase Isoenzymes) ***NEEDS TO BE UPDATED*** Creatine Kinase Isoenzymes Interpretation - analytic method not specified

8. CK_ISO_EP (Creatine Kinase Isoenzymes Electrophoresis) ***NEEDS TO BE UPDATED*** Creatine Kinase Isoenzymes Interpretation - analytic method not specified

9. CK_MB (Creatine Kinase MB - analytic method not specified)

   - Common Name: CK_MB (also known as CPK MB)
   - Long Name: Creatine Kinase-MB
   - Test Type: CK_MB
   - Panels: N/A
   - Equivalent Tests: Use this TEST_TYPE ONLY when the analytic method is not specified in the lab data.
   - Not Equivalent Tests: All other CK TEST_TYPES.
   - Indications: B lood levels of CK rise when muscle or heart cells are injured. CK_MB levels (along with total CK) are tested in persons who have chest pain to diagnose if they have had a heart attack. Since a high total CK could indicate damage to either the heart or other muscles, CK_MB helps to distinguish between these two sources.
   - Description: CK–MB is one of three separate forms (isoenzymes) of the enzyme creatine kinase. CK–MB is found mostly in heart muscle. It rises when there is damage to heart muscle cells.
   - Related Tests: CK; CK_MB; CK_BB_EP, CK_BBI, CK_BBI_EP; CK_BF, CK_CSF; CK_ISO; CK_ISO_EP; CK_MB; CK_MB_EIA; CK_MB_EP; CK_MBI_CLC; CK_MBI_EIA; CK_MBI_EP; CK_MM_EP; CK_MMI; CK_MMI_EP; CK_QN; Troponin; BNP
   - Approximate Reference Range: Normal CK-MB is 5% or less of total CK, often 5 – 25 IU/L.
   - Comments: If the value of CK_MB is elevated and the ratio of CK_MB to total CK (relativeindex) is high, it is likely that the heart was damaged. A high CK with a low relative index suggests

that skeletal muscles were damaged. Although CK_MB is a good test, it has been largely replaced by troponin, which is more specific for damage to the heart. Sometimes persons who are having trouble breathing have to use their chest muscles. Chest muscles have more CK_MB than other muscles, which would raise the amount of CK_MB in the blood. Persons whose kidneys have failed can also have high CK_MB levels without having had a heart attack. Rarely, chronic muscle disease, low thyroid hormone levels, and alcohol abuse can increase CK_MB, producing changes similar to those seen in aheart attack.

- Test Method Variance: Can be measured by test methods such as enzyme immunoassay, column chromatography, or electrophoresis. If the test method is specified, that TEST_TYPE should be used rather than CK_MB.
- Other:
  - Associated LOINC: 101446-3, 13969-1, 32673-6, 49551-5, 6773-6, 83092-7
  - Associated CPT: 82553

10. CK_MB_EIA (Creatine Kinase MB – Enzyme Immunoassay) ***NEEDS TO BE UPDATED***

    - Common Name: CK_MB by immunoassay (also known as CPK MB)
    - Long Name: Creatine Kinase MB – Enzyme Immunoassay
    - Test Type: CK_MB_EIA
    - Panels: N/A
    - Equivalent Tests: Use the TEST_TYPE only when the test method is stated to be enzyme immunoassay
    - Not Equivalent Tests: All other CK TEST_TYPES.
    - Indications: Blood levels of CK rise when muscle or heart cells are injured. CK_MB levels,along with total CK, are tested in persons who have chest pain to diagnose whether they have had a heart attack. Since a high total CK could indicate damage to either the heart or other muscles, CK_MB helps to distinguish between these two sources.

- Description: CK_MB is one of three separate forms (isoenzymes) of the enzyme creatine kinase (CK). CK_MB is found mostly in heart muscle. It rises when there is damage to heartmuscle cells.
- Related Tests: CK; CK_MB; CK_BB_EP, CK_BBI, CK_BBI_EP; CK_BF, CK_CSF; CK_ISO; CK_ISO_EP; CK_MB; CK_MB_EP; CK_MBI_CLC; CK_MBI_EIA; CK_MBI_EP; CK_MM_EP; CK_MMI; CK_MMI_EP; CK_QN; Troponin; BNP
- Approximate Reference Range: Normal CK-MB is 5% or less of CK, often 5 to 25 IU/L.
- Comments: If the value of CK_MB is elevated and the ratio of CK_MB to total CK (relative index) is high, it is likely that the heart was damaged. A high CK with a low relative index suggests that skeletal muscles were damaged.Although CK-MB is a good test, it has been largely replaced by troponin, which is more specific for damage to the heart. Persons whose kidneys have failed or who are having trouble breathing can have high CK_MB levels without having had a heart attack. Rarely, chronic muscle disease, low thyroid hormone levels, and alcohol abuse can increase CK_MB, producing changes similar to those seen in a heart attack.
- Test Method Variance: Separation of CK into isoenzymes may be accomplished by electrophoresis, column chromatography, or immunoassay. Immunoassay methods for isoenzymes can be accomplished rapidly, are highly sensitive and specific, and do not show the interferences common to traditional electrophoresis.
- Other:
  - Associated LOINC:
  - Associated CPT: 82553

11. CK_MB_EP (Creatine Kinase MB - Electrophoresis)

    - Common Name: CK_MB by electrophoresis (also known as CPK MB)
    - Long Name: Creatine Kinase MB - Electrophoresis
    - Test Type: CK_MB_EP
    - Panels: N/A
    - Equivalent Tests: Use this TEST_TYPE only when the test method is stated to beelectrophoresis.

- Not Equivalent Tests: All other CK TEST_TYPES.
- Indications: Blood levels of CK rise when muscle or heart cells are injured. CK_MB levels,along with total CK, are tested in persons who have chest pain to diagnose whether they have had a heart attack. Since a high total CK could indicate damage to either the heart or other muscles, CK_MB helps to distinguish between these two sources.
- Description: CK_MB is one of three separate forms (isoenzymes) of the enzyme creatine kinase (CK). CK_MB is found mostly in heart muscle. It rises when there is damage to heart muscle cells.
- Related Tests: CK; CK_MB; CK_BB_EP, CK_BBI, CK_BBI_EP; CK_BF, CK_CSF; CK_ISO; CK_ISO_EP; CK_MB; CK_MB_EIA; CK_MBI_CLC; CK_MBI_EIA; CK_MBI_EP; CK_MM_EP;CK_MMI; CK_MMI_EP; CK_QN; Troponin; BNP
- Approximate Reference Range: Normal CK-MB is 5% or less of CK, or 5 to 25 IU/L.
- Comments: If the value of CK_MB is elevated and the ratio of CK_MB to total CK (relative index) is high, it is likely that the heart was damaged. A high CK with a low relative index suggests that skeletal muscles were damaged.Although CK-MB is a good test, it has been largely replaced by troponin, which is more specific for damage to the heart. Persons whose kidneys have failed or who are having trouble breathing can have high CK–MB levels without having had a heart attack. Rarely, chronic muscle disease, low thyroid hormone levels, and alcohol abuse can increase CK–MB, producing changes similar to those seen in a heart attack.
- Test Method Variance: Separation of CK into isoenzymes may be accomplished by electrophoresis, column chromatography, or immunoassay. Electrophoretically, CK_BB is most mobile, CK_MB is intermediate, and CK_MM is neutral. Although electrophoresis is possiblyless sensitive than column chromatography or immunoassay, there has been extensiveexperience and it is adequate for routine clinical use.
- Other:
  - Associated LOINC: 2154-3
  - Associated CPT: 82553

12. CK_MBI_CLC (Creatine Kinase MB/Creatine Kinase Total Calculated)

    - Common Name: CK_MB / CK (calculated ratio)
    - Long Name: Creatine Kinase MB/Creatine Kinase Total Calculated
    - Test Type: CK_MBI_CLC
    - Panels: N/A
    - Equivalent Tests: Use this TEST_TYPE only when the result is a ratio of CK_MB to CK total asa calculated ratio.
    - Not Equivalent Tests: All other CK tests.
    - Indications: Blood levels of CK rise when muscle or heart cells are injured. CK_MB levels,along with total CK, are tested in persons who have chest pain to diagnose whether they have had a heart attack. Since a high total CK could indicate damage to either the heart or other muscles, the ratio of CK_MB to total CK helps to distinguish between these two sources.
    - Description: CK_MB is one of three separate forms (isoenzymes) of the enzyme creatine kinase (CK). CK_MB is found mostly in heart muscle. It rises when there is damage to heart muscle cells. This test is the calculated ratio (or relative index) of the CK_MB to the total amount of the three CK isoenzymes.
    - Related Tests: CK; CK_MB; CK_BB_EP, CK_BBI, CK_BBI_EP; CK_BF, CK_CSF; CK_ISO; CK_ISO_EP; CK_MB; CK_MB_EIA; CK_MB_EP; CK_MBI_EIA; CK_MBI_EP; CK_MM_EP;CK_MMI; CK_MMI_EP; CK_QN; Troponin; BNP
    - Approximate Reference Range: If the calculated ratio of CK_MB to the total CK (relativeindex) is more than 2.5 – 3 (some say more than 5), it is likely that the source is cardiac (and that the heart was damaged). Ratios between 3 and 5 represent a gray zone. A ratio less than 2.5 – 3 is consistent with a skeletal muscle source.
    - Comments: CK_MB to total CK (often multiplied by 100) can assist in differentiating false positive elevations of CK_MB arising from skeletal muscle. No definitive diagnosis can be established without serial determinations to detect a rise.
    - Test Method Variance:
    - Other:

- Associated LOINC: 12188-9, 12189-7, 20569-0, 49136-5, 72564-8
- Associated CPT: 82550, 82553

13. CK_MBI_EIA (Creatine Kinase MB/Creatine Kinase Total Enzyme Immunoassay) ***NEEDS TO BE UPDATED***

    - Common Name: CK_MB/CK (ratio determined by enzyme immunoassay)
    - Long Name: Creatine Kinase MB/Creatine Kinase Total Enzyme Immunoassay
    - Test Type: CK_MBI_EIA
    - Panels: N/A
    - Equivalent Tests: Use this TEST_TYPE only when the result is a ratio of CK_MB to CK total

    determined by enzyme immunoassay (EIA).

    - Not Equivalent Tests: All other CK tests.
    - Indications: Blood levels of CK rise when muscle or heart cells are injured. CK_MB levels,along with total CK, are tested in persons who have chest pain to diagnose whether they have had a heart attack. Since a high total CK could indicate damage to either the heart or othermuscles, the ratio of CK_MB to total CK helps to distinguish between these two sources.
    - Description: CK_MB is one of three separate forms of CK. CK_MB is found mostly in heart muscle. It rises when there is damage to heart muscle cells. Separation of CK into isoenzymes may be accomplished by electrophoresis, column chromatography, or immunoassay.Immunoassay methods for isoenzymes can be accomplished rapidly and is highly sensitive andspecific. Further, it does not show the interferences common to traditional electrophoresis.
    - Related Tests: CK; CK_MB; CK_BB_EP, CK_BBI, CK_BBI_EP; CK_BF, CK_CSF; CK_ISO; CK_ISO_EP; CK_MB; CK_MB_EIA; CK_MB_EP; CK_MBI_CLC; CK_MBI_EP; CK_MM_EP; CK_MMI; CK_MMI_EP; CK_QN; Troponin; BNP
    - Approximate Reference Range: If the ratio of CK_MB to the total CK is more than 2.5 – 3 (some say more than 5), it is likely

that the source is cardiac (and that the heart was damaged). Ratios between 3 and 5 represent a gray zone. A ratio less than 2.5 – 3 is consistent with a skeletal muscle source.

- Comments: CK_MB to total CK (often multiplied by 100) can assist in differentiating false positive elevations of CK_MB arising from skeletal muscle. No definitive diagnosis can be established without serial determinations to detect a rise.
- Test Method Variance:
- Other:
  - Associated LOINC: 12187-1, 72563-0
  - Associated CPT: 82550, 82553

14. CK_MBI_EP (Creatine Kinase MB/ Creatine Kinase Total Electrophoresis)

    - Common Name: CK_MB/CK (ratio determined by electrophoresis)
    - Long Name: Creatine Kinase MB/ Creatine Kinase Total Electrophoresis
    - Test Type: CK_MBI_EP
    - Panels: N/A
    - Equivalent Tests: Use this TEST_TYPE only when the result is a ratio of CK_MB to CK total determined by electrophoresis.
    - Not Equivalent Tests: All other CK tests.
    - Indications: Blood levels of CK rise when muscle or heart cells are injured. CK_MB levels, along with total CK, are tested in persons who have chest pain to diagnose whether they have had a heart attack. Since a high total CK could indicate damage to either the heart or other muscles, the ratio of CK_MB to total CK helps to distinguish between these two sources.
    - Description: CK_MB is one of three separate forms of CK. CK_MB is found mostly in heart muscle. It rises when there is damage to heart muscle cells. Separation of CK into isoenzymes may be accomplished by electrophoresis, column chromatography, or immunoassay.
    - Related Tests: CK; CK_MB; CK_BB_EP, CK_BBI, CK_BBI_EP; CK_BF, CK_CSF; CK_ISO; CK_ISO_EP; CK_MB; CK_MB_EIA;

CK_MB_EP; CK_MBI_CLC; CK_MBI_EIA; CK_MM_EP; CK_MMI; CK_MMI_EP; CK_QN; Troponin; BNP

- Approximate Reference Range: Normal If the ratio of CK_MB to the total CK is more than 2.5–3 (some say more than 5), it is likely that the source is cardiac (and that the heart was damaged). Ratios between 3 and 5 represent a gray zone. A ratio less than 2.5 – 3 is consistent with a skeletal muscle source.
- Comments: CK_MB to total CK (often multiplied by 100) can assist in differentiating falsepositive elevations of CK_MB arising from skeletal muscle. No definitive diagnosis can be established without serial determinations to detect a rise.
- Test Method Variance:
- Other:
  - Associated LOINC: 12187-1, 72563-0
  - Associated CPT: 82550, 82553

15. CK_MM_EP (Creatine Kinase MM Electrophoresis) ***NEEDS TO BE UPDATED***

16. CK_MMI (Creatine Kinase MM) ***NEEDS TO BE UPDATED***

    - Common Name:
    - Long Name:
    - Test Type:
    - Panels:
    - Equivalent Tests:
    - Not Equivalent Tests:
    - Indications:
    - Description:
    - Related Tests:
    - Approximate Reference Range (varies from lab to lab):
    - Comments:
    - Test Method Variance:
    - Other:
      - Associated LOINC:

  - Associated CPT:

17. CK_MMI_EP (Creatine Kinase MM Electrophoresis) ***NEEDS TO BE UPDATED***

    - Common Name:
    - Long Name:
    - Test Type:
    - Panels:
    - Equivalent Tests:
    - Not Equivalent Tests:
    - Indications:
    - Description:
    - Related Tests:
    - Approximate Reference Range (varies from lab to lab):
    - Comments:
    - Test Method Variance:
    - Other:
      - Associated LOINC:
      - Associated CPT:

18. CK_QN (Creatinine Kinase Macromolecular Quantitative) ***NEEDS TO BE UPDATED***

    - Common Name: Serum creatinine
    - Long Name: Blood/Serum/Plasma Creatinine
    - Test Type: CREATININE
    - Panels: Basic metabolic panel, comprehensive metabolic profile
    - Equivalent Tests: Plasma creatinine, whole blood creatinine
    - Not Equivalent Tests: 24 hour creatinine; creatinine clearance; microalbumin/creatinine ratio;

    creatine. Body fluids other than blood are commonly tested i.e., urine creatinine, peritoneal dialysis fluid, amniotic fluid.

    - Indications: Estimate kidney function

- Description: Urinary excretion of creatinine is relatively constant from day to day. Creatinine

measurement can also be used to provide an internal reference for comparing other tests that are reported with creatinine, for example, the microalbumin/creatinine ratio. Creatinine tests that are reported per creatinine unit such as 24 hour urine creatinine tests relate serum values to urine values. Kidney function is approximately the inverse of the creatinine value, i.e., creatinine of 2.0 ~ 1/2 of normal kidney function.

- Related Tests: Calculated glomerular filtration rate, creatinine clearance
- Approximate Reference Range (Each site will have slight variations): Approximately 0.5-

1.5 mg/dL. Reference range for females is usually slightly lower than reference range for males.

- Comments: Some cephalosporins will react with Jaffre reagent causing falsely elevated

creatinine

- Test Method Variance: Not common
- Other:
  - Associated LOINC:
  - Associated CPT:

1.1.17 (CO2) Carbon Dioxide Test Types

1. CO2_A (Carbon dioxide, total [Moles/volume] in Arterial blood) ***NEEDS TO BE UPDATED***
2. CO2_C (Carbon dioxide, total [Moles/volume] in Arterial blood) ***NEEDS TO BE UPDATED***
3. CO2_V (Carbon dioxide, total [Moles/volume] in Arterial blood) ***NEEDS TO BE UPDATED***
4. CO2_NS (Carbon dioxide, total [Moles/volume] in Arterial blood) ***NEEDS TO BE UPDATED***

5. CO2_A_CLC (Carbon dioxide, total [Moles/volume] in Arterial blood) ***NEEDS TO BE UPDATED***
6. CO2_C_CLC (Carbon dioxide, total [Moles/volume] in Arterial blood) ***NEEDS TO BE UPDATED***
7. CO2_V_CLC (Carbon dioxide, total [Moles/volume] in Arterial blood) ***NEEDS TO BE UPDATED***
8. CO2_NS_CLC (Carbon dioxide, total [Moles/volume] in Arterial blood) ***NEEDS TO BE UPDATED***

1.1.18 COLOGUARD (Noninvasive colorectal cancer screen)

NEEDS TO BE UPDATED

1.1.19 CREATININE (Creatinine Blood/Serum/Plasma)

- Common Name: Serum creatinine
- Long Name: Blood/Serum/Plasma Creatinine
- Test Type: CREATININE
- Panels: Basic metabolic panel, comprehensive metabolic profile
- Equivalent Tests: Plasma creatinine, whole blood creatinine
- Not Equivalent Tests: 24 hour creatinine; creatinine clearance; microalbumin/creatinine ratio; creatine. Body fluids other than blood are commonly tested i.e., urine creatinine, peritoneal dialysis fluid, amniotic fluid.
- Indications: Estimate kidney function
- Description: Urinary excretion of creatinine is relatively constant from day to day. Creatinine measurement can also be used to provide an internal reference for comparing other tests that are reported with creatinine, for example, the microalbumin/creatinine ratio. Creatinine tests that are reported per creatinine unit such as 24 hour urine creatinine tests relate serum values to urine values. Kidney function is approximately the inverse of the creatinine value, i.e., creatinine of 2.0 ~ 1/2 of normal kidney function.

- Related Tests: Calculated glomerular filtration rate, creatinine clearance
- Approximate Reference Range (Each site will have slight variations): Approximately 0.5- 1.5 mg/dL. Reference range for females is usually slightly lower than reference range for males.
- Comments: Some cephalosporins will react with Jaffre reagent causing falsely elevated creatinine
- Test Method Variance: Not common
- Other:
  - Associated LOINC: 101475-2, 11041-1 (postdialysis), 11042-9 (predialysis), 14682-9, 21232-4, 2160-0, 35203-9, 38483-4, 40248-7 (baseline), 40264-4 (baseline), 44784-7, 51619-5 (predialysis), 51620-3 (postdialysis), 59826-8, 77140-2, 96590-5
  - Associated CPT: 82565, 82575

1.1.20 CRP (C-reactive protein)

- Common Name: CRP
- Long Name: C-Reactive Protein
- Test Type: CRP
- Panels: N/A
- Equivalent Tests: N/A
- Not Equivalent Tests: High-sensitivity C-reactive protein (hs-CRP); Erythrocyte sedimentation rate (ESR)
- Indications: To identify the presence of inflammation and to monitor response to treatment for patients with inflammatory disorder (arthritis; rheumatoid arthritis, lupus and other autoimmune disorders; inflammatory bowel disease) or to monitor for infection (after surgery, organ transplants, or burns).
- Description: C-reactive protein (CRP) is an acute phase reactant, a substance made by the liver and secreted into the bloodstream within a few hours after the start of an infection or inflammation. Increased

levels are observed after a heart attack, in sepsis, and after a surgical procedure. Its rise in the blood can also precede pain, fever, or other clinical indicators. The level of CRP can jump a thousandfold in response to inflammation and can be valuable in monitoring disease activity. High normal levels of CRP in otherwise healthy individuals have been found to be predictive of the future risk of a heart attack, stroke, sudden cardiac death, and peripheral arterial disease, even when cholesterol levels are within an acceptable range.

- Related Tests: High-sensitivity C-reactive protein (hs-CRP); Erythrocyte sedimentation rate (ESR)
- Approximate Reference Range (Each site will have slight variations): 0 – 5 mg/L (0.0 – 0.5 mg/dL).
- Comments: CRP levels $<$ 1 mg/L are considered low relative cardiovascular risk; CRP levels 1-3 mg/L are considered average relative cardiovascular risk; CRP levels 3.1 – 10 are considered high relative cardiovascular risk; CRP levels persistently $>$ 10 mg/L may represent non-cardiovascular inflammation. NSAIDs, aspirin or statins may reduce CRP levels in blood. Recent illness, tissue injury, infection, or other acute or chronic inflammation will raise the amount of CRP. CRP levels can be elevated in the later stages of pregnancy as well as with use of birth control pills or hormone replacement therapy. Higher levels of CRP have also been observed in obese individuals.
- Test Method Variance:
- Other:
  - Associated LOINC: 11039-5, 1988-5, 48421-2, 76485-2
  - Associated CPT: 86140

1.1.21 CRP_TIT (C-reactive protein titer)

NEEDS TO BE UPDATED

- Common Name: CRP
- Long Name: C-Reactive Protein
- Test Type: CRP

- Panels: N/A
- Equivalent Tests: N/A
- Not Equivalent Tests: High-sensitivity C-reactive protein (hs-CRP); Erythrocyte sedimentation rate (ESR)
- Indications: To identify the presence of inflammation and to monitor response to treatment for patients with inflammatory disorder (arthritis; rheumatoid arthritis, lupus and other autoimmune disorders; inflammatory bowel disease) or to monitor for infection (after surgery, organ transplants, or burns).
- Description: C-reactive protein (CRP) is an acute phase reactant, a substance made by the liver and secreted into the bloodstream within a few hours after the start of an infection or inflammation. Increased levels are observed after a heart attack, in sepsis, and after a surgical procedure. Its rise in the blood can also precede pain, fever, or other clinical indicators. The level of CRP can jump a thousandfold in response to inflammation and can be valuable in monitoring disease activity. High normal levels of CRP in otherwise healthy individuals have been found to be predictive of the future risk of a heart attack, stroke, sudden cardiac death, and peripheral arterial disease, even when cholesterol levels are within an acceptable range.
- Related Tests: High-sensitivity C-reactive protein (hs-CRP); Erythrocyte sedimentation rate (ESR)
- Approximate Reference Range (Each site will have slight variations): 0 – 5 mg/L (0.0 – 0.5 mg/dL).
- Comments: CRP levels $<$ 1 mg/L are considered low relative cardiovascular risk; CRP levels 1

– 3 mg/L are considered average relative cardiovascular risk; CRP levels 3.1 – 10 are considered high relative cardiovascular risk; CRP levels persistently $>$ 10 mg/L may represent non-cardiovascular inflammation. NSAIDs, aspirin or statins may reduce CRP levels in blood. Recent illness, tissue injury, infection, or other acute or chronic inflammation will raise the amount of CRP. CRP levels can be elevated in the later stages of pregnancy as well as with use of birth control pills or hormone replacement therapy. Higher levels of CRP have also been observed in obese individuals.

- Test Method Variance:
- Other:
  - Associated LOINC:
  - Associated CPT:

1.1.22 CRPHS (High-sensitivity C-reactive protein in serum/plasma)

- Common Name: hsCRP
- Long Name: High-sensitivity C-Reactive Protein
- Test Type: CRPHS
- Panels: N/A
- Equivalent Tests: N/A
- Not Equivalent Tests: C-reactive protein (CRP); Erythrocyte sedimentation rate (ESR)
- Indications: To assess risk of developing heart disease, cardiovascular disease (CVD), or other processes involving inflammation. Inflammation plays a major role in atherosclerosis, which is often associated with CVD. Studies have shown that measuring CRP with the improved methodology of the highly sensitive assay can identify the risk level for CVD in apparently healthy people; the hs-CRP test may be used to screen healthy people.
- Description: CRP is made by the liver and secreted into the bloodstream. It can be measured with two different tests: CRP and hs-CRP, each measuring different blood ranges. The hs-CRP test can more accurately detect lower concentrations of the protein that may be within the normal range than the standard CRP test. Individuals with hs-CRP results in the high end of the normal range have 1.5 to 4 times the risk of having a heart attack as those with hs-CRP values at the low end of the normal range.
- Related Tests: Lipid profile, Cardiac risk assessment, CRP, Erythrocyte sedimentation rate (ESR)
- Approximate Reference Range: 0 – 5 mg/L (0.0 – 0.5 mg/dL).

- Comments: Hs-CRP usually is ordered as one of several tests in a cardiovascular risk profile, often along with tests for cholesterol and triglycerides. The American Heart Association and US Centers for Disease Control and Prevention have defined risk groups as follows: Low risk ($<$ 1.0 mg/L); Average risk (1.0 to 3.0 mg/L); High risk $>$ 3.0 mg/L) NSAIDs, aspirin or statins may reduce CRP levels in blood. Recent illness, tissue injury, infection, or other acute or chronic inflammation will raise the amount of CRP. CRP levels can be elevated in the later stages of pregnancy as well as with use of birth control pills or hormone replacement therapy. Higher levels of CRP have also been observed in the obese.
- Test Method Variance:
- Other:
  - Associated LOINC: 30522-7, 71426-1, 76486-0
  - Associated CPT: 86141

1.1.23 CRPHS_QUIN (High-sensitivity C-reactive protein quintile)

NEEDS TO BE UPDATED

- Common Name: hsCRP
- Long Name: High-sensitivity C-Reactive Protein
- Test Type: CRPHS
- Panels: N/A
- Equivalent Tests: N/A
- Not Equivalent Tests: C-reactive protein (CRP); Erythrocyte sedimentation rate (ESR)
- Indications: To assess risk of developing heart disease, cardiovascular disease (CVD), or other processes involving inflammation. Inflammation plays a major role in atherosclerosis, which is often associated with CVD. Studies have shown that measuring CRP with the improved methodology of the highly sensitive assay can identify the risk level for CVD in apparently healthy people; the hs-CRP test may be used to screen healthy people.

- Description: CRP is made by the liver and secreted into the bloodstream. It can be measured with two different tests: CRP and hs-CRP, each measuring different blood ranges. The hs-CRP test can more accurately detect lower concentrations of the protein that may be within the normal range than the standard CRP test. Individuals with hs-CRP results in the high end of the normal range have 1.5 to 4 times the risk of having a heart attack as those with hs-CRP values at the low end of the normal range.
- Related Tests: Lipid profile, Cardiac risk assessment, CRP, Erythrocyte sedimentation rate (ESR)
- Approximate Reference Range: 0 – 5 mg/L (0.0 – 0.5 mg/dL).
- Comments: Hs-CRP usually is ordered as one of several tests in a cardiovascular risk profile, often along with tests for cholesterol and triglycerides. The American Heart Association and US Centers for Disease Control and Prevention have defined risk groups as follows: Low risk ($<$ 1.0 mg/L); Average risk (1.0 to 3.0 mg/L); High risk $>$ 3.0 mg/L) NSAIDs, aspirin or statins may reduce CRP levels in blood. Recent illness, tissue injury, infection, or other acute or chronic inflammation will raise the amount of CRP. CRP levels can be elevated in the later stages of pregnancy as well as with use of birth control pills or hormone replacement therapy. Higher levels of CRP have also been observed in the obese.
- Test Method Variance:
- Other:
  - Associated LOINC:
  - Associated CPT:

1.1.24 CYSTATIN_C (Cystatin C [Mass/volume])

NEEDS TO BE UPDATED

1.1.25 (D-DIME) D-dimer fibrin derivatives Test Types

1. D-DIME_DDU (D-dimer fibrin derivatives, quantitative, D-Dimer Units)
   NEEDS TO BE UPDATED
   - Common Name: Fragment D-dimer; fibrin degradation fragment

- Long Name: D-dimer fibrin derivatives;
- Test Type: D-dimer
- Panels: None
- Equivalent Tests: None Related
- Not Equivalent, Tests: Fibrin Degradation Products (FDP); Fibrin Split Products (FSP); Prothrombin Time (PT); Partial Thromboplastin Time (PTT); Fibrinogen; Platelet Count
- Indications: D-dimer tests are ordered to help rule out the presence of a clot (thrombus). Some of the conditions that the d-dimer test is used to help rule out include deep vein thrombosis (DVT), pulmonary embolism (PE), strokes. The D-dimer test may be used to determine if further testing is necessary to help diagnose diseases and conditions that cause inappropriate clotting. A D-dimer level may be used to help diagnose disseminated intravascular coagulation (DIC) and to monitor the effectiveness of DIC treatment.
- Description: D-dimer is one of the protein fragments produced when a blood clot dissolves in the body. It is a specific plasmin-mediated breakdown product of crosslinked fibrin. When a blood vessel or tissue is injured and bleeds, the body creates a blood clot to stop the bleeding. During this process, threads of a protein called fibrin are produced. These threads crosslink together to form a fibrin net, which, together with platelets, helps hold the forming blood clot in place at the site of the injury until it heals. Once the clot is no longer needed, the body uses an enzyme called plasmin to break up the clot. The fragments of the disintegrating fibrin in the clot are called fibrin degradation products (FDP). One of the fibrin degradation products produced is D-dimer. D-dimer is normally undetectable. It is produced only after a clot has formed and is in the process of being broken down. When there is significant formation and breakdown of blood clots in the body, the D-dimer blood level rises. A positive d-dimer test cannot predict whether or not a clot is present, but rather indicates that further testing is required. A negative D- dimer test means that it is unlikely that a clot is present. A normal D-dimer result has a negative predictive value of approximately 95% for the exclusion of acute PE or DVT when there is low or moderate pretest PE probability.

- Approximate Reference Range: A normal qualitative D-dimer result is "undetectable: or "negative" or "not detected." Quantitative results of < = 250 ng/mL D-Dimer Units (DDU) OR < = 0.5 mcg/mL Fibrinogen Equivalent Units (FEU) are normal. The normal reportable range is sometimes listed as 110 - 250 ng/mL DDU OR 0.22 - 0.50 mcg/mL FEU. Results can be reported in as many as eight different combinations of types (e.g., FEU, DDU) and magnitude (e.g., ng/mL, mcg/L [g/L], mcg/ml [g/mL], mg/L) of units. Unfortunately, at times result units are only reported as the magnitude (whether FEU or DDU type is not reported). In these cases, ranges and abnormal flags can assist in guiding the interpretation, but it is not always possible to assign magnitude. Do not make assumptions if you cannot determine the magnitude of the results.
- Comments: A normal or negative D-dimer result means that it is most likely that the person tested does not have an acute condition or disease that is causing abnormal clot formation and breakdown. The test is used to help rule out clotting as the cause of symptoms. A positive Ddimer result may indicate the presence of an abnormally high level of fibrin degradation products. It tells the doctor that there may be significant blood clot formation and breakdown in the body, but it does not tell the location or cause. An elevated D-dimer does not always indicate the presence of a clot because a number of other factors can cause an increased level (e.g., recent surgery, pregnancy, trauma, infection, heart disease, some cancers). D-dimer is not used as the only test to diagnose a condition.
- Test Method Variance: There are several different methods of testing for D-dimer. Most of the D-dimer tests that yield quantitative results are done in a hospital lab, while those that yield qualitative or semi-quantitative results are performed at the patient's bedside (point of care).
- Other:
  - Associated LOINC:
  - Associated CPT:

2. D-DIME_FEU (D-dimer fibrin derivatives, quantitative, Fibinogen Equivalent Units) ***NEEDS TO BE UPDATED***

   - Common Name: Fragment D-dimer; fibrin degradation fragment

- Long Name: D-dimer fibrin derivatives;
- Test Type: D-dimer
- Panels: None

Equivalent Tests: None Related, but Not Equivalent, Tests: Fibrin Degradation Products (FDP); Fibrin Split Products (FSP); Prothrombin Time (PT); Partial Thromboplastin Time (PTT); Fibrinogen; Platelet Count

- Indications: D-dimer tests are ordered to help rule out the presence of a clot (thrombus). Some of the conditions that the d-dimer test is used to help rule out include deep vein thrombosis (DVT), pulmonary embolism (PE), strokes. The D-dimer test may be used to determine if further testing is necessary to help diagnose diseases and conditions that cause inappropriate clotting. A D-dimer level may be used to help diagnose disseminated intravascular coagulation (DIC) and to monitor the effectiveness of DIC treatment.
- Description: D-dimer is one of the protein fragments produced when a blood clot dissolves in the body. It is a specific plasmin-mediated breakdown product of crosslinked fibrin. When a blood vessel or tissue is injured and bleeds, the body creates a blood clot to stop the bleeding. During this process, threads of a protein called fibrin are produced. These threads crosslink together to form a fibrin net, which, together with platelets, helps hold the forming blood clot in place at the site of the injury until it heals. Once the clot is no longer needed, the body uses an enzyme called plasmin to break up the clot. The fragments of the disintegrating fibrin in the clot are called fibrin degradation products (FDP). One of the fibrin degradation products produced is D-dimer. D-dimer is normally undetectable. It is produced only after a clot has formed and is in the process of being broken down. When there is significant formation and breakdown of blood clots in the body, the D-dimer blood level rises. A positive d-dimer test cannot predict whether or not a clot is present, but rather indicates that further testing is required. A negative D- dimer test means that it is unlikely that a clot is present. A normal D-dimer result has a negative predictive value of approximately 95% for the exclusion of acute PE or DVT when there is low or moderate pretest PE probability.

- Approximate Reference Range: A normal qualitative D-dimer result is "undetectable: or "negative" or "not detected." Quantitative results of < = 250 ng/mL D-Dimer Units (DDU) OR < = 0.5 mcg/mL Fibrinogen Equivalent Units (FEU) are normal. The normal reportable range is sometimes listed as 110 - 250 ng/mL DDU OR 0.22 - 0.50 mcg/mL FEU. Results can be reported in as many as eight different combinations of types (e.g., FEU, DDU) and magnitude (e.g., ng/mL, mcg/L [g/L], mcg/ml [g/mL], mg/L) of units. Unfortunately, at times result units are only reported as the magnitude (whether FEU or DDU type is not reported). In these cases, ranges and abnormal flags can assist in guiding the interpretation, but it is not always possible to assign magnitude. Do not make assumptions if you cannot determine the magnitude of the results.
- Comments: A normal or negative D-dimer result means that it is most likely that the person tested does not have an acute condition or disease that is causing abnormal clot formation and breakdown. The test is used to help rule out clotting as the cause of symptoms. A positive Ddimer result may indicate the presence of an abnormally high level of fibrin degradation products. It tells the doctor that there may be significant blood clot formation and breakdown in the body, but it does not tell the location or cause. An elevated D-dimer does not always indicate the presence of a clot because a number of other factors can cause an increased level (e.g., recent surgery, pregnancy, trauma, infection, heart disease, some cancers). D-dimer is not used as the only test to diagnose a condition.
- Test Method Variance: There are several different methods of testing for D-dimer. Most of the D-dimer tests that yield quantitative results are done in a hospital lab, while those that yield qualitative or semi-quantitative results are performed at the patient's bedside (point of care).
- Other:
  - Associated LOINC:
  - Associated CPT:

3. D-DIME_NS (D-dimer fibrin derivatives, quantitative, Not Specified) ***NEEDS TO BE UPDATED***
   - Common Name: Fragment D-dimer; fibrin degradation fragment

- Long Name: D-dimer fibrin derivatives;
- Test Type: D-dimer
- Panels: None
- Equivalent Tests: None Related, but Not Equivalent, Tests: Fibrin Degradation Products (FDP); Fibrin Split Products (FSP); Prothrombin Time (PT); Partial Thromboplastin Time (PTT); Fibrinogen; Platelet Count
- Indications: D-dimer tests are ordered to help rule out the presence of a clot (thrombus). Some of the conditions that the d-dimer test is used to help rule out include deep vein thrombosis (DVT), pulmonary embolism (PE), strokes. The D-dimer test may be used to determine if further testing is necessary to help diagnose diseases and conditions that cause inappropriate clotting. A D-dimer level may be used to help diagnose disseminated intravascular coagulation (DIC) and to monitor the effectiveness of DIC treatment.
- Description: D-dimer is one of the protein fragments produced when a blood clot dissolves in the body. It is a specific plasmin-mediated breakdown product of crosslinked fibrin. When a blood vessel or tissue is injured and bleeds, the body creates a blood clot to stop the bleeding. During this process, threads of a protein called fibrin are produced. These threads crosslink together to form a fibrin net, which, together with platelets, helps hold the forming blood clot in place at the site of the injury until it heals. Once the clot is no longer needed, the body uses an enzyme called plasmin to break up the clot. The fragments of the disintegrating fibrin in the clot are called fibrin degradation products (FDP). One of the fibrin degradation products produced is D-dimer. D-dimer is normally undetectable. It is produced only after a clot has formed and is in the process of being broken down. When there is significant formation and breakdown of blood clots in the body, the D-dimer blood level rises. A positive d-dimer test cannot predict whether or not a clot is present, but rather indicates that further testing is required. A negative D- dimer test means that it is unlikely that a clot is present. A normal D-dimer result has a negative predictive value of approximately 95% for the exclusion of acute PE or DVT when there is low or moderate pretest PE probability.

- Approximate Reference Range: A normal qualitative D-dimer result is "undetectable: or "negative" or "not detected." Quantitative results of < = 250 ng/mL D-Dimer Units (DDU) OR < = 0.5 mcg/mL Fibrinogen Equivalent Units (FEU) are normal. The normal reportable range is sometimes listed as 110 - 250 ng/mL DDU OR 0.22 - 0.50 mcg/mL FEU. Results can be reported in as many as eight different combinations of types (e.g., FEU, DDU) and magnitude (e.g., ng/mL, mcg/L [g/L], mcg/ml [g/mL], mg/L) of units. Unfortunately, at times result units are only reported as the magnitude (whether FEU or DDU type is not reported). In these cases, ranges and abnormal flags can assist in guiding the interpretation, but it is not always possible to assign magnitude. Do not make assumptions if you cannot determine the magnitude of the results.
- Comments: A normal or negative D-dimer result means that it is most likely that the person tested does not have an acute condition or disease that is causing abnormal clot formation and breakdown. The test is used to help rule out clotting as the cause of symptoms. A positive Ddimer result may indicate the presence of an abnormally high level of fibrin degradation products. It tells the doctor that there may be significant blood clot formation and breakdown in the body, but it does not tell the location or cause. An elevated D-dimer does not always indicate the presence of a clot because a number of other factors can cause an increased level (e.g., recent surgery, pregnancy, trauma, infection, heart disease, some cancers). D-dimer is not used as the only test to diagnose a condition.
- Test Method Variance: There are several different methods of testing for D-dimer. Most of the D-dimer tests that yield quantitative results are done in a hospital lab, while those that yield qualitative or semi-quantitative results are performed at the patient's bedside (point of care).
- Other:
  - Associated LOINC:
  - Associated CPT:

4. D-DIMER_QL (D-dimer fibrin derivatives, qualitative) ***NEEDS TO BE UPDATED***

   - Common Name: Fragment D-dimer; fibrin degradation fragment

- Long Name: D-dimer fibrin derivatives;
- Test Type: D-dimer
- Panels: None
- Equivalent Tests: None

Related, but Not Equivalent, Tests: Fibrin Degradation Products (FDP); Fibrin Split Products (FSP); Prothrombin Time (PT); Partial Thromboplastin Time (PTT); Fibrinogen; Platelet Count

- Indications: D-dimer tests are ordered to help rule out the presence of a clot (thrombus). Some of the conditions that the d-dimer test is used to help rule out include deep vein thrombosis

(DVT), pulmonary embolism (PE), strokes. The D-dimer test may be used to determine if further testing is necessary to help diagnose diseases and conditions that cause inappropriate clotting. A D-dimer level may be used to help diagnose disseminated intravascular coagulation (DIC) and to monitor the effectiveness of DIC treatment.

- Description: D-dimer is one of the protein fragments produced when a blood clot dissolves in the body. It is a specific plasmin-mediated breakdown product of crosslinked fibrin. When a blood vessel or tissue is injured and bleeds, the body creates a blood clot to stop the bleeding. During this process, threads of a protein called fibrin are produced. These threads crosslink together to form a fibrin net, which, together with platelets, helps hold the forming blood clot in place at the site of the injury until it heals. Once the clot is no longer needed, the body uses an enzyme called plasmin to break up the clot. The fragments of the disintegrating fibrin in the clot are called fibrin degradation products (FDP). One of the fibrin degradation products produced is D-dimer. D-dimer is normally undetectable. It is produced only after a clot has formed and is in the process of being broken down. When there is significant formation and breakdown of blood clots in the body, the D-dimer blood level rises. A positive d-dimer test cannot predict whether or not a clot is present, but rather indicates that further testing is required. A negative D- dimer test means that it is unlikely that a clot is present. A normal D-dimer result has a negative predictive value of approximately 95% for the exclusion of acute PE or DVT when there is low or moderate pretest PE probability.

- Approximate Reference Range: A normal qualitative D-dimer result is "undetectable: or "negative" or "not detected." Quantitative results of < = 250 ng/mL D-Dimer Units (DDU) OR < = 0.5 mcg/mL Fibrinogen Equivalent Units (FEU) are normal. The normal reportable range is sometimes listed as 110 - 250 ng/mL DDU OR 0.22 - 0.50 mcg/mL FEU. Results can be reported in as many as eight different combinations of types (e.g., FEU, DDU) and magnitude (e.g., ng/mL, mcg/L [g/L], mcg/ml [g/mL], mg/L) of units. Unfortunately, at times result units are only reported as the magnitude (whether FEU or DDU type is not reported). In these cases, ranges and abnormal flags can assist in guiding the interpretation, but it is not always possible to assign magnitude. Do not make assumptions if you cannot determine the magnitude of the results.
- Comments: A normal or negative D-dimer result means that it is most likely that the person tested does not have an acute condition or disease that is causing abnormal clot formation and breakdown. The test is used to help rule out clotting as the cause of symptoms. A positive Ddimer result may indicate the presence of an abnormally high level of fibrin degradation products. It tells the doctor that there may be significant blood clot formation and breakdown in the body, but it does not tell the location or cause. An elevated D-dimer does not always indicate the presence of a clot because a number of other factors can cause an increased level (e.g., recent surgery, pregnancy, trauma, infection, heart disease, some cancers). D-dimer is not used as the only test to diagnose a condition.
- Test Method Variance: There are several different methods of testing for D-dimer. Most of the D-dimer tests that yield quantitative results are done in a hospital lab, while those that yield qualitative or semi-quantitative results are performed at the patient's bedside (point of care).
- Other:
  - Associated LOINC:
  - Associated CPT:

1.1.26 ESR (Erythrocyte sedimentation rate)

NEEDS TO BE UPDATED

1.1.27 (FE) Iron Test Types

1. FE (Iron in Serum or Plasma) ***NEEDS TO BE UPDATED***
2. FE_QL (Iron in Serum or Plasma qualitative) ***NEEDS TO BE UPDATED***
3. FE_SATURATION (Iron Saturation in Serum or Plasma) ***NEEDS TO BE UPDATED***
4. FE_TIBC (Iron Binding Capacity in Serum or Plasma) ***NEEDS TO BE UPDATED***
5. FE_UIBC (Iron Binding Capacity in Serum or Plasma unsaturted) ***NEEDS TO BE UPDATED***
6. FE_TRANSFERRIN_RATIO (Iron/Transerrin ration in Serum or Plasma) ***NEEDS TO BE UPDATED***

1.1.28 (FOB) Fecal Occult Blood Test Types

1. FOB_GUAI (Fecal Occult Blood Test qualitative, guaiac)
    - Common Name: FOBT; fecal occult blood test
    - Long Name: FOBT qualitative; fecal occult blood; occult blood in stool; guaiac
    - Test Type: FOB_GUAI (NOTE: This is likely to be the FOBT TEST_TYPE where the majority of your site's FOBT tests will be mapped as this is the "Home FOBT" [see below]).
    - Panels:
    - Equivalent tests: FOBT is a general name applied to stool tests that detect blood "hidden" (occult) in the stool. Two basic technologies are employed: the older guaiac tests and the newer immunochemical tests (see test type FOB_IMMUN). These two tests are sometimes distinguished as "guaiac test" or gFOBT versus fecal immunochemical test (FIT), or iFOBT. The information on this sheet applies to the guaiac test (gFOBT) which can also be listed as Hemoccult®️ or similar (e.g., Hemoccult II®️, Hemoccult II ®️ SENSA®️, Hemoccult II ®️ SENSA®️elite, ColoScreen®️, Colocare®️, EZ Detect®️, Seracult®️, Sure Vue®️). Please refer to other sections of this Reference for information about other stool blood tests.

- Not equivalent tests: The test must be from stool (feces). Text searches for "hemoccult" may or may not be productive. Text searches on feces, "fecal", or "occult blood" may be useful, but many of these tests are unrelated to FOBT. Do not confuse FOBT with other tests related to blood. Be cautious when considering tests that contain the word "heme" because, although FOBT recognizes the "heme" portion of hemoglobin, hemoglobin is the oxygen-carrying molecule in blood and many tests containing the root "heme" are not FOBT. There were formerly two applications of the FOBT test. "Office FOBT" is no longer recommended. In that procedure, the provider collected a smear of fecal sample coincident with a digital rectal exam, and applied it to a single test card. "Home FOBT" is the recommended procedure, in which the provider gives the patient a test kit to complete at home (the kit often contains 3 cards, allowing for collection of 2 samples per day for 3 days). This TEST_TYPE is for the home FOBT.
- Indications: The FOBT detects blood in stool. The test can be used to screen for colorectal cancer (CRC), or to diagnose other conditions that cause bleeding into the gastrointestinal (GI) tract. Occult (not visible to the eye).blood in feces may be due to CRC, polyps, or other GI conditions (e.g., hemorrhoids, anal fissures, ulcers, inflammatory bowel disease).
- Description: The guaiac is qualitative, i.e., any color change indicates a positive test. A typical guaiac test card contains 3 or 6 "windows." The patient takes the test card home and collects fecal samples over 3 days. The patient applies a thin smear of feces to Window A of the card, and then applies a second smear from a different part of the stool to Window B, etc. A complete test consists of a card containing 6 smears. The patient returns the sample to a laboratory or medical office for development. The test is read by adding drops of developer to the guaiac paper and noting the color change (any trace of blue on any smear is a positive test). The test is qualitative in that the result is negative, positive or not interpetable. At some sites, the results may be reported individually for each of the boxes (i.e., specimens). If all specimens are reported as negative the test result is negative. If even one specimen is reported as positive the test result is positive. Any color change for any of the specimens constitutes a positive test. The following LOINC codes correspond to the indi-

vidual specimens when results are reported individually for each box:

  - 2nd specimen 14564-9
  - 3rd specimen 14565-6
  - 4th specimen 12503-9
  - 5th specimen 10504-7
  - 6th specimen 27401-9
  - 7th specimen 27925-7
  - 8th specimen 27926-5

- Related Tests: See the following TEST_TYPES: FOB1_GUAI, FOB_QN, and FOB_IMMUN
- Approximate Reference Range: N/A
- Comments: High does of vitamin C (or other strong anti-oxidant) may inhibit the color reaction and cause a false negative. Consumption of meat has been shown to cause false positives for guaiac testing by providing a source of hemoglobin other than blood.
- Test Method Variance:
- Other
  - Associated LOINC: 2335-8, (14564-9, 14565-6, 12503-9, 10504-7, 12504-7, 27401-9, 27925-7, 27926-5)
  - Associated CPT: 82270, 82272

2. FOB1_GUAI (Fecal Occult Blood Test One Specimen qualitative, guaiac)

   - Common Name: FOBT; fecal occult blood test, first specimen
   - Long Name: FOBT qualitative; fecal occult blood; occult blood in stool; guaiac, single specimen
   - Test Type: FOB1_GUAI (NOTE: This TEST_TYPE is intended to be used ONLY when the Office FOBT is performed [see below]. Some sites will not use this TEST_TYPE at all).
   - Panels:
   - Equivalent tests: FOBT is a general name applied to stool tests that detect blood "hidden" (occult) in the stool. Two basic technologies are employed: the guaiac test (older, routinely used), and newer immunochemical tests (see test type FOB_IMMUN).

These two tests are sometimes distinguished as "guaiac test" or gFOBT, versus fecal immunochemical test (FIT), or iFOBT. This information applies to the older guaiac test (gFOBT).The FOBT test can be listed as Hemoccult® or similar (e.g., Hemoccult II®, Hemoccult II ® SENSA®, Hemoccult II ® SENSA®elite, ColoScreen®, Colocare®, EZ Detect®, Seracult®, Sure Vue®). Please refer to other section of the Reference Document for information about other stool blood tests. Not equivalent tests: The test must be from stool (feces). Text searches for "hemoccult" may or may not be productive. Text searches on "feces", "fecal", or "occult blood" may be useful, but do not over-generalize; many of these tests are unrelated to FOBT. Do not to confuse FOBT with other tests related to blood. Be cautious when considering tests that contain the word "heme" because, although FOBT recognizes the "heme" portion of hemoglobin, hemoglobin is the oxygen-carrying molecule in blood and many tests containing the root "heme" are not FOBT. There were formerly two applications of the FOBT test. "Office FOBT" is no longer recommended. In that procedure, the provider collects a smear of fecal sample coincident with a digital rectal exam, and applies it to a single test card. "Home FOBT" is the recommended procedure, in which the provider gives the patient a test kit to complete at home (the kit often contains 3 cards, allowing for collection of 2 samples per day for 3 days). This TEST_TYPE is for the office FOBT.

- Indications: The fecal occult blood test (FOBT) detects blood in stool. The test may be performed to screen for colorectal cancer (CRC), or to diagnose other conditions that cause bleeding into the gastrointestinal (GI) tract. Occult blood in feces may be due to CRC, polyps, or other GI conditions (e.g., hemorrhoids, anal fissures, ulcers, inflammatory bowel disease).
- Description: The guaiac is qualitative, i.e., any color change indicates a positive test. In the office FOBT, typically the smear is applied to a single card. The test is read by adding drops of developer to the guaiac paper and noting the color change. Any trace of blue on any of the fecal smears is considered a positive test. The test is qualitative in that the result is negative, positive or not interpetable.
- Related Tests: See the following TEST_TYPES: FOB_GUAI, FOB_QN, and FOB_IMMUN

- Approximate Reference Range: N/A
- Comments: High does of vitamin C (or other strong anti-oxidant) may inhibit the color reaction and cause a false negative. Consumption of meat has been shown to cause false positives for guaiac testing by providing a source of hemoglobin other than blood.
- Test Method Variance:
- Other
  - Associated LOINC: 14563-1
  - Associated CPT: 82270, 82273

3. FOB_QN (Fecal Occult Blood Test, Quantitative)

   - Common Name: Quantitative FOBT test
   - Long Name: FOBT quantitative; fecal occult blood; occult blood in stool; guaiac
   - Test Type: FOB_QN (NOTE: We are not aware that any site is using a quantitative FOBT test with the exception of the newer immune test. We anticipate that this TEST_TYPE will rarely be populated in the VDW).
   - Panels:
   - Equivalent tests: FOBT is a general name applied to stool tests that detect blood "hidden" (occult) in the stool. Two basic technologies are employed: the guaiac test (older, routinely used), and newer immunochemical tests (see test type FOB_IMMUN). These two tests are sometimes distinguished as "guaiac test" or gFOBT, versus fecal immunochemical test (FIT), or iFOBT. Please refer to other section of the Reference Document for information about other stool blood tests.
   - Not equivalent tests: The test must be from stool (feces). Text searches for "hemoccult" may or may not be productive. Text searches on "feces", "fecal", or "occult blood" may be useful, but do not over-generalize; many of these tests are unrelated to FOBT. Do not to confuse FOBT with other tests related to blood. Be cautious when considering tests that contain the word "heme" because, although FOBT recognizes the "heme" portion of hemoglobin, hemoglobin is the oxygen-carrying molecule in blood and many tests containing the root "heme" are not FOBT.

- Indications: The fecal occult blood test (FOBT) detects blood in stool. The test may be performed to screen for colorectal cancer (CRC), or to diagnose other conditions that cause bleeding into the gastrointestinal (GI) tract. Occult (blood not visible to the eye) blood in feces may be due to CRC, polyps, or other GI conditions (e.g., hemorrhoids, anal fissures, ulcers, inflammatory bowel disease).
- Description:
- Related Tests: See the following TEST_TYPES: FOB_GUAI, FOB1_GUAI, and FOB_IMMUN
- Approximate Reference Range:
- Comments:
- Test Method Variance:
- Other
  - Associated LOINC: 27396-1
  - Associated CPT: 82270, 82274

4. FOB_IMMUN (Fecal Immunologic [Immunochemical] qualitative)

   - Common Name: FIT (fecal immunochemical test0, iFOBT
   - Long Name: FOBT qualitative; quick test; HFH test; occult blood in stool; immunologic
   - Test Type: FOB_IMMUN
   - Panels:
   - Equivalent tests: FOBT is a general name applied to stool tests to detect blood "hidden" (occult) in the stool. Two basic technologies are employed: the guaiac test, which is older and used routinely, and the immunochemical tests, which are newer. The fecal immunochemical test is the "FIT" or iFOBT. The FIT can also be known as the Hemoccult ICT ® (formerly FlexSure OBT®), Immudia-Hem Sp® , HemSelect®, or Insure®. The information provided here applies to the iFOBT or FIT. Please see the other FOBT sheets for information about other occult blood tests for stool.
   - Not equivalent tests: The FOBT test must be from stool. Text searches for "hemoccult" may or may not be productive. Similarly, text searches on "feces", "fecal", or "occult blood" may be useful

but do not over-generalize; many of these tests will be unrelated to FOBT. Do not to confuse FOBT with other tests related to blood. Be cautious when considering tests that contain the word "heme" because, although FOBT recognizes the "heme" portion of hemoglobin, hemoglobin is the oxygen-carrying molecule in blood and many tests containing the root "heme" are not FOBT.

- Indications: The FIT detects blood in stool. The test may be performed to screen for colorectal cancer (CRC), or to diagnose other conditions that cause bleeding into the gastrointestinal (GI) tract. Occult (blood not visible to the eye) blood in feces may be due to CRC, polyps, or other GI conditions (e.g., hemorrhoids, anal fissures, ulcers, inflammatory bowel disease).
- Description: Fecal immunochemical tests use antibodies to detect human hemoglobin in stool samples. They are specific for human blood (in contrast to the guaiac test which detects nonhuman blood and is influenced by other interferences). The immunochemical test causes a color change; i.e., with a change in color indicating a positive test. In routine clinical use the expected result would be qualitative; the number of windows tested, and the number that are negative/positive. FIT is a newer test than the guaiac. FIT sample collection procedures are designed to increase acceptability and adherence by patients.
- Related Tests: See the following TEST_TYPES: FOB_GUAI, FOB1_GUAI, and FOB_QN
- Approximate Reference Range: N/A
- Comments: Remember that this is a stool test; the material being tested is human feces. When conducting string searches of databases to locate iFOBT tests, it may be useful to use terms such as "fecal", "stool" and "occult", and to ascertain that stool is the medium being tested.
- Test Method Variance:
- Other
  - Associated LOINC: 29771-3, 56490-6, 56491-4, 57905-2
  - Associated CPT: 82274

5. FOB_IMMUN_QN (Fecal Immunologic [Immunochemical] quantitative) ***NEEDS TO BE UPDATED***

   - Common Name: FIT (fecal immunochemical test0, iFOBT

- Long Name: FOBT qualitative; quick test; HFH test; occult blood in stool; immunologic
- Test Type: FOB_IMMUN
- Panels:

Equivalent tests: FOBT is a general name applied to stool tests to detect blood "hidden" (occult) in the stool. Two basic technologies are employed: the guaiac test, which is older and used routinely, and the immunochemical tests, which are newer. The fecal immunochemical test is the "FIT" or iFOBT. The FIT can also be known as the Hemoccult ICT ® (formerly FlexSure OBT®), Immudia-Hem Sp® , HemSelect®, or Insure®. The information provided here applies to the iFOBT or FIT. Please see the other FOBT sheets for information about other occult blood tests for stool. Not equivalent tests: The FOBT test must be from stool. Text searches for "hemoccult" may or may not be productive. Similarly, text searches on "feces", "fecal", or "occult blood" may be useful but do not over-generalize; many of these tests will be unrelated to FOBT. Do not to confuse FOBT with other tests related to blood. Be cautious when considering tests that contain the word "heme" because, although FOBT recognizes the "heme" portion of hemoglobin, hemoglobin is the oxygen-carrying molecule in blood and many tests containing the root "heme" are not FOBT.

- Indications: The FIT detects blood in stool. The test may be performed to screen for colorectal cancer (CRC), or to diagnose other conditions that cause bleeding into the gastrointestinal (GI) tract. Occult (blood not visible to the eye) blood in feces may be due to CRC, polyps, or other GI conditions (e.g., hemorrhoids, anal fissures, ulcers, inflammatory bowel disease).
- Description: Fecal immunochemical tests use antibodies to detect human hemoglobin in stool samples. They are specific for human blood (in contrast to the guaiac test which detects nonhuman blood and is influenced by other interferences). The immunochemical test causes a color change; i.e., with a change in color indicating a positive test. In routine clinical use the expected result would be qualitative; the number of windows tested, and the number that are negative/positive. FIT is a newer test than the guaiac. FIT sample collection procedures are designed to increase acceptability and adherence by patients.

- Related Tests: See the following TEST_TYPES: FOB_GUAI, FOB1_GUAI, and FOB_QN
- Approximate Reference Range: N/A
- Comments: Remember that this is a stool test; the material being tested is human feces. When conducting string searches of databases to locate iFOBT tests, it may be useful to use terms such as "fecal", "stool" and "occult", and to ascertain that stool is the medium being tested.
- Test Method Variance:

1.1.29 FOLATE (Folate in serum)

- Common Name Folate
- Long Name: Folate
- Test Type: FOLATE
- Panels:
- Equivalent Tests: Folic Acid in serum
- Not Equivalent Tests: RBC folate
- Indications: To help diagnose the cause of anemia or neuropathy (nerve damage); to evaluate nutritional status in some patients; to monitor effectiveness of treatment for B12 or folate deficiency
- Description: Fasting for 6-8 hours before sample collection may be required.
- Related Tests: B12; CBC; CMP; Methylmalonic acid (MMA); Homocysteine
- Approximate Reference Range (Each site will have slight variations: Lower limit of normal: Approximately 1.5 - 3 ng/mL (or mcg/L). Upper limit of normal approximately 17 – 100 ng/mL. (Note: If RBC folate is inadvertently included, the reference range is one useful way to check to see if incorrect folate tests have been pulled. The lower limit of the normal range of RBC folate levels is approximately 100 – 180 and the upper limit of the normal range is RBC folate is approximately 360 – 800.)

- Comments: B12 and folate are primarily ordered to help diagnose the cause of macrocytic anemia. They are ordered as follow-up tests when large RBCs and a decreased hemoglobin concentration are found during a CBC test. B12 may be ordered with folate, by itself, or with other screening laboratory tests to help diagnose the cause of neuropathy. Either a serum or RBC folate test may be used to help detect a deficiency. Some doctors feel that the RBC folate test is more clinically relevant than serum folate, but there is not widespread agreement on this. High levels of B12 and folate are not usually clinically monitored. Increased folate may be seen with pernicious anemia and with vegetarian diets.
- Test Method Variance:
- Other:
  - Associated LOINC: 35210-4, 2284-8, 14732-2, 2282-2, 25415-1
  - Associated CPT: 82746

1.1.30 FOLATE_RBC (Folate in red blood cells)

NEEDS TO BE UPDATED

- Common Name Folate
- Long Name: Folate
- Test Type: FOLATE
- Panels:
- Equivalent Tests: Folic Acid in serum
- Not Equivalent Tests: RBC folate
- Indications: To help diagnose the cause of anemia or neuropathy (nerve damage); to evaluate nutritional status in some patients; to monitor effectiveness of treatment for B12 or folate deficiency
- Description: Fasting for 6-8 hours before sample collection may be required.
- Related Tests: B12; CBC; CMP; Methylmalonic acid (MMA); Homocysteine

- Approximate Reference Range (Each site will have slight variations: Lower limit of normal: Approximately 1.5 - 3 ng/mL (or mcg/L). Upper limit of normal approximately 17 – 100 ng/mL. (Note: If RBC folate is inadvertently included, the reference range is one useful way to check to see if incorrect folate tests have been pulled. The lower limit of the normal range of RBC folate levels is approximately 100 – 180 and the upper limit of the normal range is RBC folate is approximately 360 – 800.)

- Comments: B12 and folate are primarily ordered to help diagnose the cause of macrocytic anemia. They are ordered as follow-up tests when large RBCs and a decreased hemoglobin concentration are found during a CBC test. B12 may be ordered with folate, by itself, or with other screening laboratory tests to help diagnose the cause of neuropathy. Either a serum or RBC folate test may be used to help detect a deficiency. Some doctors feel that the RBC folate test is more clinically relevant than serum folate, but there is not widespread agreement on this. High levels of B12 and folate are not usually clinically monitored. Increased folate may be seen with pernicious anemia and with vegetarian diets.

- Test Method Variance:

- Other:

  - Associated LOINC:
  - Associated CPT:

1.1.31 (GFR) Glomerular Filtration Rate Test Types

1. GFR_AA_CKD (Glomerular Filtration Rate, CKD-EPI, African American) ***NEEDS TO BE UPDATED***

   - Common Name: Estimated GFR, eGFR
   - Long Name: Glomerular Filtration Rate/1.73 sq M. predicted black (MDRD)
   - Test Type: GFR_AA_MD
   - Panels: Comprehensive metabolic panel, basic metabolic panel
   - Equivalent Tests: Calculated GFR

- Not Equivalent Tests: GFR measured by inulin clearance; Creatinine [SCr]; Creatinine clearance [CrCl]; Microalbumin; Cystatin C; Urine protein; Beta-2 microglobulin; GFR predicted non-Black MDRD (GFR_NAA_MD)
- Indications: Measure kidney function; screen for/detect kidney damage; monitor kidney status
- Description: This test estimates how much blood passes through glomeruli, the kidneys' filters, each minute. A measure of creatinine is required to calculate GFR. The MDRD equation was created from data from the Modification of Diet and Renal Disease (MDRD) Study, is based on 4 variables (i.e. Scr, age, gender, race), and was introduced in 2005. GFR= 175 x (Standardized Scr)-1.154 x (Age)-0.203 x (0.742 if female) x (1.120 if African American) See: `http://www.nkdep.nih.gov/professionals/gfr_calculators/`.
- Related Tests: SCr; CrCl
- Approximate Reference Range (National Kidney Foundation): GFR Description Kidney Damage Stage

90 ml/min Normal GFR 1 60-89 ml/min Mild decrease in GFR 2 30-59 ml/min Moderate decrease in GFR 3 15-29 ml/min Severe decrease in GFR 4 <15 ml/min Kidney failure 5

- Comments: The GFR_AA_MD test type should be used when your lab reports results include race. If GFR results are reported without regard to race, populate the GFR_MDRD test type. The GFR_AA_MD is only used for African Americans. Early on in GFR reporting there was no race adjustment; clinicians had to adjust the reported values themselves if their patient was African American. Still today many labs do not have race data associated with their samples, so they report two GFR values, one based on non-African Americans and the other for African Americans. This way clinicians just choose the appropriate result. This test is most accurate for poor kidney function so it may only be reported for values less than 60 ml/min. Although the MDRD equation for African Americans is not intended for use in calculating eGFR for pediatric patients, some HMOs may report eGFR using the MDRD for children (i.e., one of the MDRD TEST_TYPEs would be populated in the VDW for children at your site if that is the case).

- Test Method Variance: Prior to 2005, the equation was as follows: GFR= 186 x (Scr)-1.154 x (Age)-0.203 x (0.742 if female) x (1.120 if African American) Therefore, if a 38 year old black man had a serum creatinine of 1.6 in 2003, his GFR would be 62.5, but in 2008 that man would have a GFR of 58.8. It may appear there was a decline in renal function over time, however part of the decline is an artifact of the equation change. Identify when your site lab changed equations.
- Other: –
  - Associated LOINC:
  - Associated CPT:

2. GFR_AA_MD (Glomerular Filtration Rate, MDRD, African American)

   - Common Name: Estimated GFR, eGFR
   - Long Name: Glomerular Filtration Rate/1.73 sq M. predicted black (MDRD)
   - Test Type: GFR_AA_MD
   - Panels: Comprehensive metabolic panel, basic metabolic panel
   - Equivalent Tests: Calculated GFR
   - Not Equivalent Tests: GFR measured by inulin clearance; Creatinine [SCr]; Creatinine clearance [CrCl]; Microalbumin; Cystatin C; Urine protein; Beta-2 microglobulin; GFR predicted non-Black MDRD (GFR_NAA_MD)
   - Indications: Measure kidney function; screen for/detect kidney damage; monitor kidney status
   - Description: This test estimates how much blood passes through glomeruli, the kidneys' filters, each minute. A measure of creatinine is required to calculate GFR. The MDRD equation was created from data from the Modification of Diet and Renal Disease (MDRD) Study, is based on 4 variables (i.e. Scr, age, gender, race), and was introduced in 2005. GFR= 175 x (Standardized Scr)-1.154 x (Age)-0.203 x (0.742 if female) x (1.120 if African American)
     - See: `http://www.nkdep.nih.gov/professionals/gfr_calculators/`.
   - Related Tests: SCr; CrCl

- Approximate Reference Range (National Kidney Foundation):
  - GFR Description Kidney Damage Stage
  - 90 ml/min Normal GFR 1
  - 60-89 ml/min Mild decrease in GFR 2
  - 30-59 ml/min Moderate decrease in GFR 3
  - 15-29 ml/min Severe decrease in GFR 4
  - <15 ml/min Kidney failure 5
- Comments: The GFR_AA_MD test type should be used when your lab reports results include race. If GFR results are reported without regard to race, populate the GFR_MDRD test type. The GFR_AA_MD is only used for African Americans. Early on in GFR reporting there was no race adjustment; clinicians had to adjust the reported values themselves if their patient was African American. Still today many labs do not have race data associated with their samples, so they report two GFR values, one based on non-African Americans and the other for African Americans. This way clinicians just choose the appropriate result. This test is most accurate for poor kidney function so it may only be reported for values less than 60 ml/min. Although the MDRD equation for African Americans is not intended for use in calculating eGFR for pediatric patients, some HMOs may report eGFR using the MDRD for children (i.e., one of the MDRD TEST_TYPEs would be populated in the VDW for children at your site if that is the case).
- Test Method Variance: Prior to 2005, the equation was as follows:
  - GFR= 186 x (Scr)-1.154 x (Age)-0.203 x (0.742 if female) x (1.120 if African American)
  - Therefore, if a 38 year old black man had a serum creatinine of 1.6 in 2003, his GFR would be 62.5, but in 2008 that man would have a GFR of 58.8. It may appear there was a decline in renal function over time, however part of the decline is an artifact of the equation change. Identify when your site lab changed equations.
- Other: –
  - Associated LOINC: 48643-1
  - Associated CPT: 82565

3. GFR_AA_NS (Glomerular Filtration Rate, method not-specified, African American) ***NEEDS TO BE UPDATED***

   - Common Name: Estimated GFR, eGFR
   - Long Name: Glomerular Filtration Rate/1.73 sq M. predicted black (MDRD)
   - Test Type: GFR_AA_MD
   - Panels: Comprehensive metabolic panel, basic metabolic panel
   - Equivalent Tests: Calculated GFR
   - Not Equivalent Tests: GFR measured by inulin clearance; Creatinine [SCr]; Creatinine clearance [CrCl]; Microalbumin; Cystatin C; Urine protein; Beta-2 microglobulin; GFR predicted non-Black MDRD (GFR_NAA_MD)
   - Indications: Measure kidney function; screen for/detect kidney damage; monitor kidney status
   - Description: This test estimates how much blood passes through glomeruli, the kidneys' filters, each minute. A measure of creatinine is required to calculate GFR. The MDRD equation was created from data from the Modification of Diet and Renal Disease (MDRD) Study, is based on 4 variables (i.e. Scr, age, gender, race), and was introduced in 2005.

   GFR= 175 x (Standardized Scr)-1.154 x (Age)-0.203 x (0.742 if female) x (1.120 if African American) See: `http://www.nkdep.nih.gov/professionals/gfr_calculators/`.

   - Related Tests: SCr; CrCl
   - Approximate Reference Range (National Kidney Foundation):

   GFR Description Kidney Damage Stage 90 ml/min Normal GFR 1 60-89 ml/min Mild decrease in GFR 2 30-59 ml/min Moderate decrease in GFR 3 15-29 ml/min Severe decrease in GFR 4 <15 ml/min Kidney failure 5

   - Comments: The GFR_AA_MD test type should be used when your lab reports results include race. If GFR results are reported without regard to race, populate the GFR_MDRD test type. The GFR_AA_MD is only used for African Americans. Early on in GFR reporting there was no race adjustment; clinicians had to

adjust the reported values themselves if their patient was African American. Still today many labs do not have race data associated with their samples, so they report two GFR values, one based on non-African Americans and the other for African Americans. This way clinicians just choose the appropriate result. This test is most accurate for poor kidney function so it may only be reported for values less than 60 ml/min. Although the MDRD equation for African Americans is not intended for use in calculating eGFR for pediatric patients, some HMOs may report eGFR using the MDRD for children (i.e., one of the MDRD TEST_TYPEs would be populated in the VDW for children at your site if that is the case).

- Test Method Variance: Prior to 2005, the equation was as follows:

GFR= 186 x (Scr)-1.154 x (Age)-0.203 x (0.742 if female) x (1.120 if African American) Therefore, if a 38 year old black man had a serum creatinine of 1.6 in 2003, his GFR would be 62.5, but in 2008 that man would have a GFR of 58.8. It may appear there was a decline in renal function over time, however part of the decline is an artifact of the equation change. Identify when your site lab changed equations.

- Other: –

4. GFR_ARV (Glomerular Filtration Rate, ArvRate) ***NEEDS TO BE UPDATED***

5. GFR_CKD (Glomerular Filtration Rate, CKD-EPI) ***NEEDS TO BE UPDATED***

6. GFR_CKD_EPI (Glomerular Filtration Rate, CKD-EPI 2021, not based on race) ***NEEDS TO BE UPDATED***

7. GFR_CKD_EPI_CYS (Glomerular Filtration Rate, CKD-EPI 2021, creatine-cystatin not based on race) ***NEEDS TO BE UPDATED***

8. GFR_CYST (Glomerular Filtration Rate, Cystatin) ***NEEDS TO BE UPDATED***

9. GFR_F_MD (Glomerular Filtration Rate, MDRD, Female) ***NEEDS TO BE UPDATED***

10. GFR_M_MD (Glomerular Filtration Rate, MDRD, Male) ***NEEDS TO BE UPDATED***

11. GFR_MDRD (Glomerular Filtration Rate, MDRD)

    - Common Name: Estimated GFR, eGFR
    - Long Name: Glomerular Filtration Rate/1.73 sq M. predicted (MDRD)
    - Test Type: GFR_MDRD
    - Panels: Comprehensive metabolic panel, basic metabolic panel
    - Equivalent Tests: Calculated GFR
    - Not Equivalent Tests: GFR measured by inulin clearance; Creatinine [SCr]; Creatinine clearance [CrCl]; Microalbumin; Cystatin C; Urine protein; Beta-2 microglobulin
    - Indications: The GFR is used to measure kidney function. Clinicians may use GFR to screen for and detect kidney damage or monitor kidney status.
    - Description: This test estimates how much blood passes through glomeruli, the kidneys' filters, each minute. A measure of creatinine is required to calculate GFR. The MDRD equation was created from data from the Modification of Diet and Renal Disease (MDRD) Study and is based on 4 variables (i.e. Scr, age, gender, race). The equation is: GFR= 175 x (Standardized Scr)-1.154 x (Age)-0.203 x (0.742 if female) x (1.120 if African American).
        - See: `http://www.nkdep.nih.gov/professionals/gfr_calculators/`.
    - Related Tests: Serum creatinine; creatinine clearance
    - Approximate Reference Range (National Kidney Foundation):
        - GFR Description Kidney Damage Stage
        - 90 ml/min Normal GFR 1
        - 60-89 ml/min Mild decrease in GFR 2
        - 30-59 ml/min Moderate decrease in GFR 3
        - 15-29 ml/min Severe decrease in GFR 4
        - <15 ml/min Kidney failure 5
    - Comments: This TEST_TYPE should only be used when 1) you cannot tell whether the lab results include race, or 2) eGFR results are reported without regard to race. If eGFR results are reported as African American or non-African American, populate those TEST_TYPEs instead. Although the MDRD equation is not intended for use in calculating eGFR for pediatric patients, some

HMOs may report eGFR using the MDRD for children (i.e., one of the MDRD TEST_TYPEs would be populated in the VDW for children at your site if that is the case). The eGFR test is most accurate for poor kidney function so it may only be reported for values less than 60 ml/min. Because race is often not known, results under this test type name can be reported based on a non-African American (NAA) status and clinicians adjust the result if their patient was African American.

- Test Method Variance: Prior to 2005, the MDRD equation was:
  - GFR= 186 x (Scr)-1.154 x (Age)-0.203 x (0.742 if female) x (1.120 if African American)
  - Therefore if a 57 year old white man had a Scr of 1.1 in 2003 his GFR would be 73.3, but a man with the same characteristics in 2008 would have a GFR of 70.0. From a population level it may appear that there were declines in renal function over time, however part of the decline may be an artifact of the change in the equation. Identify when your site lab changed equations.
- Other: –
  - Associated LOINC: 33914-3, 76633-7, 77147-7
  - Associated CPT: 82565

12. GFR_NAA_CKD (Glomerular Filtration Rate, CKD-EPI, Non-African American) ***NEEDS TO BE UPDATED***

13. GFR_NAA_MD (Glomerular Filtration Rate, MDRD, Non-African American)

    - Common Name: Estimated GFR, eGFR
    - Long Name: Glomerular Filtration Rate/1.73 sq M. predicted non black (MDRD)
    - Test Type: GFR_NAA_MD
    - Panels: Comprehensive metabolic panel, basic metabolic panel
    - Equivalent Tests: Calculated GFR; eGFR
    - Not Equivalent Tests: GFR measured by inulin clearance; Creatinine [SCr]; Creatinine clearance [CrCl]; Microalbumin; Cystatin C; Urine protein; Beta-2 microglobulin; GFR predicted Black MDRD (GFR_AA_MD)

- Indications: The GFR is used to measure kidney function. Clinicians may use GFR to screen for and detect kidney damage or monitor kidney status.
- Description: This test estimates how much blood passes through glomeruli, the kidneys' filters, each minute. A measure of creatinine is required to calculate GFR. The MDRD equation was created from data from the Modification of Diet and Renal Disease (MDRD) Study, is based on 4 variables (i.e. Scr, age, gender, race), and was introduced in 2005. The equation is: GFR = 175 x (Standardized Scr)-1.154 x (Age)-0.203 x (0.742 if female)
  - See: `http://www.nkdep.nih.gov/professionals/gfr_calculators/`.
- Related Tests: SCr; CrCl
- Approximate Reference Range (National Kidney Foundation):
  - GFR Description Kidney Damage Stage
  - 90 ml/min Normal GFR 1
  - 60-89 ml/min Mild decrease in GFR 2
  - 30-59 ml/min Moderate decrease in GFR 3
  - 15-29 ml/min Severe decrease in GFR 4
  - <15 ml/min Kidney failure 5
- Comments: The "GFR_NAA_MD" TEST_TYPE should be used when your lab reports results that include race. If GFR results are reported without regard to race, populate the "GFR_MDRD" TEST_TYPE instead. Labs report race-specific GFR to allow clinicians to choose the correct result based on the race of their patients without having to do calculations. The GFR_NAA_MD is used for all races except African American. The eGFR test is most accurate for poor kidney function so it may only be reported for values less than 60 ml/min. Although the MDRD equation is not intended for use in calculating eGFR for pediatric patients, some HMOs may report eGFR using the MDRD for children (i.e., one of the MDRD TEST_TYPEs would be populated in the VDW for children at your site if that is the case).
- Test Method Variance: Prior to 2005, the equation was as follows
  - GFR= 186 x (Scr)-1.154 x (Age)-0.203 x (0.742 if female)
  - Therefore, if a 35 year old Asian female had a serum creatinine of 2 in 2003 her GFR would be 30.1, but a female with the same characteristics in 2008 would have a GFR of 28.4.

From a population level it appears there was a decline in renal function over time, however part of the decline is an artifact of the equation change. Identify when your site lab changed equations.

- Other: –
  - Associated LOINC: 48642-3
  - Associated CPT: 82565

14. GFR_NAA_NS (Glomerular Filtration Rate, Not Specified, Non-African American) ***NEEDS TO BE UPDATED***

15. GFR_NS (Glomerular Filtration Rate, Not Specified, Non-African American) ***NEEDS TO BE UPDATED***

16. GFR_SCH (Glomerular Filtration Rate, Schwartz)

    - Common Name: Estimated GFR, eGFR
    - Long Name: Glomerular Filtration Rate/1.73 sq M. predicted (Schwartz)
    - Test Type: GFR_SCH
    - Panels: Comprehensive metabolic panel, basic metabolic panel
    - Equivalent Tests: Calculated GFR; eGFR
    - Not Equivalent Tests: GFR measured by inulin clearance; Creatinine [SCr]; Creatinine clearance [CrCl]; Microalbumin; Cystatin C; Urine protein; Beta-2 microglobulin; estimated GFR MDRD
    - Indications: The GFR is used to measure kidney function in children. Clinicians may use GFR to screen for and detect kidney damage or monitor kidney status.
    - Description: This test estimates how much blood passes through glomeruli, the kidneys' filters, each minute. A measure of creatinine is required to calculate GFR. The Schwartz equation is for measuring GFR in the pediatric population (<18 years of age) and is based on 4 variables (i.e. Scr, height, age, gender).
      - GFR (mL/min/1.73 m2) = k x (height in cm)/ Scr in mg/dL Where k is a constant:
        * K=0.33 in premature infants
        * K=0.45 in term infants to 1 year of age

        * K=0.55 in children 1 to 13 years of age and adolescent females
        * K=0.70 in adolescent males (13 years and older)
    - Related Tests: SCr; CrCl
    - Approximate Reference Range:
        - GFR Description Kidney Damage Stage
        - 90 ml/min Normal GFR 1
        - 60-89 ml/min Mild decrease in GFR 2
        - 30-59 ml/min Moderate decrease in GFR 3
        - 15-29 ml/min Severe decrease in GFR 4
        - <15 ml/min Kidney failure 5
    - Comments: Many HMOs do not report GFR results using the Schwartz equation (even for pediatrics). Before populating this test type, please determine whether your health plan reports results using the Schwartz equation. This test is most accurate for poor kidney function so it may only be reported for values less than 75 ml/min/1.73 m2. Values any higher than 75 mL/min may be reported as "greater than or equal to 75 mL/min/1.73 m2".
    - Test Method Variance: –
    - Other: –
        - Associated LOINC: 50383-9, 50384-7
        - Associated CPT: 82565

1.1.32 GGT (GGTP, Gamma-glutamyl transpeptidase [or transferase] in blood/serum)

- Common Name: GGT or GGTP
- Long Name: GGTP, Gamma-glutamyl transpeptidase or transferase in blood/serum
- Test Type: GGT
- Panels: Liver Panel
- Equivalent Tests: N/A
- Not Equivalent Tests: GTT (glucose tolerance tests)

- Indications: To differentiate between liver and bone disease as a cause for elevated alkaline phosphatase (ALP). Both ALP and GGT are elevated in diseases of the bile ducts and some liver diseases, but only ALP is elevated in bone disease, adolescence or pregnancy. If the GGT level is normal in a person with a high ALP, the cause is most likely bone disease. Also, GGT is used to help detect liver disease and/or alcohol abuse.

- Description: GGT is an enzyme found in many organs, (kidney, spleen, heart, brain and pancreas) but the main source of GGT in the blood is the liver. GGT is increased in most diseases that cause acute damage to the liver or bile ducts but is usually not helpful in distinguishing between different causes of liver damage. GGT levels are sometimes increased with consumption of even small amounts of alcohol. Higher levels are found in chronic heavy drinkers than in people who consume less than 2 to 3 drinks per day or who only drink heavily on occasion (binge drinkers).

- Related Tests: AST; ALT; ALP; Bilirubin; Liver panel

- Approximate Reference Range (Each site will have slight variations): 1 - 94 IU/L. GGT increases with age in women, and is always somewhat higher in men than in women.

- Comments: GGT levels fall after meals, so fasting for at least 8 hours is recommended. Even small amounts of alcohol within 24 hours of a GGT test may cause a temporary increase in the GGT. GGT levels may be elevated in heart failure. Drugs that may cause an elevated GGT level include phenytoin, carbamazepine, and barbiturates such as phenobarbital. Also, nonsteroidal anti-inflammatory drugs (NSAIDs), lipidlowering drugs, antibiotics, histamine receptor blockers (used to treat excess stomach acid production), antifungal agents, antidepressants, and hormones such as testosterone, can increase GGT. Clofibrate and oral contraceptives can decrease GGT. Smoking can increase GGT.

- Test Method Variance:

- Other:

  - Associated LOINC: 2324-2
  - Associated CPT: 82977

1.1.33 GLU_F (Glucose, Fasting Serum/Plasma)

- Common Name: Fasting serum glucose
- Long Name: Blood Sugar Fasting
- Test Type: GLU_F
- Panels:
- Equivalent Tests: Fasting plasma glucose, whole blood fasting glucose
- Not Equivalent Tests: Random glucose or fasting period not specified; glucose tolerance test (although may include a fasting glucose); 2-hour post parandial (after meal); glucose on other body fluid such as cerebrospinal fluid, urine, synovial, plueral or peritoneal fluids; glucose phosphate isomerase; glucose-6-phosphate dehydrogenase; glucocorticoids. Many tests using GLY prefix are not a blood glucose level.
- Indications: Fasting glucose is used for screening for diabetes or hypoglycemia and to monitor progression or control of diabetes. Also, fasting glucose is used to assist in determining medication adjustments for managing diabetes. Certain drugs used to treat conditions other than diabetes can also affect Fasting Blood Sugar.
- Description: In general, it is recommended that you fast 8 hours before having a fasting blood glucose test. In persons with diabetes, however, glucose levels are often checked both while fasting and after meals to provide the best control of diabetes.
- Related Tests:
- Approximate Reference Range (Each site will have slight variations): Approximately 65- 115 mg/dL
- Comments: Delay in transport or delay in separating serum from cells can falsely decrease glucose values.
- Test Method Variance: Capillary specimens can vary from serum/plasma values by 10%. Some meters have different settings for different lot numbers of test strips. "Lack of circulation" may invalidate capillary glucose. Preferred specimen is a plasma from fluoride/oxalate anticoagulated specimen tube to prevent cells from metabolizing glucose during transport.

- Other:
  - Associated LOINC: 101476-0, 10450-5, 14768-6, 14769-4, 14770-2, 14771-0, 14996-3, 1547-9, 1549-5, 1550-3, 1552-9, 1554-5, 1556-0, 1557-8, 1558-6, 17865-7, 25680-0, 35184-1, 39997-2, 40148-9, 40193-5, 40858-3, 41604-0, 47622-6, 53049-3, 70208-4, 76629-5, 77145-1, 87421-4, 88365-2
  - Associated CPT: (CPT Code does not differentiate between random and fasting) 82947

1.1.34 GLU_RAN (Glucose, Random, not known if patient was fasting or known that patient was not fasting)

- Common Name: Glucose Random, Glucose-fasting period not indicated
- Long Name: Blood Sugar Random or Not Specified
- Test Type: GLU_RAN
- Panels: Basic metabolic panel, comprehensive metabolic profile
- Equivalent Tests: plasma glucose, whole blood glucose
- Not Equivalent Tests: Fasting glucose. Glucose tolerance (although may include a fasting glucose). 2-Hour post parandial (after meal). Glucose on other body fluid such as cerebral spinal fluid, urine, synovial, pleural or peritoneal fluids. Glucose phosphate isomerase, Glucose-6-Phosphate Dehydrogenase, Glucocorticoids. Many tests using GLY prefix are not a glucose level.
- Indications: Random glucose is used for screening for diabetes or hypoglycemia and to monitor progression or control of diabetes. Also used to adjust medication dosage for diabetes. Certain drugs used to treat conditions other than diabetes can also affect blood glucose.
- Description: In general, regardless of whether food or drink has been consumed, blood glucose test should be less than 200 mg/dL. Some will use 150 mg/dL if it has been $>$ 1 hour since consuming small meal or beverage. If random is greater than ~200, follow-up testing is indicated. Can also be used to validate glucose meter results.
- Related Tests:

- Approximate Reference Range (Each site will have slight variations): Approximately <200 mg/dL
- Comments: Delay in transport or delay in separating serum from cells can falsely decrease glucose values.
- Test Method Variance: Capillary specimens can vary from serum/plasma values by 10%. Some meters have different settings for different lot numbers of test strips. "Lack of circulation" may invalidate capillary glucose. Preferred specimen is a plasma from fluoride/oxalate anti-coagulated specimen tube to prevent cells from metabolizing glucose during transport.
- Other:
  - Associated LOINC: 100746-7, 14743-9, 14749-6, 15074-8, 2339-0, 2340-8, 2341-6, 2345-7, 32016-8, 35211-2, 39480-9, 39481-7, 41651-1, 41652-9, 41653-7, 51596-5, 5914-7, 72516-8, 74774-1, 77135-2, 96594-7
  - Associated CPT: (CPT Code does not differentiate between random and fasting) 82947

1.1.35 (HCO3) Bicarbonate Test Types

NEEDS TO BE UPDATED

1. HCO3_A (Bicarbonate in Arterial blood) ***NEEDS TO BE UPDATED***
2. HCO3_C (Bicarbonate in Capillary blood) ***NEEDS TO BE UPDATED***
3. HCO3_V (Bicarbonate in Venous blood) ***NEEDS TO BE UPDATED***
4. HCO3_NS (Bicarbonate source not specified) ***NEEDS TO BE UPDATED***

1.1.36 HDL (High density lipoprotein cholesterol)

- Common Name: HDL
- Long Name: Cholesterol High Density Lipoprotein

- Test Type: HDL
- Panels: LIPID PROFILE
- Equivalent Tests: whole blood HDL
- Not Equivalent Tests: Total Cholesterol, VLDL - very low density lipoprotein cholesterol, LDL - low density lipoprotein cholesterol, any apolipoproteins
- Indications: High-density lipoproteins (HDL) is one of the 5 major groups of lipoproteins (chylomicrons, VLDL, IDL, LDL, HDL) which enable lipids like cholesterol and triglycerides to be transported within blood. In healthy individuals, about 30% of blood cholesterol is carried by HDL. It is hypothesized that HDL can remove cholesterol from atheroma within arteries and transport it back to the liver for excretion or re-utilization. HDL-bound cholesterol is sometimes called "good cholesterol", or HDL-C. A high level of HDL-C seems to protect against cardiovascular diseases, and low HDL cholesterol levels (less than 40 mg/dL) increase the risk for heart disease.
- Description: Indirect HDL is derived from values obtained by processing the serum/plasma (precipitation, magnetic separation, ultracentrifugation) to remove other cholesterol forms. The testing method for total cholesterol is used to quantify the remaining cholesterol. Direct HDL cholesterol is measured from unprocessed serum/plasma.
- Related Tests:
- Approximate Reference Range (Each site will have slight variations): greater than 40 mg/dl
- Comments: HDL is generally the inverse of LDL and considered the "good" cholesterol. HDL levels greater than 60 mg/dL may actually protect people from heart disease and remove atherosclerotic plaques.
- Test Method Variance:
- Other:
  - Associated LOINC: 14646-4, 2085-9, 35197-3 12772-0 (electrophoresis, prop is Acnc) 49130-8 (electrophoresis, prop is MCnc) 18263-4 (system is ser/plas. ultracentrifugate)
  - Associated CPT: 83718

1.1.37 HGBA1C (Hemoglobin A1C)

NEEDS TO BE UPDATED

1.1.38 IL_6 (Interleukin 6)

NEEDS TO BE UPDATED

1.1.39 IL_6_QL (Interleukin 6 presence)

NEEDS TO BE UPDATED

1.1.40 K (Potassium, Serum)

- Common Name: Serum Potassium
- Long Name: Potassium Serum
- Test Type: K
- Panels: Basic metabolic profile, comprehensive metabolic profile, general health panel, renal function panel
- Equivalent Tests: Plasma potassium, whole blood potassium, electrolytes
- Not Equivalent Tests: Body fluids other than blood are commonly tested ie. Urine. KOH - fungal screen. Potassium salts of meds.
- Indications: Electrolyte balance, cardiac toxicity. Certain drugs can affect potassium homeostasis and potassium is monitored to assess the efficacy and safety of several drug therapies.
- Description: One of the few tests reported in SI units - mmol/L (also called mEq/dL. For K, mmol/L and mEq/dL have the same reference range.). Excreted by kidney at variable rates depending on hydration status, blood pressure and many other factors.
- Related Tests:
- Approximate Reference Range (Each site will have slight variations): ~ 3.5-5.0 mmol/L

- Comments: Low extracellular values and high intracellular values can be a source of specimen processing error that elevate K ie. order of blood collection tubes, capillary collection, leaving tourniquet or clenching fist too long, delay in separating from cells, hemolysis. Lipemia can cause faslely low values. Errors are common and test will often be repeated making it difficult to select among multiple test results..
- Test Method Variance:
- Other: Studies show fist pumping can increase a patient's potassium as much as 20%, in addition to ionized calcium.
  - Associated LOINC: 2823-3, 29349-8 (post dialysis), 32713-0, 39789-3, 39790-1, 41656-0, 51618-7 (pre_dialysis), 6298-4, 77142-8
  - Associated CPT: 80051, 84132

1.1.41 LDH (Lactate dehydrogenase, total in blood/serum)

- Common Name: LDH
- Long Name: Lactate dehydrogenase, Total in blood/serum (also known as: LD; Lactic dehydrogenase; Total LDH)
- Test Type: LDH
- Panels: N/A
- Equivalent Tests: N/A
- Not Equivalent Tests: N/A
- Indications: As a screening tool to rule out various cellular or tissue damage. If total LDH is elevated, then LDH isoenzymes (i.e., subtypes) or other tests such as ALT, AST or ALP may be ordered to help diagnose the condition and to help determine which organs are involved. LDH is used to monitor damage caused by muscle trauma or injury and to help identify hemolytic anemia. Occasionally LDH is ordered when a patient has symptoms of a heart attack.
- Description: LDH is widely distributed in body tissues. Elevated levels of LDH (and changes in the ratio of the LDH isoenzymes) are used to indicate acute or chronic tissue damage and to monitor progressive conditions. LDH levels rise as cellular destruction begins, peak, and

then begin to fall. LDH exists in 5 subtypes or isoenzymes, which differ slightly in structure:

  - LDH-1 is found primarily in heart muscle and red blood cells.
  - LDH-2 is concentrated in white blood cells.
  - LDH-3 is highest in the lung.
  - LDH-4 is highest in the kidney, placenta, and pancreas.
  - LDH-5 is highest in the liver and skeletal muscle
  - Elevated levels of LDH may be seen with cerebrovascular accident (stroke), drugs (anesthetics, aspirin, narcotics, procainamide, alcohol), hemolytic anemia, pernicious anemia (megaloblastic anemia), infectious mononucleosis, intestinal and pulmonary infarction, kidney and liver disease, muscular dystrophy, pancreatitis and lymphoma or other cancers. Low and normal levels of LDH do not usually indicate a problem. Low levels are sometimes seen when a patient ingests large amounts of ascorbic acid (vitamin C).

- Related Tests: All CK tests; ALT AST; ALP; LDH isoenzymes
- Approximate Reference Range (Each site will have slight variations): 100-210 IU/L
- Comments: Various conditions can affect LDH results. For example, strenuous exercise can cause temporary elevations in LDH; hemolysis of the blood specimen can cause falsely elevated results; if platelet count is increased, serum LDH can be artificially high.
- Test Method Variance:
- Other:
  - Associated LOINC: 14804-9; 14805-6; 2532-0
  - Associated CPT: 83615

1.1.42 (LDL) Cholesterol Low Density Lipoprotein Test Types

1. LDL_CLC_F, Calculated, Fasting (Low density lipoprotein cholesterol, calculated, patient was fasting)
   - Common Name: LDL

- Long Name: Cholesterol Low Density Lipoprotein Calculated Fasting
- Test Type: LDL_CLC_F
- Panels: LIPID PROFILE
- Equivalent Tests: Whole blood LDL
- Not Equivalent Tests: Total Cholesterol, VLDL - very low density lipoprotein cholesterol, HDL
- high density lipoprotein cholesterol, any apolipoproteins
- Indications: LDL cholesterol is used to predict the risk of developing atherosclerosis heart disease. It is sometimes referred to as "bad cholesterol." Of all the forms of cholesterol in the blood, the LDL cholesterol is considered the most important in determining risk of heart disease. LDL cholesterol is the primary target of cholesterol-lowering treatment. Since treatment decisions are often based on LDL values, this test may be used to monitor levels after the start of diet or exercise programs or to determine whether or not prescribing one of the lipid-lowering drugs would be useful.
- Description: LDL = total cholesterol level - HDL - [triglyceride level $\div$ 5]. Calculation is invalid when triglycerides are $>$400mg/dL
- Related Tests: Lipid Profile, Triglycerides, Total Cholesterol, VLDL - very low density lipoprotein cholesterol, HDL - high density lipoprotein cholesterol, any apolipoproteins
- Approximate Reference Range (Each site will have slight variations): less than 130mg/dL
- Comments: Calculated LDL reflects an indirect method of testing. Chemicals are added to the serum/plasma and selected fractions are precipitated out of the sample and the test is performed on the remaining supernatant. The preferred specimen is fasting. Calculated LDL is not accurate on specimens that have triglycerides levels exceeding 400.
- Test Method Variance:
- Other:
  - Associated LOINC: 13457-7, 2089-1
  - Associated CPT: 83721

2. LDL_CLC_NS, Calculated, Random (Low density lipoprotein cholesterol, calculated measure, not known if patient was fasting)

    - Common Name: LDL
    - Long Name: Cholesterol Low Density Lipoprotein Calculated - fasting not specified
    - Test Type: LDL_CLC_NS
    - Panels: LIPID PROFILE
    - Equivalent Tests: Whole blood LDL
    - Not Equivalent Tests: Total Cholesterol, VLDL - very low density lipoprotein cholesterol, HDL
    - high density lipoprotein cholesterol, any apolipoproteins
    - Indications: LDL cholesterol is used to predict the risk of developing atherosclerosis heart disease. It is sometimes referred to as "bad cholesterol." Of all the forms of cholesterol in the blood, the LDL cholesterol is considered the most important form in determining risk of heart disease. LDL cholesterol is the primary target of cholesterol-lowering treatment. Since treatment decisions are often based on LDL values, this test may be used to monitor levels after the start of diet or exercise programs or to determine whether or not prescribing one of the lipid-lowering drugs would be useful.
    - Description: LDL = total cholesterol level - HDL - [triglyceride level $\div$ 5]. Calculation is invalid when triglycerides are $>$400mg/dL
    - Related Tests: Lipid Profile, Triglycerides, Total Cholesterol, VLDL - very low density lipoprotein cholesterol, HDL - high density lipoprotein cholesterol, any apolipoproteins
    - Approximate Reference Range (Each site will have slight variations): $<$ 130mg/dL
    - Comments: Calculated LDL reflects an indirect method of testing. Chemicals are added to the serum/plasma and selected fractions are precipitated out of the sample and the test is performed on the remaining supernatant. The preferred specimen is fasting. Whether “fasting” is indicated with the lab result determines if it is categorized as fasting or fasting status unknown. Calculated LDL is not accurate on specimens that have triglycerides levels exceeding 400.

- Test Method Variance:
- Other:
  - Associated LOINC: 13457-7, 2089-1, 39469-2
  - Associated CPT: 83721

3. LDL_DIRECT (Low density lipoprotein cholesterol, direct measure, fasting status not a consideration)

   - Common Name: LDL, direct
   - Long Name: Cholesterol Low Density Lipoprotein Direct
   - Test Type: LDL_DIRECT
   - Panels: LIPID PROFILE
   - Equivalent Tests: whole blood LDL
   - Not Equivalent Tests: Total Cholesterol, VLDL - very low density liprotein cholesterol, HDL - high density lipoprotein cholesterol, any apolipoproteins (especially B)
   - Indications: LDL cholesterol is used to predict the risk of developing atherosclerosis heart disease. It is sometimes referred to as "bad cholesterol." Of all the forms of cholesterol in the blood, the LDL cholesterol is considered the most important form in determining risk of heart disease. LDL cholesterol is the primary target of cholesterol-lowering treatment. Since treatment decisions are often based on LDL values, this test may be used to monitor levels after the start of diet or exercise programs or to determine whether or not prescribing one of the lipid-lowering drugs would be useful.
   - Description: Direct measure LDL are run directly on neat serum or plasma. Direct measurements of LDL are not interfered with by elevated triglycerides.
   - Related Tests: Lipid Profile, Triglycerides, Total Cholesterol, VLDL - very low density lipoprotein cholesterol, HDL - high density lipoprotein cholesterol, any apolipoproteins
   - Approximate Reference Range (Each site will have slight variations): $<$ 130mg/dL
   - Comments: The direct method reflects the reagent system for testing. In contrast to calculated (indirectly measured) lipoproteins, direct methods can be reported for specimens that have triglyceride concentrations greater than 400.

- Test Method Variance:
- Other:
  - Associated LOINC: 18262-6, 69419-0
  - Associated CPT: 83721

4. LDL_NS Method not Indicated (Low density lipoprotein cholesterol, not known whether calculated or direct, fasting status not considered)

   - Common Name: LDL
   - Long Name: Cholesterol Low Density Lipoprotein Not Specified – can not determine if calculated or direct
   - Test Type: LDL_NS
   - Panels: LIPID PROFILE
   - Equivalent Tests: whole blood LDL
   - Not Equivalent Tests: Total Cholesterol, VLDL - very low density lipoprotein cholesterol, HDL high density lipoprotein cholesterol
   - Indications: LDL cholesterol is used to predict the risk of developing atherosclerosis heart disease. It is sometimes referred to as "bad cholesterol." Of all the forms of cholesterol in the blood, the LDL cholesterol is considered the most important form in determining risk of heart disease. LDL cholesterol is the primary target of cholesterol-lowering treatment. Since treatment decisions are often based on LDL values, this test may be used to monitor levels after the start of diet or exercise programs or to determine whether or not prescribing one of the lipid-lowering drugs would be useful.
   - Description: LDL = total cholesterol level - HDL - [triglyceride level $\div$ 5]. Calculation is invalid when triglycerides are $>$400mg/dL
   - Related Tests: Lipid Profile, Triglycerides, Total Cholesterol, VLDL - very low density lipoprotein cholesterol, HDL - high density lipoprotein cholesterol, any apolipoproteins
   - Approximate Reference Range (Each site will have slight variations): $<$ 130mg/dL
   - Comments: Use this test type only for those LDL test results where you cannot determine with the method was calculated or direct.

- Test Method Variance:
- Other:
  - Associated LOINC: 22748-8, 35198-1
  - Associated CPT: 83721

1.1.43 LIPASE (Lipase)

NEEDS TO BE UPDATED

1.1.44 MAGNESIUM (Magnesium)

- Common Name: Serum Magnesium, Mg++
- Long Name: Magnesium, total in blood/serum
- Test Type: MAGNESIUM
- Panels:
- Equivalent Tests:
- Not Equivalent Tests:
- Indications: Symptoms (such as weakness, irritability, cardiac arrhythmia, nausea, and/or diarrhea) that may be due to too much or too little magnesium or abnormal calcium or potassium levels. Renal function and certain drugs can affect magnesium levels. Abnormal levels of magnesium are most frequently seen in conditions or diseases that cause affect excretion of magnesium by the kidneys or that cause impaired absorption in the intestines.
- Description:
- Related Tests:
- Approximate Reference Range (Each site will have slight variations): ~ 1.3-2.1 mEq/L
- Comments: Many antacids and laxatives contain magnesium and may affect blood levels. Magnesium blood levels may be low normally in the second and third trimesters of pregnancy.
- Test Method Variance:

- Other:
  - Associated LOINC: 11554-3, 19123-9, 21377-7, 2593-2, 2601-3, 35249-2, 55937-7
  - Associated CPT: 83735

1.1.45 (PG) Pregnancy Determination Test Types

1. PG_B_QL (Pregnancy Determination, Serum Beta Human Choriogonadotropin, qualitative) ***NEEDS TO BE UPDATED***
2. PG_B_QL_U (Pregnancy Determination, Urine Beta Human Choriogonadotropin, qualitative) ***NEEDS TO BE UPDATED***
3. PG_B_QN (Pregnancy Determination, Beta Human Choriogonadotropin quantitative) ***NEEDS TO BE UPDATED***
4. PG_B_QN_U (Pregnancy Determination, Urine Beta Human Choriogonadotropin quantitative) ***NEEDS TO BE UPDATED***
5. PG_QL (Pregnancy Determination - Beta Human Choriogonadotropin qualitative) ***NEEDS TO BE UPDATED***
6. PG_QL_U (Pregnancy Determination, Urine Beta Human Choriogonadotropin qualitative) ***NEEDS TO BE UPDATED***
7. PG_QN (Pregnancy Determination, Beta Human Choriogonadotropin quantitative) ***NEEDS TO BE UPDATED***
8. PG_QN_U (Pregnancy Determination, Urine Beta Human Choriogonadotropin quantitative) ***NEEDS TO BE UPDATED***

1.1.46 (PSA) Prostate specific antigen Test Types

1. PSA (Prostate specific antigen, total)
   - Common Name: PSA, Total (screening or diagnostic)
   - Long Name: Prostate Specific Antigen, Total PSA
   - Test Type: PSA
   - Panels: N/A
   - Equivalent Tests: N/A

- Not Equivalent Tests: PAP (Prostatic Acid Phosphatase), Not equivalent to PSA from nonblood specimens. Free and protein bound forms are considered distinct tests not to be included with total.
- Indications:
- Description: Prostate-specific antigen (PSA) is a normal protein produced by the prostate gland and value does not necessarily indicate cancer. The PSA test measures the total level of PSA in the blood. PSA in other forms such as Free, "nicked"or pro-PSA are normally included in total PSA. PSA is a member of the kallikrein-related serine protease super family.
- Related Tests: Free PSA ratio
- Approximate Reference Range (Each site will have slight variations): 0 - 4.0 ng/mL is usual normal range.
- Comments: The U.S. Food and Drug Administration (FDA) has approved the use of the PSA test to help detect prostate cancer in men age 50 and older (40 if family history). The FDA has also approved the PSA test to monitor patients with a history of prostate cancer to see if the cancer has recurred. Most men with an elevated PSA test result turn out not to have cancer; only 25 to 35 percent of men who have a biopsy due to an elevated PSA level actually have prostate cancer. The test may indicate when biopsy is indicated.
- Test Method Variance: Different manufacturers have different molecular specificity. Comparing values over time need to consider different reagent systems if lab changes are made. Results between manufacturer/instrumentation may not be linear.
- Other:
  - Associated LOINC: 100716-0, 19195-7, 19197-3, 2857-1, 34611-4, 35741-8, 83112-3
  - Associated CPT: 84153, 84152

2. PSA_FREE(Prostate specific antigen free in blood/serum/plasma)
   - Common Name: Free PSA
   - Long Name: Prostate Specific Antigen Free
   - Test Type: PSA_FREE

- Panels: N/A
- Equivalent Tests: N/A
- Not Equivalent Tests: PSA forms that are bound to blood proteins which includes total.
- Indications:
- Description: PSA circulates in the blood in two forms: Free or bound to a protein molecule.
- Related Tests:
- Approximate Reference Range (Each site will have slight variations): Men with prostate cancer have a lower percentage of total PSA that is free than men without prostate cancer.
- Comments: The free PSA test may add value for elevated PSA values. With benign prostate conditions (such as BPH), there is usually more free PSA, while cancer usually produces more of the protein bound form.
- Test Method Variance:
- Other:
  - Associated LOINC: 10886-0, 19201-3, 19203-9, 83113-1
  - Associated CPT: 84154

3. PSA_P_FREE (Percent Free Prostate specific antigen [Ag], ratio of free to total)

   - Common Name: Percent Free PSA
   - Long Name: Prostate specific Ag free/Prostate specific Ag Total
   - Test Type: PSA_%_FREE
   - Panels: N/A
   - Equivalent Tests: N/A
   - Not Equivalent Tests: Individual PSA isoforms. Result is a ratio of two isoforms
   - Indications:
   - Description: PSA circulates in the blood in two forms: Free or bound to a protein molecule.
   - Related Tests:

- Approximate Reference Range (Each site will have slight variations): 5% – 40 %. Expressed as a percent of unbound PSA over total PSA
- Comments:
- Test Method Variance:
- Other:
  - Associated LOINC: 12841-3, 14120-0, 72576-2
  - Associated CPT: 84154, 84153, 84152

1.1.47 SODIUM (Blood or Serum Sodium)

- Common Name: Serum Sodium; Na+
- Long Name: Sodium, serum/blood
- Test Type: Sodium
- Panels: Basic metabolic profile, comprehensive metabolic profile, electrolyte panel, general health panel, renal function panel
- Equivalent Tests:
- Not Equivalent Tests: body fluids other than blood (i.e. urine)
- Indications: Electrolyte balance; may be monitored to evaluate kidney function and in chronic conditions, like high or low blood pressure and congestive heart failure, or with dehydration or edema. Certain drugs can affect sodium levels.
- Description:
- Related Tests:
- Approximate Reference Range (Each site will have slight variations): ~ 136-145 mEq/L or mmol/L
- Comments:
- Test Method Variance:
- Other:
  - Associated LOINC: 2947-0, 2951-2, 32717-1 , 39791-9, 39792-7, 41657-8, 42570-2, 77139-4
  - Associated CPT: 84295

1.1.48 (T4) Thyroxine Test Types

1. T4_FREE (Thyroxine Free)

    - Common Name: Free T4
    - Long Name: Thyroxine (T4) Free
    - Test Type: T4_FREE
    - Panels: Thyroid panel
    - Equivalent Tests: N/A
    - Not Equivalent Tests: Total Thyroxine (T4), Free Thyroxine Index, Thyroid stimulating hormone (TSH)
    - Indications: Free T4 is used in diagnosing hyper- or hypothyroidism in conjunction with TSH. It may be ordered at regular intervals to monitor the effectiveness of treatment when a patient is being treated for a known thyroid disorder.
    - Description: Thyroxine (T4) Free evaluates thyroid function by measuring the T4 produced by the thyroid gland. T4 Free measures the level of thyroxine circulating in the bloodstream that is not bound to protein (i.e., it is "free") as opposed to the Total T4 test which measures the total amount of thyroxine that is bound to thyroxine-binding globulin. Since free T4 is the active form of thyroxine, the free T4 test is considered a more accurate reflection of thyroid hormone function and, in most cases, it has replaced the total T4 test. Total T4 is being phased out due to the more sensitive and meaningful free T4 testing.
    - Related Tests: TSH; Free T4 Index
    - Approximate Reference Range: 0.8-1.5 ng/dL for adults (neonatal and pediatric reference ranges differ)
    - Comments: Only 0.02% of T4 circulates unbound to proteins. In general, high T4 free results may indicate an overactive thyroid gland (hyperthyroidism), and low T4 free results may indicate an underactive thyroid gland (hypothyroidism). Pregnancy can cause changes in the production and elimination of thyroid hormones resulting in altered reference ranges throughout the pregnancy.
    - Test Method Variance: There are 4 different assays to evaluate free T4. Results commonly reported as ng/dL but can also include pmol/L or pg/dL.

- Other:
  - Associated LOINC: 100978-6, 14920-3, 27987-7, 3024-7, 35228-6, 53349-7, 53350-5, 58838-4, 6892-4, 70217-5, 83121-4, 83122-2
  - Associated CPT: 84439

2. T4_FREE_I (Thyroxine Free Index)
   - Common Name: FTI
   - Long Name: Thyroxine (T4) Free Index; Serum Free Thyroxine Index
   - Test Type: T4_FREE_I
   - Panels: Thyroid Panel
   - Equivalent Tests: Also known as "T7"
   - Not Equivalent Tests: Thyroxine (T4) Total, Thyroxine (T4) Free
   - Indications: This test is used to monitor thyroid function in patients who have abnormal protein binding. It may be ordered at regular intervals to monitor the effectiveness of treatment when a patient is being treated for a known thyroid disorder.
   - Description: Thyroxine index is calculated by total T4 multiplied by T3 resin uptake (percentage) to estimate the amount of free thyroxine circulating in the blood. This calculation adjusts for the effects of alterations in thyroid-binding protein on the total serum T4 assay. This can be useful when evaluating patients who have factors that can increase or decrease thyroidbinding protein.
   - Related Tests: T4 Total; T3 Resin Uptake; T4 Free
   - Approximate Reference Range: 1.0-4.0 units; 0.8-2.7 ng/dL for adults (neonatal and pediatric reference ranges differ)
   - Comments: In general, high T4 index results may indicate an overactive thyroid gland (hyperthyroidism), and low T4 index results may indicate an underactive thyroid gland (hypothyroidism).
   - Test Method Variance:
   - Other: Thyroxine free index is rarely used today.
     - Associated LOINC: 3022-1, 32215-6
     - Associated CPT:

3. T4_TOTAL (Thyroxine Total)

- Common Name: Total T4
- Long Name: Thyroxine (T4) Total; Total Serum Thyroxine
- Test Type: T4_TOTAL
- Panels: Thyroid Panel
- Equivalent Tests: N/A
- Not Equivalent Tests: Thyroxine (T4) Free Thyroxine Index, Total T3, Thyroid stimulating hormone (TSH), newborn genetic screenings
- Indications: Total T4 is used to diagnose hyper- or hypothyroidism as well as for suspected subacute thyroiditis. It may be ordered at regular intervals to monitor the effectiveness of treatment when a patient is being treated for a known thyroid disorder.
- Description: Thyroxine (T4) Total evaluates thyroid function by measuring the total thyroxine in the bloodstream (both bound and unbound to thyroxine-binding globulin and other proteins).
- Related Tests: TSH; Serum T3 Resin Uptake; thyroxine-binding globulin (TBG); T4 Free; Free T4 Index
- Approximate Reference Range: 4.0-12.5 mcg/dL for adults (neonatal and pediatric reference ranges differ)
- Comments: In general, high T4 Total results indicate an overactive thyroid gland (hyperthyroidism), and low T4 Total results indicate an underactive thyroid gland (hypothyroidism). T4 Total results are affected by the amount of protein in the blood that is available to bind the T4. T3 resin uptake test is usually measured in conjunction with T4 total to factor out the interference of T3 binding to thyroid-binding protein. Total T4 is being phased out due to the more sensitive and meaningful free T4 testing – free T4 is not affected by the amount of protein in the blood.
- Test Method Variance:
- Other: Usually ordered along with or following a TSH test. Do not include T4 total from newborn genetic screening.
  - Associated LOINC: 14921-1, 20451-1, 3025-4, 3026-2, 31144-9, 31145-6, 35226-0, 38506-2, 83119-8, 83120-6
  - Associated CPT: 84436

1.1.49 TOT_CHOLES (Cholesterol, Total)

- Common Name: Cholesterol, Total
- Long Name: Cholesterol Total
- Test Type: TOT_CHOLES
- Panels: LIPID PROFILE
- Equivalent Tests:
- Not Equivalent Tests: LDL - very low density lipoprotein Cholesterol, LDL - Low Density lipoprotein Cholesterol, HDL - High Density lipoprotein Cholesterol, any apolipoproteins
- Indications:
- Description: Cholesterol is a molecule (chemically a steroid) that is essential for life. It forms the membranes for cells in all organs and tissues in your body. It is used to make hormones essential for development, growth, and reproduction. It forms bile acids that are needed to absorb nutrients from food. Levels of cholesterol are influenced by its production in the liver and the ingestion of dietary fats. Bile acids are released into the intestine, aid in digestion, and then are mostly reabsorbed. A small amount of your body's cholesterol circulates in the blood in complex particles called lipoproteins. These lipoproteins include some particles that carry excess cholesterol away for disposal (i.e., HDL cholesterol) and some particles that deposit cholesterol in tissues and organs (i.e., LDL cholesterol). The test for cholesterol measures total cholesterol (good [HDL] and bad [e.g., LDL]) that is carried in the blood by lipoproteins. Lowering LDL cholesterol reduces coronary heart disease and ischemic stroke.
- Related Tests:
- Approximate Reference Range (Each site will have slight variations):
- Comments:
- Test Method Variance:
- Other:

  - Associated LOINC: 2093-3, 14647-2, 35200-5, 48620-9 (ultracentrig)
  - Associated CPT: 82465

1.1.50 TOT_PROT (Protein, total in blood/serum)

- Common Name: Total Protein
- Long Name: Total Protein in blood/serum
- Test Type: TOT_PROT
- Panels: Liver Panel or Liver Function Test (LFT); Comprehensive Metabolic Panel (CMP)
- Equivalent Tests: N/A
- Not Equivalent Tests: N/A
- Indications: To determine nutritional status as part of a general health checkup; to screen for certain liver and kidney disorders and other diseases; to investigate the cause of abnormal pooling of fluid in tissue (edema).
- Description: Proteins are important building blocks of cells and tissues; they are important for body growth, development, and health. They form the structural part of most organs and make up enzymes and hormones that regulate body functions. The total protein test measures the total amount of the two classes of proteins (albumin and globulin) in blood plasma. Low total protein levels can suggest a liver disorder, a kidney disorder, or a disorder in which protein is not digested or absorbed properly. Low levels may be seen in severe malnutrition and with conditions that cause malabsorption, such as Celiac disease or inflammatory bowel disease. High total protein levels may be seen with chronic inflammation, infections such as viral hepatitis or HIV, or bone marrow disorders such as multiple myeloma.
- Related Tests: Albumin; Liver panel; Protein electrophoresis
- Approximate Reference Range (Each site will have slight variations): 6.0 to 8.3 gm/dL (g/dL; grams per deciliter).

- Comments: Prolonged application of a tourniquet during blood collection can result in a blood sample that has a higher protein concentration than the rest of the circulation. This will mean that the test result for total protein will be falsely elevated. Drugs that may decrease protein levels include estrogens and oral contraceptives.
- Test Method Variance:
- Other:
  - Associated LOINC: 2885-2
  - Associated CPT: 84155

1.1.51 TRANSFERRIN (Transferrin in Serum)

NEEDS TO BE UPDATED

1.1.52 TRIGL_F (Triglycerides, Fasting)

- Common Name: Triglycerides, fasting
- Long Name: Triglycerides Fasting
- Test Type: TRIGL_F
- Panels: LIPID PROFILE
- Equivalent Tests: N/A
- Not Equivalent Tests: N/A
- Indications:
- Description: Triglycerides are the body's storage form for fat. Most triglycerides are found in adipose (fat) tissue. Some triglycerides circulate in the blood to provide fuel for muscles to work. Extra triglycerides are found in the blood after eating a meal - when fat is being sent from the gut to adipose tissue for storage.
- Related Tests:
- Approximate Reference Range (Each site will have slight variations): $<$150 mg/dL (1.70 mmol/L)

- Comments: Elevated triglycerides can be indicated by a "lipemic" comment in any other blood/serum/plasma laboratory test. Triglycerides are circulating forms of fat and are related both to heredity and to diet. You might think that a high fat diet will raise triglycerides and a low fat diet would lower triglycerides. However, carbohydrate appears to be the most important dietary predictor of triglycerides. Diets high in carbohydrates can lead to transient increases in triglycerides. This is why fasting specimens are usually preferred.
- Test Method Variance:
- Other:
  - Associated LOINC: 1644-4, 17081-1, 3048-6, 30524-3, 47210-0
  - Associated CPT: (CPT code doesnot differentiate between fasting or not) 84478

1.1.53 TRIGL_NS (Triglycerides, not known if patient was fasting

- Common Name: Triglycerides
- Long Name: Triglycerides - fasting not specified
- Test Type: TRIGL_NS
- Panels: LIPID PROFILE
- Equivalent Tests: N/A
- Not Equivalent Tests: N/A
- Indications:
- Description: Triglycerides are the body's storage form for fat. Most triglycerides are found in adipose (fat) tissue. Some triglycerides circulate in the blood to provide fuel for muscles to work. Extra triglycerides are found in the blood after eating a meal - when fat is being sent from the gut to adipose tissue for storage.
- Related Tests:
- Approximate Reference Range (Each site will have slight variations): $<$150 mg/dL (1.70 mmol/L)

- Comments: Elevated triglycerides can be indicated by a "lipemic" comment in any other blood/serum/plasma laboratory test. Triglycerides are circulating forms of fat and are related both to heredity and to diet. You might think that a high fat diet will raise triglycerides and a low fat diet would lower triglycerides. However, carbohydrate appears to be the most important dietary predictor of triglycerides. Diets high in carbohydrates can lead to transient increases in triglycerides. This is why fasting specimens are usually preferred. Occasionally, a non-fasting triglyceride sample can be useful. Non-fasting triglycerides are sometimes used to identify risk that was not predicted by a standard fasting lipid profile. The non-fasting test is most valuable when the sample is taken two to four hours after a meal.
- Test Method Variance:
- Other:
  - Associated LOINC: 14927-8, 2571-8, 28554-4, 3043-7, 3049-4, 35217-9, 70218-3, 96598-8
  - Associated CPT: (CPT code doesnot differentiate between fasting or not) 84478

1.1.54 (TROP) Troponin Test Types

1. TROP_I_QN (Troponin I Cardiac Quantitative)
   - Common Name: Cardiac-specific troponin (I)
   - Long Name: Cardiac-specific Troponin I Quantitative
   - Test Type: TROP_I_QN
   - Panels: N/A
   - Equivalent Tests: TnI; cTnI (see Description below)
   - Not Equivalent Tests: All CK tests; Myoglobin TROP_T_QN; TROP_T_QL; cTnT; TnT
   - Indications: The troponin test is used to help diagnose a heart attack, to detect and evaluate mild to severe heart injury, and to distinguish chest pain due to other causes. Either troponin I or troponin T test can be performed; usually a laboratory will offer one test or the other. Troponins are sometimes ordered along with other cardiac biomarkers such as CK_MB or myoglobin. Troponins are the preferred tests for a suspected heart attack

because they are more specific for heart injury than other tests and remain elevated for a longer period of time.

- Description: Troponins are a family of proteins found in skeletal and heart muscle fibers. The three different types of troponin are called troponin C (TnC), troponin T (TnT), and troponin I (TnI). Together, these three proteins regulate muscular contraction. Two of the proteins, TnI and TnT, occur in a form found only in the heart. These cardiac-specific troponins, called cTnI and cTnT, are normally present in very small quantities in the blood. When there is damage to heart muscle cells, cardiac troponins I and T are released into the circulation. The more damage there is, the greater the concentration of cardiac troponins I and T in the blood. The troponin test is usually ordered when a patient with a suspected heart attack comes into the emergency room and often repeated at 6 and 12 hours later. Typically, 2 or 3 troponin tests are done over a 12- to 16-hour period. In patients with stable angina, a troponin test may be ordered if the patient's symptoms get worse (e.g., increased risk of a heart attack in the near future).
- Related Tests: CK; CK_MB; Cardiac biomarkers; TROP_T_QL; TROP_T_QN; cTnT; TnT
- Approximate Reference Range: Cardiac troponin levels are normally so low they cannot be detected with most blood tests. (Troponin I: $<$ 10 microgram (mcg)/L).
- Comments: When a patient has significantly elevated troponin concentrations, some form of damage to the heart is likely. When a patient with chest pain/known stable angina has normal troponin values, it is likely that the heart has not been injured. The test is not affected by damage to other muscles.
- Test Method Variance:
- Other:
  - Associated LOINC: 10839-9, 16255-2, 42757-5, 49563-0, 76399-5, 89577-1, 89578-9, 89579-7
  - Associated CPT: 84484

2. TROP_T_QL (Troponin T Cardiac - Qualitative)

- Common Name: Cardiac-specific troponin (T qualitative)
- Long Name: Cardiac-specific Troponin T Qualitative

- Test Type: TROP_T_QL
- Panels: N/A
- Equivalent Tests:
- Not Equivalent Tests: CK; CK – MB; Myoglobin; Cardiac biomarkers; TROP_T_QN; TROP_I_QN; cTnI; TnI
- Indications: The troponin test is used to help diagnose a heart attack, to detect and evaluate mild to severe heart injury, and to distinguish chest pain due to other causes. Either troponin I or troponin T test can be performed; usually a laboratory will offer one test or the other. Troponins are sometimes ordered along with other cardiac biomarkers such as CK_MB or myoglobin. Troponins are the preferred tests for a suspected heart attack because they are more specific for heart injury than other tests and remain elevated for a longer period of time.
- Description: Troponins are a family of proteins found in skeletal and heart muscle fibers. The three different types of troponin are called troponin C (TnC), troponin T (TnT), and troponin I (TnI). Together, these three proteins regulate muscular contraction. Two of the proteins, TnI and TnT, occur in a form found only in the heart. These cardiac-specific troponins, called cTnI and cTnT, are normally present in very small quantities in the blood. When there is damage to heart muscle cells, cardiac troponins I and T are released into the circulation. The more damage there is, the greater the concentration of cardiac troponins I and T in the blood. The troponin test is usually ordered when a patient with a suspected heart attack comes into the emergency room and often repeated at 6 and 12 hours later. Typically, 2 or 3 troponin tests are done over a 12- to 16-hour period. In patients with stable angina, a troponin test may be ordered if the patient's symptoms get worse (e.g., increased risk of a heart attack in the near future).
- Related Tests: CK; CK_MB; Myoglobin; Cardiac biomarkers TROP_T_QN; TROP_I_QN
- Approximate Reference Range: Positive or negative for Troponin T elevated levels.
- Comments: When a patient has significantly elevated troponin concentrations, some form of damage to the heart is likely. When a patient with chest pain/known stable angina has normal tro-

ponin values, it is likely that the heart has not been injured. The test is not affected by damage to other muscles.

- Test Method Variance:
- Other:
  - Associated LOINC: 33204-9, 48426-1
  - Associated CPT: 84512

3. TROP_T_QN (Troponin T Cardiac - Quantitative)

   - Common Name: Cardiac-specific troponin (T)
   - Long Name: Cardiac-specific Troponin T Quantitative
   - Test Type: TROP_T_QN
   - Panels: N/A
   - Equivalent Tests: TnT; cTnT (see Description below)
   - Not Equivalent Tests: CK; CK – MB; Myoglobin; Cardiac biomarkers; TROP_T_QL; TROP_I_QN; cTnI; TnI
   - Indications: The troponin test is used to help diagnose a heart attack, to detect and evaluate mild to severe heart injury, and to distinguish chest pain due to other causes. Either troponin I or troponin T test can be performed; usually a laboratory will offer one test or the other. Troponins are sometimes ordered along with other cardiac biomarkers such as CK_MB or myoglobin. Troponins are the preferred tests for a suspected heart attack because they are more specific for heart injury than other tests and remain elevated for a longer period of time.
   - Description: Troponins are a family of proteins found in skeletal and heart muscle fibers. The three different types of troponin are called troponin C (TnC), troponin T (TnT), and troponin I (TnI). Two of the proteins, TnI and TnT, occur in a form found only in the heart. These cardiacspecific troponins (cTnI and cTnT) are normally present in very small quantities in the blood. When there is damage to heart cells, cardiac troponins I and T are released into the circulation. The troponin test is usually ordered when a patient with a suspected heart attack comes into the emergency room and often repeated at 6 and 12 hours later. Typically, 2 or 3 troponin tests are done over a 12- to 16-hour period. In patients with stable angina, a troponin test may be ordered if the patient's symptoms get worse (e.g., increased risk of a heart attack in the near future).

- Related Tests: CK; CK_MB; Myoglobin; Cardiac biomarkers TROP_T_QL; TROP_I_QN
- Approximate Reference Range: Cardiac troponin levels are normally so low they cannot be detected with most blood tests. (Troponin T: 0–0.1 g/L [micrograms per liter[).
- Comments: When a patient has significantly elevated troponins, heart damage is likely. When a patient with chest pain/known stable angina has normal troponin values, it is likely that the heart has not been injured. The test is not affected by damage to other muscles.
- Test Method Variance:
- Other:
  - Associated LOINC: 101911-6, 101912-4, 101915-7, 101916-5, 48425-3, 6597-9, 6598-7, 67151-1
  - Associated CPT: 84484

1.1.55 (TSH) Thyroid Stimulating Hormone Test Types

1. TSH (Thyroid Stimulating Hormone, Thyrotropin)

   - Common Name: TSH
   - Long Name: Thyroid Stimulating Hormone; Thyrotropin
   - Test Type: TSH
   - Panels:
   - Equivalent Tests:
   - Not Equivalent Tests:
   - Indications: The doctor may order a TSH test when a patient has symptoms of hyper- or hypothyroidism and/or when a patient has an enlarged thyroid gland. It may be ordered at regular intervals to monitor the effectiveness of treatment when a patient is being treated for a known thyroid disorder.
   - Description: The TSH test is often the test of choice for evaluating thyroid function and/or symptoms of hyper- or hypothyroidism. It is frequently ordered along with or preceding a T4 test. Other thyroid tests that may be ordered include a T3 test and thyroid antibodies (if autoimmunerelated thyroid disease is suspected). TSH testing is used to:

  - diagnose a thyroid disorder in a person with symptoms,
  - screen newborns for an underactive thyroid,
  - monitor thyroid replacement therapy in people with hypothyroidism
  - diagnose and monitor female infertility problems,
  - help evaluate the function of the pituitary gland (occasionally), and
  - screen adults for thyroid disorders, although expert opinions vary on who can benefit from screening and at what age to begin.
- Related Tests: T4, T3, Thyroid Antibodies
- Approximate Reference Range (Each site will have slight variations): 0.32-5.50 uIU/mL.
- Comments: No test preparation is needed. Certain medications — including aspirin and thyroid-hormone replacement therapy — can interfere with the TSH test, so the doctor should be informed about any drugs that are being taken.
- Test Method Variance:
- Other: This test measures the amount of thyroid-stimulating hormone (TSH) in your blood. TSH is produced by the pituitary gland, a tiny organ located below the brain and behind the sinus cavities. It is part of the body's feedback system to maintain stable amounts of the thyroid hormones thyroxine (T4) and triiodothyronine (T3) in the blood. Thyroid hormones help control the rate at which the body uses energy. When concentrations decrease in the blood, the hypothalamus (an organ in the brain) releases thyrotropin releasing hormone (TRH). This stimulates the release of TSH by the pituitary gland. The TSH in turn stimulates the production and release of T4 and T3 by the thyroid gland, a small butterfly-shaped gland that lies in the neck flat against the windpipe. When all three organs are functioning normally, thyroid production turns on and off to maintain constant blood thyroid hormone levels. If there is pituitary dysfunction, then increased or decreased amounts of TSH may result. When TSH concentrations are decreased, the thyroid will make and release inappropriate amounts of T4 and T3 and the patient may experience symptoms associated with hyperthyroidism, such as rapid heart rate, weight loss, nervousness, hand tremors, irritated eyes,

and difficulty sleeping. If there is elevated TSH and subsequent decreased production of thyroid hormones (hypothyroidism), the patient may experience symptoms such as weight gain, dry skin, constipation, cold intolerance, and fatigue. In addition to pituitary dysfunction, hyper- or hypothyroidism can occur if there is a problem with the hypothalamus (insufficient or excessive TRH). Thyroid hormone levels may also be altered by a variety of thyroid diseases regardless of the amount of TSH present in the blood.

  - Associated LOINC: 11579-0, 11580-8, 14297-6, 14999-7, 1642-8, 27975-2, 29575-8, 3015-5, 3016-3
  - Associated CPT: 84443

2. (TSH_BSU-DEPRECATED) Beta Subunit (Thyroid Stimulating Hormone Beta Subunit), Quantitative

   - Common Name: TSH Beta Subunit, Quantitative
   - Long Name: Thyroid Stimulating Hormone Beta Subunit Quantitative
   - Test Type: TSH_BSU
   - Panels:
   - Equivalent Tests:
   - Not Equivalent Tests:
   - Indications: The doctor may order a TSH test when a patient has symptoms of hyper- or hypothyroidism and/or when a patient has an enlarged thyroid gland. It may be ordered at regular intervals to monitor the effectiveness of treatment when a patient is being treated for a known thyroid disorder.
   - Description: The TSH test is often the test of choice for evaluating thyroid function and/or symptoms of hyper- or hypothyroidism. It is frequently ordered along with or preceding a T4 test. Other thyroid tests that may be ordered include a T3 test and thyroid antibodies (if autoimmunerelated thyroid disease is suspected). TSH testing is used to:
     - diagnose a thyroid disorder in a person with symptoms,
     - screen newborns for an underactive thyroid,
     - monitor thyroid replacement therapy in people with hypothyroidism
     - diagnose and monitor female infertility problems,

  - help evaluate the function of the pituitary gland (occasionally), and
  - screen adults for thyroid disorders, although expert opinions vary on who can benefit from screening and at what age to begin.
- Related Tests: TSH, T4, T3, Thyroid Antibodies
- Approximate Reference Range (Each site will have slight variations):
- Comments: No test preparation is needed. Certain medications — including aspirin and thyroid-hormone replacement therapy — can interfere with the TSH test, so the doctor should be informed about any drugs that are being taken.
- Test Method Variance:
- Other: This test measures the amount of thyroid-stimulating hormone (TSH) in your blood. TSH is produced by the pituitary gland, a tiny organ located below the brain and behind the sinus cavities. It is part of the body's feedback system to maintain stable amounts of the thyroid hormones thyroxine (T4) and triiodothyronine (T3) in the blood. Thyroid hormones help control the rate at which the body uses energy. When concentrations decrease in the blood, the hypothalamus (an organ in the brain) releases thyrotropin releasing hormone (TRH). This stimulates the release of TSH by the pituitary gland. The TSH in turn stimulates the production and release of T4 and T3 by the thyroid gland, a small butterfly-shaped gland that lies in the neck flat against the windpipe. When all three organs are functioning normally, thyroid production turns on and off to maintain constant blood thyroid hormone levels. If there is pituitary dysfunction, then increased or decreased amounts of TSH may result. When TSH concentrations are increased, the thyroid will make and release inappropriate amounts of T4 and T3 and the patient may experience symptoms associated with hyperthyroidism, such as rapid heart rate, weight loss, nervousness, hand tremors, irritated eyes, and difficulty sleeping. However, because of the feedback loop, usually TSH production has been "turned off" (i.e., TSH concentrations are low) when there is hyperthyroidism. If there is increased production of TSH and subsequent decreased production of thyroid hormones (hypothyroidism), the patient may

experience symptoms such as weight gain, dry skin, constipation, cold intolerance, and fatigue. In addition to pituitary dysfunction, hyper- or hypothyroidism can occur if there is a problem with the hypothalamus (insufficient or excessive TRH). Usually, by the time TSH is measured in a patient with hypothyroidism, the TSH is very high (i.e., the pituitary is trying to get the thyroid to make more thyroid hormone). Thyroid hormone levels may also be altered by a variety of thyroid diseases regardless of the amount of TSH present in the blood.

  - Associated LOINC:
  - Associated CPT:

3. (TSH_LA-DEPRECATED) Long Acting (Thyroid Stimulator Long Acting)

   - Common Name: Long Acting Thyroid Stimulator
   - Long Name: Thyroid Stimulator Long Acting
   - Test Type: TSH_LA
   - Panels:
   - Equivalent Tests:
   - Not Equivalent Tests:
   - Indications: The doctor may order a TSH test when a patient has symptoms of hyper- or hypothyroidism and/or when a patient has an enlarged thyroid gland. It may be ordered at regular intervals to monitor the effectiveness of treatment when a patient is being treated for a known thyroid disorder.
   - Description:
   - Related Tests: TSH, T4, T3, Thyroid Antibodies
   - Approximate Reference Range (Each site will have slight variations):
   - Comments: No test preparation is needed. Certain medications — including aspirin and thyroid-hormone replacement therapy — can interfere with the TSH test, so the doctor should be informed about any drugs that are being taken.
   - Test Method Variance:
   - Other:

4. (TSH_SCRN-DEPRECATED) Screen (Thyroid Stimulating Hormone, Screen), Blood

    - Common Name: Thyroid stimulating hormone screen in blood
    - Long Name: Thyroid Stimulating Hormone, Screen, Blood
    - Test Type: TSH_SCRN
    - Panels:
    - Equivalent Tests:
    - Not Equivalent Tests:
    - Indications: The doctor may order a TSH test when a patient has symptoms of hyper- or hypothyroidism and/or when a patient has an enlarged thyroid gland. It may be ordered at regular intervals to monitor the effectiveness of treatment when a patient is being treated for a known thyroid disorder. TSH screening is routinely performed in the United States on newborns as part of each state's newborn screening program. The American Thyroid Association recommends that adults older than age 35 be screened for thyroid disease with a TSH test every five years, although other organizations, such as the U.S. Preventive Services Task Force, challenge this recommendation. Several organizations recommend instead screening women over 50 or those at high risk for thyroid disorders, such as pregnant and postpartum women.
    - Description: The TSH test is often the test of choice for evaluating thyroid function and/or symptoms of hyper- or hypothyroidism. It is frequently ordered along with or preceding a T4 test. Other thyroid tests that may be ordered include a T3 test and thyroid antibodies (if autoimmunerelated thyroid disease is suspected).

    TSH testing is used to:

    - diagnose a thyroid disorder in a person with symptoms,
    - screen newborns for an underactive thyroid,
    - monitor thyroid replacement therapy in people with hypothyroidism
    - diagnose and monitor female infertility problems,
    - help evaluate the function of the pituitary gland (occasionally), and

- screen adults for thyroid disorders, although expert opinions vary on who can benefit from screening and at what age to begin.
- Related Tests: TSH, T4, T3, Thyroid Antibodies
- Approximate Reference Range (Each site will have slight variations): Low, normal or high.
- Comments: No test preparation is needed. Certain medications — including aspirin and thyroid-hormone replacement therapy — can interfere with the TSH test, so the doctor should be informed about any drugs that are being taken.
- Test Method Variance:
- Other: This test measures the amount of thyroid-stimulating hormone (TSH) in your blood. TSH is produced by the pituitary gland, a tiny organ located below the brain and behind the sinus cavities. It is part of the body's feedback system to maintain stable amounts of the thyroid hormones thyroxine (T4) and triiodothyronine (T3) in the blood. Thyroid hormones help control the rate at which the body uses energy. When concentrations decrease in the blood, the hypothalamus (an organ in the brain) releases thyrotropin releasing hormone (TRH). This stimulates the release of TSH by the pituitary gland. The TSH in turn stimulates the production and release of T4 and T3 by the thyroid gland, a small butterfly-shaped gland that lies in the neck flat against the windpipe. When all three organs are functioning normally, thyroid production turns on and off to maintain constant blood thyroid hormone levels. If there is pituitary dysfunction, then increased or decreased amounts of TSH may result. If there is thyroid dysfunction, then the amount of TSH will be inversely related to the thyroid dysfunction (i.e., TSH will be low with overactive thyroid).

1.1.56 (U_ACR) Microalbumin to Creatine Ratio Test Types

1. U_ACR (Microalbumin [or albumin] to creatinine ratio in urine)
    - Common Name: ACR
    - Long Name: Microalbumin or albumin to creatinine ratio in urine
    - Test Type: U_ACR
    - Panels: N/A

- Equivalent Tests: N/A
- Not Equivalent Tests: Serum or urine Albumin, serum prealbumin, serum or urine microalbumin, Urinalysis
- Indications: To screen for possible kidney disorder or for early kidney damage in diabetics
- Description: The microalbumin test is an early indicator of kidney failure. It measures the tiny amounts of albumin that the body begins to release into the urine several years before significant kidney damage becomes apparent. Albumin is a protein that is produced in the liver and is present in high concentrations in the blood. When the kidneys are functioning properly, virtually no albumin is present in the urine. Damaged or diseased kidneys lose their ability to filter proteins out of the urine. Patients who have consistently detectible amounts of albumin in their urine (known as microalbuminuria) have an increased risk of developing progressive kidney failure and cardiovascular disease. Microalbumin measurements can be obtained using urine collected over a 24-hour period, for a specified amount of time (e.g., 4 hours or overnight), or randomly (spot). When a creatinine measurement is performed along with a random microalbumin, the result is the ACR. Creatinine, a byproduct of muscle metabolism, is normally excreted into the urine on a consistent basis. Its level in the urine is relatively stable. Since the concentration (or dilution) of urine varies throughout the day, this property of creatinine allows its measurement to be used as a corrective factor in random/spot urine samples. When a creatinine measurement is performed along with a random microalbumin, the result is the ACR (which the American Diabetes Association states is the preferred test for screening for microalbuminuria).
- Related Tests: Albumin; Creatinine; Microalbumin
- Approximate Reference Range: Normal is $<$ 30 mcg albumin/mg creatinine; microalbuminuria = 30 - 299 mcg albumin/mg creatinine (spot or random urine sample)
- Comments: Elevated results may also be caused by vigorous exercise, blood in the urine, urinary tract infection, dehydration, and some drugs.
- Test Method Variance:
- Other:

- Associated LOINC: 14585-4, 14959-1, 30000-4, 32294-1, 77253-3, 89998-9, 9318-7
- Associated CPT:

2. U_ACR12 (12-hour Microalbumin [or albumin] to creatinine ratio in urine) ***NEEDS TO BE UPDATED***

   - Common Name: ACR
   - Long Name: Microalbumin or albumin to creatinine ratio in urine
   - Test Type: U_ACR
   - Panels: N/A
   - Equivalent Tests: N/A
   - Not Equivalent Tests: Serum or urine Albumin, serum prealbumin, serum or urine microalbumin, Urinalysis
   - Indications: To screen for possible kidney disorder or for early kidney damage in diabetics
   - Description: The microalbumin test is an early indicator of kidney failure. It measures the tiny amounts of albumin that the body begins to release into the urine several years before significant kidney damage becomes apparent. Albumin is a protein that is produced in the liver and is present in high concentrations in the blood. When the kidneys are functioning properly, virtually no albumin is present in the urine. Damaged or diseased kidneys lose their ability to filter proteins out of the urine. Patients who have consistently detectible amounts of albumin in their urine (known as microalbuminuria) have an increased risk of developing progressive kidney failure and cardiovascular disease. Microalbumin measurements can be obtained using urine collected over a 24-hour period, for a specified amount of time (e.g., 4 hours or overnight), or randomly (spot). When a creatinine measurement is performed along with a random microalbumin, the result is the ACR. Creatinine, a byproduct of muscle metabolism, is normally excreted into the urine on a consistent basis. Its level in the urine is relatively stable. Since the concentration (or dilution) of urine varies throughout the day, this property of creatinine allows its measurement to be used as a corrective factor in random/spot urine samples. When a creatinine measurement is performed along with a random microalbumin,

the result is the ACR (which the American Diabetes Association states is the preferred test for screening for microalbuminuria).

- Related Tests: Albumin; Creatinine; Microalbumin
- Approximate Reference Range: Normal is $<$ 30 mcg albumin/mg creatinine; microalbuminuria = 30 - 299 mcg albumin/mg creatinine (spot or random urine sample)
- Comments: Elevated results may also be caused by vigorous exercise, blood in the urine, urinary tract infection, dehydration, and some drugs.
- Test Method Variance:
- Other:
  - Associated LOINC:
  - Associated CPT:

3. U_ACR24 (24-hour Microalbumin [or albumin] to creatinine ratio in urine) ***NEEDS TO BE UPDATED***

   - Common Name: ACR
   - Long Name: Microalbumin or albumin to creatinine ratio in urine
   - Test Type: U_ACR
   - Panels: N/A
   - Equivalent Tests: N/A
   - Not Equivalent Tests: Serum or urine Albumin, serum prealbumin, serum or urine microalbumin, Urinalysis
   - Indications: To screen for possible kidney disorder or for early kidney damage in diabetics
   - Description: The microalbumin test is an early indicator of kidney failure. It measures the tiny amounts of albumin that the body begins to release into the urine several years before significant kidney damage becomes apparent. Albumin is a protein that is produced in the liver and is present in high concentrations in the blood. When the kidneys are functioning properly, virtually no albumin is present in the urine. Damaged or diseased kidneys lose their ability to filter proteins out of the urine. Patients who have consistently detectible amounts of albumin in their urine (known as microalbuminuria) have an increased risk

of developing progressive kidney failure and cardiovascular disease. Microalbumin measurements can be obtained using urine collected over a 24-hour period, for a specified amount of time (e.g., 4 hours or overnight), or randomly (spot). When a creatinine measurement is performed along with a random microalbumin, the result is the ACR. Creatinine, a byproduct of muscle metabolism, is normally excreted into the urine on a consistent basis. Its level in the urine is relatively stable. Since the concentration (or dilution) of urine varies throughout the day, this property of creatinine allows its measurement to be used as a corrective factor in random/spot urine samples. When a creatinine measurement is performed along with a random microalbumin, the result is the ACR (which the American Diabetes Association states is the preferred test for screening for microalbuminuria).

- Related Tests: Albumin; Creatinine; Microalbumin
- Approximate Reference Range: Normal is $<$ 30 mcg albumin/mg creatinine; microalbuminuria = 30 - 299 mcg albumin/mg creatinine (spot or random urine sample)
- Comments: Elevated results may also be caused by vigorous exercise, blood in the urine, urinary tract infection, dehydration, and some drugs.
- Test Method Variance:
- Other:
  - Associated LOINC:
  - Associated CPT:

1.1.57 U_CREAT (Creatinine in Urine)

- Common Name: Urine Creatinine (spot or random)
- Long Name: Creatinine in Urine
- Test Type: U_CREAT
- Panels: N/A
- Equivalent Tests: This TEST_TYPE should only be used for spot or random (single point in time) urine creatinine measurements.

- Not Equivalent Tests: 24 hour urine creatinine; BUN; serum creatinine; BUN/creatinine ratio; eGFR; Creatinine clearance; Urinalysis; Urine protein to creatinine ratio; microalbumin; albumin/creatinine ratio
- Indications: To determine kidney functioning and to monitor treatment for kidney disease
- Description: Creatinine, a byproduct of muscle metabolism, is normally excreted into the urine on a consistent basis. It is a good measure of how well the kidneys are working. Urine creatinine may be used with other urine tests as a correction factor. Since it is produced and removed at a relatively constant rate, the amount of urine creatinine can be compared to the amount of another substance being measured. Examples include the urine protein/creatinine ratio (UP/CR) and the microalbumin/creatinine ratio (also known as albumin/creatinine ratio, ACR).
- Related Tests: 24 hour urine creatinine; BUN; BUN/creatinine ratio; eGFR; Creatinine clearance; Urinalysis; Urine protein to creatinine ratio; microalbumin; albumin/creatinine ratio
- Approximate Reference Range: Although spot or random urine creatinine values are usually reported in mg, random urine creatinine levels have no standard reference ranges. They are usually used with other tests to reference levels of other substances measured in the urine.
- Comments: The quantity of urine creatinine produced depends on the size of the person and their muscle mass. For this reason, creatinine concentrations will be slightly higher in men than in women and children. Drugs such as aminoglycosides (vancomycin, gentamicin) can cause kidney damage and so creatinine is monitored. Other drugs, such as cephalosprins (cefoxitin), may increase creatinine concentration without reflecting kidney damage.
- Test Method Variance:
- Other:
  - Associated LOINC: 14683-7, 2161-8, 35204-7, 35674-1, 39977-4, 39982-4, 40129-9, 40133-1, 55593-8
  - Associated CPT: 82570

1.1.58 U_CREAT24 (24-Hour Creatinine in Urine)

- Common Name: 24 Hour Urine Creatinine
- Long Name: 24-Hour Creatinine in Urine
- Test Type: U_CREAT24
- Panels: N/A
- Equivalent Tests: This TEST_TYPE should only be used for 24 hour urine creatinine collections.
- Not Equivalent Tests: U_CREAT: BUN; serum creatinine; BUN/creatinine ratio; eGFR; Creatinine clearance; Urinalysis; Urine protein to creatinine ratio; microalbumin; albumin/creatinine ratio
- Indications: To determine kidney functioning and to monitor treatment for kidney disease
- Description: Creatinine, a byproduct of muscle metabolism, is normally excreted into the urine on a consistent basis. It is used to measure kidney functioning. A combination of blood and urine creatinine levels may be used to calculate a creatinine clearance (how effectively the kidney is filtering small molecules such as creatinine out of the blood). Although shorter collection periods (3-8 hours) appear to be adequate and more reliable, creatinine clearance is routinely calculated using a 24 hour urine collection.
- Related Tests: U_CREAT: BUN; BUN/creatinine ratio; eGFR; Creatinine clearance; Urinalysis; Urine protein to creatinine ratio; microalbumin; albumin/creatinine ratio
- Approximate Reference Range: 20 – 28 mg/kg24 hours (men); 15 – 21 mg/kg/24 hours (women)
- Comments: The quantity of creatinine produced depends on a person's size and muscle mass. Therefore, creatinine concentrations will be slightly higher in men than in women and children. Drugs such as aminoglycosides (vancomycin, gentamicin) can cause kidney damage and so creatinine is monitored. Other drugs, such as cephalosprins (cefoxitin), may increase creatinine concentration without reflecting kidney damage.

- Test Method Variance:
- Other:
  - Associated LOINC: 14684-5, 20624-3, 2162-6, 25886-3, 35251-8, 35262-5
  - Associated CPT: 82575

1.1.59 U_HEME_DIP (Hemoglobin in urine by dipstick)

NEEDS TO BE UPDATED

1.1.60 U_MIC_ALB (Microalbumin [or albumin] in urine)

- Common Name: Urine Microalbumin
- Long Name: Microalbumin or albumin in urine
- Test Type: U_MIC_ALB
- Panels: N/A
- Equivalent Tests: This TEST_TYPE should only be used for spot or random urine microalbumin determinations.
- Not Equivalent Tests: Albumin, Prealbumin, Urinalysis, U_ACR; U_MICALB24
- Indications: To screen for possible kidney disorder or for early kidney damage in diabetics
- Description: The microalbumin test is an early indicator of kidney failure. It measures the tiny amounts of albumin that the body begins to release into the urine several years before significant kidney damage becomes apparent. Albumin is a protein that is produced in the liver. It is present in high concentrations in the blood, but when the kidneys are functioning properly, virtually no albumin is allowed to leak through into the urine. If a person's kidneys become damaged or diseased, however, they begin to lose their ability to filter proteins out of the urine. This is frequently seen in chronic diseases, such as diabetes and hypertension, with increasing amounts of protein in the urine reflecting increasing kidney failure. Since the albumin molecule is small, it is one of the first proteins to be detected in the urine with

kidney damage. Patients who have consistently detectible amounts of albumin in their urine (microalbuminuria) have an increased risk of developing progressive kidney failure and cardiovascular disease in the future. Microalbumin measurements can be obtained using urine collected over a 24-hour period, for a specified amount of time (e.g., 4 hours or overnight), or randomly (spot).

- Related Tests: Albumin; Creatinine; U_ACR; U_MICALB24
- Approximate Reference Range: Normal is $<$ 30 mcg albumin; microalbuminuria = 30-299 mcg albumin (spot or random urine)
- Comments: The National Kidney Foundation recommends that diabetics between 12 and 70 years of age have a urine microalbumin test annually. If microalbuminuria is detected, it should be confirmed by retesting and, if positive on 2 of 3 determinations over a 3-6 month period, it is considered to be present and appropriate treatment is advised.
- Test Method Variance:
- Other:
  - Associated LOINC: 100158-5, 14957-5, 1754-1, 53531-0, 77158-4, 89999-7
  - Associated CPT: 82043, 82042

1.1.61 U_MICALB24 (24-Hour Microalbumin in urine)

- Common Name: 24-hour Urine Microalbumin
- Long Name: 24-hour Microalbumin in urine
- Test Type: U_MICALB24
- Panels: N/A
- Equivalent Tests: This TEST_TYPE should only be used for 24-hour urine collections for microalbumin determinations.
- Not Equivalent Tests: Albumin, Prealbumin, Urinalysis; U_ACR; U_MIC_ALB
- Indications: To screen for possible kidney disorder or for early kidney damage in diabetics

- Description: The microalbumin test is an early indicator of kidney failure. It measures the tiny amounts of albumin that the body begins to release into the urine several years before significant kidney damage becomes apparent. Albumin is a protein that is produced in the liver. It is present in high concentrations in the blood, but when the kidneys are functioning properly, virtually no albumin is allowed to leak through into the urine. If a person's kidneys become damaged or diseased, however, they begin to lose their ability to filter proteins out of the urine. This is frequently seen in chronic diseases, such as diabetes, hypertension, heart failure, cirrhosis, or systemic lupus erythematosus (SLE) with increasing amounts of protein in the urine reflecting increasing kidney failure. Since the albumin molecule is small, it is one of the first proteins to be detected in the urine with kidney damage. Patients who have consistently detectible amounts of albumin in their urine (microalbuminuria) have an increased risk of developing progressive kidney failure and cardiovascular disease in the future. Microalbumin measurements can be obtained using urine collected over a 24-hour period, for a specified amount of time (e.g., 4 hours or overnight), or randomly (spot).

- Related Tests: tests: Albumin; Creatinine; U_ACR; U_MIC_ALB

- Approximate Reference Range: Normal $<=$ 30 mg/24 hours; or 20 – 199 mcg/min (timed urine collection)

- Comments: The National Kidney Foundation recommends that diabetics between 12 and 70 years of age have a urine microalbumin test annually. If microalbuminuria is detected, it should be confirmed by retesting and, if positive on 2 of 3 determinations over a 3-6 month period, it is considered to be present and appropriate treatment is advised.

- Test Method Variance:

- Other:

  - Associated LOINC: 21059-1, 30003-8 , 53530-2
  - Associated CPT: 82043

1.1.62 U_PCR (Protein to creatinine ratio in urine)

- Common Name: Urine Protein to Creatinine Ratio (UPCR)

- Long Name: Protein to creatinine ratio in urine
- Test Type: U_PCR
- Panels: N/A
- Equivalent Tests: N/A
- Not Equivalent Tests: 24-Hour Urine Protein; Total Urine Protein
- Indications: To evaluate and monitor kidney function, and to detect kidney damage
- Description: Protein is not normally found in the urine, and urine protein tests detect and/or measure protein being excreted in the urine. U_PCR is one of several different urine protein tests, and involves the amount of protein in a random urine sample measured along with urine creatinine and reported as the ratio of urine protein to creatinine. Creatinine, a byproduct of muscle metabolism, is normally excreted into the urine at a constant rate. When both a urine creatinine and a random urine protein test are performed, the resulting U_PCR approaches the accuracy of the 24-hour urine protein test. Since saving all of the urine for a 24-hour period can be cumbersome for adults and difficult for infants and children, U_PCR may be substituted for a 24-hour urine protein sample.

U_PCR is used when a child shows evidence of significant and persistent protein in their urine with the dipstick urine test. It is also utilized to monitor kidney function over time on a patient with known kidney disease or damage. A U_CPR may used as a screen for kidney involvement when a patient is taking a medication that may potentially affect kidney function.

- Related Tests: Urinalysis; Albumin; Microalbumin; Protein Electrophoresis; Total Protein; ACR
- Approximate Reference Range: zero to trace
- Comments: The protein to creatinine ratio is more of a snapshot of how much protein is in the urine at the time the sample is collected. Children, and sometimes adults, occasionally have some degree of transient proteinuria without apparent kidney dysfunction and may have a higher excretion of protein into their urine during the day than at night. Monitoring by U_PCR at intervals is conducted to determine if the amount of proteinuria changes over time.

- Test Method Variance:
- Other:
  - Associated LOINC: 2890-2, 34366-5
  - Associated CPT:

1.1.63 U_PCR24 (24-hour Protein to creatinine ratio in urine)

NEEDS TO BE UPDATED

- Common Name: 24 hour Urine Protein to Creatinine Ratio
- Long Name: 24 hour Protein to creatinine ratio in urine
- Test Type: U_PCR24
- Panels: N/A
- Equivalent Tests: N/A
- Not Equivalent Tests:
- Indications: To evaluate and monitor kidney function, and to detect kidney damage
- Description: Protein is not normally found in the urine, and urine protein tests detect and/or measure protein being excreted in the urine. U_PCR is one of several different urine protein tests, and involves the amount of protein in a random urine sample measured along with urine creatinine and reported as the ratio of urine protein to creatinine. Creatinine, a byproduct of muscle metabolism, is normally excreted into the urine at a constant rate. When both a urine creatinine and a random urine protein test are performed, the resulting U_PCR approaches the accuracy of the 24-hour urine protein test. Since saving all of the urine for a 24-hour period can be cumbersome for adults and difficult for infants and children, U_PCR may be substituted for a 24-hour urine protein sample. U_PCR is used when a child shows evidence of significant and persistent protein in their urine with the dipstick urine test. It is also utilized to monitor kidney function over time on a patient with known kidney disease or damage. A U_CPR may used as a screen for kidney involvement when a patient is taking a medication that may potentially affect kidney function.

- Related Tests: Urinalysis; Albumin; Microalbumin; Protein Electrophoresis; Total Protein; ACR
- Approximate Reference Range: zero to trace
- Comments: The protein to creatinine ratio is more of a snapshot of how much protein is in the urine at the time the sample is collected. Children, and sometimes adults, occasionally have some degree of transient proteinuria without apparent kidney dysfunction and may have a higher excretion of protein into their urine during the day than at night. Monitoring by U_PCR at intervals is conducted to determine if the amount of proteinuria changes over time.
- Test Method Variance:
- Other:
  - Associated LOINC: 13801-6, 40486-3
  - Associated CPT:

1.1.64 (U_PROT) Protein to Creatinine Ratio in Urine Test Types

1. U_PROT (Protein in urine; total protein in urine)
   - Common Name: Urine Protein
   - Long Name: Protein in urine; total protein in urine
   - Test Type: U_PROT
   - Panels: N/A
   - Equivalent Tests: This TEST_TYPE should only be used for spot or random urine protein determinations.
   - Not Equivalent Tests: 24-Hour Urine Protein; Urine Protein to Creatinine Ratio; U_PCR
   - Indications: To detect excessive protein escaping into the urine (proteinuria), to assist in evaluating and monitoring kidney function, and to detect kidney damage. In diagnosing the cause of proteinuria, a serum protein electrophoresis may also be ordered to analyze the proteins in the blood.

- Description: Protein is not normally found in the urine, and urine protein tests detect and/or measure protein being excreted in the urine. When the kidneys are functioning normally, they retain or reabsorb filtered proteins and return them to the blood. However, if the kidneys are damaged, they become less effective at filtering, and detectible amounts of protein begin to find their way into the urine. Often, it is the smaller albumin molecules that are detected first. If the damage continues, the amount of protein in the urine increases, and globulins may also begin to be lost. Proteinuria is frequently seen in chronic diseases, such as diabetes and hypertension, with increasing amounts of protein in the urine reflecting increasing kidney damage. With early kidney damage, the patient is often asymptomatic. As damage progresses, or if protein loss is severe, the patient may have symptoms such as edema, shortness of breath, nausea, and fatigue. Excess protein production, such as may be seen with multiple myeloma, can also lead to proteinuria. The presence of albumin in the urine is a sensitive indicator of kidney disease in patients with diabetes and with hypertension. Therefore, in some situations the doctor may test specifically for albumin in the urine, as opposed to total urine protein.
- Related Tests: Urinalysis; Albumin; Microalbumin; Protein Electrophoresis; Total Protein; U_PCR
- Approximate Reference Range: <8mg/dL
- Comments:
- Test Method Variance:
- Other:
  - Associated LOINC: 21482-5, 2888-6, 32551-4, 35663-4
  - Associated CPT: 84156, 84160

2. U_PROT_24 (24-hour urine protein; total protein in urine)

- Common Name: 24-Hour Urine Protein
- Long Name: 24-hour urine protein; total protein in urine
- Test Type: U_PROT_24
- Panels: N/A
- Equivalent Tests: This TEST_TYPE should only be used for 24-hour urine collections for protein determinations.

- Not Equivalent Tests: Urine Total Protein; U_PCR; U_PROT
- Indications: To detect excessive protein escaping into the urine, to help evaluate and monitor kidney function, and to detect kidney damage. Since the dipstick protein test primarily measures albumin, a follow-up 24-hour urine protein test may be used to determine if proteins other than albumin are being released.
- Description: Protein is not normally found in the urine, and urine protein tests detect and/or measure protein being excreted in the urine. The quantity of protein in a 24-hour urine sample will be measured and reported as the amount of protein excreted per 24 hours. Proteinuria is frequently seen in chronic diseases, such as diabetes and hypertension, with increasing amounts of protein in the urine reflecting increasing kidney damage. With early kidney damage, the patient is often asymptomatic. As damage progresses, or if protein loss is severe, the patient may have symptoms such as edema, shortness of breath, nausea, and fatigue. Excess protein production, such as may be seen with multiple myeloma, can also lead to proteinuria. Either a 24-hour urine protein may be used to monitor a patient with known kidney disease or damage.
- Related Tests: Urinalysis; Albumin; Microalbumin; Protein Electrophoresis; Total Protein; U_PCR; U_PROT
- Approximate Reference Range: $<$ 150mg/day (in healthy individuals)
- Comments: A 24-hour urine sample gives the protein excretion rate over 24 hours and is accurate only if all of the urine is collected.
- Test Method Variance:
- Other:
  - Associated LOINC: 2889-4
  - Associated CPT: 81060

3. U_PROT_DIP (Protein in Urine by Dipstick, qualitative)

- Common Name: Urine Protein Dipstick
- Long Name: Protein in Urine by Dipstick, qualitative
- Test Type: U_PROT_DIP

- Panels: N/A
- Equivalent Tests: N/A
- Not Equivalent Tests: 24-Hour Urine Protein; U_PCR; ACR
- Indications: To detect excessive protein escaping into the urine, to help evaluate and monitor kidney function, and to detect kidney damage.
- Description: Protein is not normally found in the urine, and urine protein dipstick test detects protein being excreted in the urine. A protein "dipstick" may be performed as part of a urinalysis, generally on a random urine sample. A dipstick urine protein is measured frequently as a screening test, when a urinalysis is performed. This may be done as part of a routine physical, a pregnancy workup, when a urinary tract infection is suspected, as part of a hospital admission, or when evaluating kidney function. It may also be done when a previous dipstick has been positive for protein to see if the protein excretion persists. Since the dipstick primarily measures albumin, a follow-up 24-hour urine protein test may be ordered to determine if proteins other than albumin are being released. A dipstick urine protein on a random urine sample may be used as a screen for kidney involvement when a patient is taking a medication that may potentially affect kidney function. Proteinuria is frequently seen in chronic diseases, such as diabetes and hypertension, with increasing amounts of protein in the urine reflecting increasing kidney damage. With early kidney damage, the patient is often asymptomatic. As damage progresses, or if protein loss is severe, the patient may have symptoms such as edema, shortness of breath, nausea, and fatigue. Excess protein production, such as may be seen with multiple myeloma, can also lead to proteinuria.
- Related Tests: Urinalysis; Albumin; Microalbumin; Protein Electrophoresis; Total Protein
- Approximate Reference Range: zero to trace
- Comments: A positive dipstick protein may be elevated due to other sources of protein, such as blood, semen, or vaginal secretions in the urine. Since it measures primarily albumin, the dipstick may occasionally be normal when significant quantities of other proteins are present in the urine. Children, and sometimes adults, occasionally have some degree of transient protein-

uria without apparent kidney dysfunction and may have a higher excretion of protein into their urine during the day than at night.

- Test Method Variance:
- Other:
  - Associated LOINC: 20454-5, 27298-9, 2887-8, 32209-9, 50561-0, 50949-7, 53525-2 ,57735-3, 5804-0
  - Associated CPT: 81000

1.1.65 U_RBC_DIP (Erythrocytes [red blood cells] in urine by dipstick)

NEEDS TO BE UPDATED

1.1.66 URIC_ACID (Urate or Uric Acid in serum or plasma)

- Common Name: Uric acid
- Long Name: Urate; Uric acid in serum or plasma
- Test Type: URIC_ACID
- Panels: Arthritis panel, Bone and Joint panel
- Equivalent Tests: N/A
- Not Equivalent Tests: Urine uric acid concentration
- Indications: Physicians can use a serum uric acid test to determine if a patient has gout and to assess the effectiveness of its treatment. It is also used with other electrolyte tests to determine if oncology patients have tumor lysis syndrome during their chemotherapy regimen.
- Description: Uric acid is the metabolic end-product of purines. High serum uric acid levels can be the result of decreased kidney function, acidic urine, a diet high in purine-containing foods, or use of chemotherapy drugs.
- Related Tests: Urine uric acid concentration, serum potassium, serum calcium, serum phosphate
- Approximate Reference Range: Males: 2.5 - 8 mg/dL or 150 - 480 micromol/L; females: 1.5 - 6 mg/dL or 90 - 360 micromol/L

- Comments: In gouty arthritis, uric acid may not be properly cleared from the body and can deposit crystals into the joints and kidneys. High uric acid levels can also be due to increased consumption of purine rich foods, such as meats and yeast, as well as some fishes, beans, and vegetables. When oncology patients are using certain chemotherapy drugs, the increased amount of cell death can increase purine degradation from DNA therefore increasing uric acid levels. In the diagnosis of tumor lysis syndrome, serum uric acid levels are increased in addition to serum potassium and phosphate levels while serum calcium levels are lowered.
- Test Method Variance:
- Other:
  - Associated LOINC: 14933-6 , 3084-1, 35232-8, 98981-4
  - Associated CPT: 84550

1.1.67 VIT_B12 (Vitamin B12; Cobalamin)

- Common Name: Vitamin B12
- Long Name: Cyanocobalamin; Vitamin B12; cobalamin
- Test Type: VIT_B12
- Panels: N/A
- Equivalent Tests: N/A
- Not Equivalent Tests: N/A
- Indications: Physicians will order this test if they suspect vitamin B12 deficiency, megaloblastic anemia, pernicious anemia, or neuropathy (nerve damage). It can also be used to evaluate nutritional status and to monitor the effectiveness of treatment for B12 or folate deficiency.
- Description: Serum vitamin B12 evaluation is used to determine whether a patient has a deficiency of vitamin B12, usually as a result of inadequate dietary intake or decreased absorption. Vitamin B12 is highly protein bound in the bloodstream, with 70% of vitamin B12 bound to

transcobalamin I (not physiologically active), and 30% to transcobalamin II (physiologically active). Vitamin B12 is necessary for generating DNA, neurotransmitters, and for metabolizing homocysteine.

- Related Tests: methylmalonic acid (MMA), homocysteine, folate (folic acid)
- Approximate Reference Range: 140–820 pg/mL; 100–600 pmol/L
- Comments: All vitamin B12 comes from animal-based foods such as meats, eggs, and dairy products. Intrinsic factor is necessary for the absorption of oral vitamin B12 and may also lead to vitamin B12 deficiency if it is not properly secreted from the gastric mucosa. B12 and folate are primarily ordered to help diagnose the cause of macrocytic anemia. They are ordered as followup tests when large RBCs and a decreased hemoglobin concentration are found during a complete blood count (CBC) test. B12 may be ordered with folate, by itself, or with other screening laboratory tests – such as a comprehensive metabolic panel – to help diagnose the cause of neuropathy. High levels of B12 and folate are not usually clinically monitored. Increased B12 may be seen in conditions such as leukemia or liver dysfunction.
- Test Method Variance:
- Other:
  - Associated LOINC: 14685-2, 16695-9, 2132-9, 26916-7, 35201-3
  - Associated CPT: 82607

1.1.68 VIT_D_250H (Vitamin D; 25-hydroxy-vitamin D)

- Common Name: Vitamin D
- Long Name: Vitamin D (25 Hydroxy); 25-OH vitamin D; Calcidiol; 25-hydroxycholecalciferol
- Test Type: VIT_D_25OH
- Panels: Osteoporosis panel
- Equivalent Tests: N/A
- Not Equivalent Tests: 1,25 – dihydroxy-vitamin D

- Indications: 25-hydroxy-vitamin D testing is most commonly used to determine vitamin D deficiency. It is also indicated in hypocalcemic disorders associated with increased parathyroid hormone (PTH) levels, in children and adults with rickets, in adults with osteomalacia, and in vitamin D toxicity.
- Description: 25-hydroxy-cholecalciferol is generated in the liver by hydroxylation of cholecalciferol. Cholecalciferol is synthesized in the epidermis after exposure to UV radiation (sunlight). This value is used to determine a patient's vitamin D status.
- Related Tests: Serum calcium; PTH; Serum phosphorus
- Approximate Reference Range: 10 – 100 ng/mL; preferred range is $>$ 30 ng/mL since most laboratories consider 10-20 ng/mL to be insufficient
- Comments: The function of vitamin D is to help maintain appropriate serum calcium levels via absorption and distribution. Vitamin D toxicity is usually presented with hypercalcemia, hyperphosphatemia, soft tissue calcification, and renal failure.
- Test Method Variance:
- Other:
  - Associated LOINC: 14635-7, 1989-3, 35196-5, 95594-8
  - Associated CPT: 82306

1.2 Hematology and Coagulation

1.2.1 ANC (Absolute neutrophil count)

NEEDS TO BE UPDATED

1.2.2 (BASO) Basophil Test Types

1. BASO_C_A (Basophil number, automated count) ***NEEDS TO BE UPDATED***
2. BASO_C_M (Basophil number, manual count) ***NEEDS TO BE UPDATED***

3. BASO_C (Basophil number, count method not stated) ***NEEDS TO BE UPDATED***
4. BASO_P_A (Basophil percent, automated) ***NEEDS TO BE UPDATED***
5. BASO_P_M (Basophil number, manual) ***NEEDS TO BE UPDATED***
6. BASO_P (Basophil number, method not stated) ***NEEDS TO BE UPDATED***

1.2.3 (EOS) Eosinophil Test Types

1. EOS_C_A (Eosinophil number, automated count) ***NEEDS TO BE UPDATED***
2. EOS_C_M (Eosinophil number, manual count) ***NEEDS TO BE UPDATED***
3. EOS_C (Eosinophil number, count method not stated) ***NEEDS TO BE UPDATED***
4. EOS_P_A (Eosinophil percent, automated) ***NEEDS TO BE UPDATED***
5. EOS_P_M (Eosinophil percent, manual) ***NEEDS TO BE UPDATED***
6. EOS_P (Eosinophil percent, method not stated) ***NEEDS TO BE UPDATED***

1.2.4 FERRITIN (Ferritin in blood)

- Common Name: Ferritin
- Long Name: Ferritin in blood, serum, or plasma
- Test Type: FERRITIN
- Panels: Iron Panel
- Equivalent Tests: None
- Not Equivalent Tests: Serum iron

- Indications: Ferritin testing is often used in detecting iron deficiency anemia or iron overload.
- Description: Ferritin is a globular protein complex that plays a significant role in the absorption, storage, and release of iron for the body. The amount of ferritin reflects the amount of iron stored as a soluble and non-toxic form to buffer against iron deficiency and iron overload.
- Related Tests: Serum iron, transferrin, total iron-binding capacity
- Approximate Reference Range: Males: 30-300 mcg/L; Females: 10-200 mcg/L
- Comments: A low serum ferritin value is thought to be the best laboratory indicator of iron depletion (iron deficiency). Ferritin levels are elevated in those with hemochromatosis and other excess iron storage disorders and in those who have had multiple blood transfusions. Ferritin is an acute phase reactant, therefore serum ferritin concentrations can be increased by chronic infections, fever, and inflammatory reactions. The ferritin test may be ordered, along with other iron tests, when a complete blood count (CBC) shows that a person's hemoglobin and hematocrit are low and their red blood cells are smaller and paler than normal (i.e., potentially iron deficiency anemia).
- Test Method Variance: Results can also be reported as ng/mL
- Other:

1.2.5 FIBRINOGEN (Fibrinogen activity in platelet poor plasma)

NEEDS TO BE UPDATED

1.2.6 HGB (Hemoglobin)

- Common Name: Hemoglobin; Hgb; Hb
- Long Name: Hemoglobin
- Test Type: HGB
- Panels: Complete blood count
- Equivalent Tests: –

- Not Equivalent Tests: Red blood cell count (RBC); hematocrit (HCT); hemoglobin A1C (HGBA1C)
- Indications: To assess whether either anemia or polycythemia is present, and if so, to assess the severity of the condition. Also, hemoglobin is used to monitor response to treatment and to make decisions about the need for, and effectiveness of, transfusions.
- Description: Hemoglobin is a protein found in red blood cells. The amount of hemoglobin in the blood is an indication of the ability of the blood to deliver oxygen to organs and tissues and to transport carbon dioxide to the lungs.
- Related Tests: One component of the complete blood count (CBC) is hemoglobin. (Other components of the CBC include hematocrit, red blood cells, platelets, and white blood cells).
- Approximate Reference Range (Each site will have slight variations): 12 to 16 or 18 g/dL (12 to 18 g/100 milliliters or 12 to 18 grams/dL) among normal adults. There are separate age related reference ranges for males and female. The ranges are higher in newborns than in adults and children have slightly lower normal ranges.
- Comments: Hemoglobin increases when the number of red blood cells increases. Hemoglobin falls when production of red blood cells decreases, when there is increased destruction of red blood cells, or when there is significant bleeding. Elevated hemoglobin concentrations can be seen with dehydration, excess production of red blood cells by the bone marrow, severe lung disease, and other conditions. Low hemoglobin (anemia) can be the result of conditions such as iron, B12, or folate deficiency, inherited hemoglobin defects (e.g., sickle cell anemia or thalassemia), other inherited conditions, cirrhosis of the liver, bleeding, red cell destruction, kidney disease, aplastic anemia, other chronic illnesses, and certain cancers. Heavy smokers have higher hemoglobin levels than nonsmokers. Hemoglobin values are higher among those who live in high altitudes because the body produces more red blood cells in response to the decreased oxygen available at high altitude.
- Test Method Variance:
- Other:

  - Associated LOINC: 14775-1 (arterial; oximetry), 20509-6, 24360-0, 30313-1 (arterial), 30350-3, 30351-1, 30352-9 (capillary), 55782-7, 59260-0, 718-7
  - Associated CPT: 85018, 83026

1.2.7 HCT (Hematocrit)

- Common Name: Hematocrit, Hct, Crit;
- Long Name: Hematocrit
- Test Type: HCT
- Panels: Complete blood count
- Equivalent Tests: Packed cell volume (PCV)
- Not Equivalent Tests: Hemoglobin (HBG); red blood cell count (RBC); mean corpuscular

volume (MCV)

- Indications: To assess whether anemia, polycythemia, or dehydration is present. To assess response to treatment of anemia or polycythemia. To make decisions about need for transfusion and assess effectiveness of transfusions.
- Description: The hematocrit is a measurement of the proportion of blood that is made up of red blood cells. The value is expressed as a percentage (fraction, proportion) of cells in blood. For example, a hematocrit of 36% means that there are 36 milliliters of red blood cells in 100 milliliters of blood.
- Related Tests: HGB; red blood cells; MCV; One component of the complete blood count (CBC) is hematocrit. (Other components of the CBC include hemoglobin, red blood cells, platelets, and white blood cells).
- Approximate Reference Range (Each site will have slight variations): 36% to 48% (usually a higher reference range for higher altitudes)
- Comments: The hematocrit rises when the number of red blood cells increases or when the plasma volume is reduced such as with dehydration. Elevated hematocrit can also indicate polycythemia vera. The

hematocrit falls when the body decreases its production of red blood cells, increases destruction of red blood cells, or when there is blood loss (e.g., with bleeding). Decreased hematocrit indicates anemia. The hematocrit reflects both the number and the volume of red blood cells. Hematocrit values are higher among those who live in high altitudes because of an increase in the number of red blood cells (i.e., the body produces more red blood cells in response to the decreased oxygen available at high altitude). See also the comments for the related test hemoglobin.

- Test Method Variance: –
- Other: –

1.2.8 INR (International Normalization Ratio)

- Common Name: INR
- Long Name: International Normalization Ratio
- Test Type: INR
- Panels: –
- Equivalent Tests: –
- Not Equivalent Tests: Prothrombin time [PT]; activated clotting time [ACT]; partial thromboplastin time [PTT]
- Indications: To monitor the effectiveness of anti-coagulants such as warfarin which are prescribed to prevent the formation of blood clots.
- Description: The INR was created to standardize PT readings which vary from lab to lab. It is calculated by taking the PT ratio and exponeniating it by the international sensitivity index of the thromboplastin used to measure PT.
- Related Tests: PT; ACT; PTT; platelet count, platelet function test
- Approximate Reference Range: The goal of therapy for most patients is an INR of 2.0 to 3.0. The goal INR for some patients with a high risk of clot formation is 2.5 to 3.5.

- Comments: Patients' warfarin therapy must be titrated to reach these therapeutic ranges. Therefore, INR values may vary from higher or lower than the recommended ranges as

regimens are being titrated or adjusted. The risk of bleeding increases as INR increases.

- Test Method Variance: –
- Other: –

1.2.9 (LYMPH) Lymphocyte Test Types

1. LYMPH_C_A (Lymphocyte number, automated count) ***NEEDS TO BE UPDATED***
2. LYMPH_C_M (Lymphocyte number, manual count) ***NEEDS TO BE UPDATED***
3. LYMPH_C (Lymphocyte number, count method unknown) ***NEEDS TO BE UPDATED***
4. LYMPH_P_A (Lymphocyte percent, automated) ***NEEDS TO BE UPDATED***
5. LYMPH_P_M (Lymphocyte percent, manual) ***NEEDS TO BE UPDATED***
6. LYMPH_P (Lymphocyte percent, method unknown) ***NEEDS TO BE UPDATED***

1.2.10 (MONO) Monocyte Test Types

1. MONO_C_A (Monocyte number, automated count) ***NEEDS TO BE UPDATED***
2. MONO_C_M (Monocyte number, manual count) ***NEEDS TO BE UPDATED***
3. MONO_C (Monocyte number, count method unknown) ***NEEDS TO BE UPDATED***
4. MONO_P_A (Monocyte percent, automated) ***NEEDS TO BE UPDATED***

5. MONO_P_M (Monocyte percent, manual) ***NEEDS TO BE UPDATED***

6. MONO_P (Monocyte percent, method unknown) ***NEEDS TO BE UPDATED***

1.2.11 (NTBAND) Band Neutrophil Test Types

1. NTBAND_C_A (Band neutrophil number, automated count) ***NEEDS TO BE UPDATED***

2. NTBAND_C_M (Band neutrophil number, manual count) ***NEEDS TO BE UPDATED***

3. NTBAND_C (Band neutrophil number, count method unknown) ***NEEDS TO BE UPDATED***

4. NTBAND_P_A (Band neutrophil percent, automated) ***NEEDS TO BE UPDATED***

5. NTBAND_P_M (Band neutrophil percent, manual) ***NEEDS TO BE UPDATED***

6. NTBAND_P (Band neutrophil percent, method unknown) ***NEEDS TO BE UPDATED***

1.2.12 (NTHYP) Hypersegmented Neutrophil Test Types

1. NTHYP_C_A (Hypersegmented neutrophil number, automated count) ***NEEDS TO BE UPDATED***

2. NTHYP_C_M (Hypersegmented neutrophil number, manual count) ***NEEDS TO BE UPDATED***

3. NTHYP_C (Hypersegmented neutrophil number, count method unknown) ***NEEDS TO BE UPDATED***

4. NTHYP_P_A (Hypersegmented neutrophil percent, automated) ***NEEDS TO BE UPDATED***

5. NTHYP_P_M (Hypersegmented neutrophil percent, manual) ***NEEDS TO BE UPDATED***

6. NTHYP_P (Hypersegmented neutrophil percent, method unknown) ***NEEDS TO BE UPDATED***

1.2.13 (NTIMMATURE) Immature Neutrophil Test Types

1. NTIMMATURE_C_A (Immature neutrophil number, automated count) ***NEEDS TO BE UPDATED***
2. NTIMMATURE_C_M (Immature neutrophil number, manual count) ***NEEDS TO BE UPDATED***
3. NTIMMATURE_C (Immature neutrophil number, count method unknown) ***NEEDS TO BE UPDATED***
4. NTIMMATURE_P_A (Immature neutrophil percent, automated) ***NEEDS TO BE UPDATED***
5. NTIMMATURE_P_M (Immature neutrophil percent, manual) ***NEEDS TO BE UPDATED***
6. NTIMMATURE_P (Immature neutrophil percent, method unknown) ***NEEDS TO BE UPDATED***

1.2.14 (NTSEG) Segmented Neutrophil Test Types

1. NTSEG_C_A (Segmented neutrophil number, automated count) ***NEEDS TO BE UPDATED***
2. NTSEG_C_M (Segmented neutrophil number, manual count) ***NEEDS TO BE UPDATED***
3. NTSEG_C (Segmented neutrophil number, count method unknown) ***NEEDS TO BE UPDATED***
4. NTSEG_P_A (Segmented neutrophil percent, automated) ***NEEDS TO BE UPDATED***
5. NTSEG_P_M (Segmented neutrophil percent, manual) ***NEEDS TO BE UPDATED***
6. NTSEG_P (Segmented neutrophil percent, method unknown) ***NEEDS TO BE UPDATED***

1.2.15 PLATELETS (Platelet count in blood)

- Common Name: Platelet count; thrombocyte count; PLT
- Long Name: Platelets

- Test Type: PLATELETS
- Panels: Complete blood count
- Equivalent Tests: –
- Not Equivalent Tests: Platelet aggregation; other tests of platelet function
- Indications: Platelet counts are used to diagnose bleeding disorders and diseases of the bone marrow. Platelet counts are ordered when an individual has unexplained bruising. Platelet counts are also used when an individual seems to take an excessive amount of time to stop bleeding from cuts and wounds that are not large.
- Description: The platelet count is used to determine the number of platelets in your blood. Platelets, also known as thrombocytes, are small pieces of larger cells known as megakarycytes. Megakarycytes are made in the bone marrow. Platelets are released from the bone marrow and circulate in the blood. Platelets are the "first responders" when there is injury to a tissue or blood vessel. Platelets begin the formation of a blood clot in response to injury.
- Related Tests: Platelet aggregation; One component of the complete blood count (CBC) is platelets. (Other components of the CBC include hemoglobin, red blood cells, hematocrit, and white blood cells).
- Approximate Reference Range (Each site will have slight variations): 150,000 to 450,000 per microliter (mcl or L or 10-6/Liter) of blood.
- Comments: Platelet counts are used to help diagnose bleeding disorders and bone marrow diseases such as leukemia. Other causes of low platelets include autoimmune diseases, drug reactions, chemotherapy, diseases such as thrombocytopenic purpura (TTP), heparin induced thrombocytopenia, hemolytic uremia syndrome, and pooling of platelets in the spleen. When platelet counts fall below 10,000 – 20,000 per microliter, bleeding can occur even in the absence of apparent injury. Very low platelet counts are called thrombocytopenia. Platelet counts can also be too high (aka thrombocytosis). Thrombocytosis sometimes occurs without any other medical condition or with myeloproliferative disorders. The platelets in individuals with myeloproliferative disorders often do not function normally.

- Test Method Variance: –
- Other: –

1.2.16 PT (Prothrombin time)

- Common Name: PT; Prothrombin Time; Pro Time; Protime
- Long Name: Prothrombin time
- Test Type: PT
- Panels: Coagulation
- Equivalent Tests: –
- Not Equivalent Tests: International normalization ratio [INR]; activated clotting time [ACT]; partial thromboplastin time [PTT]; thrombin time, prothrombin factor assay (factor 2), prothrombin gene polymorphism, i.e., prothrombin 20210A
- Indications: There are several indications for measuring PT. It can be used to: monitor coagulation for patients on blood thinners; assess bleeding disorders/screening for coagulopathies in patients not on blood thinners; assure normal clotting ability among patients undergoing surgery; and assess liver function.
- Description: The prothrombin time test measures how long it takes for blood to clot. More specifically it measures the time it takes for the clotting factor prothrombin to be converted to thrombin. Clotting factors in the intrinsic and extrinsic coagulation pathways impact prothrombin time. If either factors I (fibrinogen), II (prothrombin), V, VII, or X are missing, deficient, or defective, clotting time may be delayed.
- Related Tests: INR; ACT; PTT; platelet count, platelet function test
- Approximate Reference Range: The unit of measurement is "seconds." Each site will have slight variations due to the reagent and instrumentation used.
- Comments: A PT of 20 seconds in one lab may not represent the same degree of anticoagulation as a PT of 20 seconds in another lab. Because of the variation in PT reporting, the INR was created to adjust for the sensitivity of the thromboplastin reagent used to measure PT.

- Test Method Variance: The test results depend on the method used. .
- Other: –

1.2.17 PTT (activated Partial throomboplastin time)

- Common Name: PT; Prothrombin Time; Pro Time; Protime
- Long Name: Prothrombin time
- Test Type: PT
- Panels: Coagulation
- Equivalent Tests: –
- Not Equivalent Tests: International normalization ratio [INR]; activated clotting time [ACT]; partial thromboplastin time [PTT]; thrombin time, prothrombin factor assay (factor 2), prothrombin gene polymorphism, i.e., prothrombin 20210A
- Indications: There are several indications for measuring PT. It can be used to: monitor coagulation for patients on blood thinners; assess bleeding disorders/screening for coagulopathies in patients not on blood thinners; assure normal clotting ability among patients undergoing surgery; and assess liver function.
- Description: The prothrombin time test measures how long it takes for blood to clot. More specifically it measures the time it takes for the clotting factor prothrombin to be converted to thrombin. Clotting factors in the intrinsic and extrinsic coagulation pathways impact prothrombin time. If either factors I (fibrinogen), II (prothrombin), V, VII, or X are missing, deficient, or defective, clotting time may be delayed.
- Related Tests: INR; ACT; PTT; platelet count, platelet function test
- Approximate Reference Range: The unit of measurement is "seconds." Each site will have slight variations due to the reagent and instrumentation used.
- Comments: A PT of 20 seconds in one lab may not represent the same degree of anticoagulation as a PT of 20 seconds in another lab. Because of the variation in PT reporting, the INR was created to adjust for the sensitivity of the thromboplastin reagent used to measure PT.

- Test Method Variance: The test results depend on the method used. .
- Other: –

1.2.18 RBC (Red Blood Cell Count [in blood])

- Common Name: Red blood cell count; RBC count; erythrocyte count; red count
- Long Name: Red blood cell count
- Test Type: RBC
- Panels: Complete blood count
- Equivalent Tests: –
- Not Equivalent Tests: Hemoglobin (HGB); hematocrit (HCT); mean corpuscular volume (MCV)
- Indications: To assess whether the number of RBCs in whole blood is within the normal range, and to aid in diagnosing hematologic disorders, bleeding problems, anemias, and polycythemia.
- Description: The RBC is used to evaluate the number of red blood cells in blood.
- Related Tests: Blood smear; complete blood count (CBC) (Other components of the CBC include hemoglobin, hematocrit, platelets, and white blood cells).
- Approximate Reference Range (Each site will have slight variations): Male: 4.7 – 6.1 million cells per microliter (mcl or L or 10-6/Liter) of blood; Female: 4.2 – 5.4 million cells per microliter (mcl or L or 10-6/Liter) of blood
- Comments: RBC counts must be interpreted along with HGB, HCT, and/or red blood cell indices (MCV, mean corpuscular hemoglobin concentration [MCHC], and mean corpuscular hemoglobin [MCH]). RBCs are made in the bone marrow and carry oxygen from the lungs to body cells and transport carbon dioxide from cells back to the lungs. Changes in RBC count are usually associated with changes in HGB levels. When the RBC falls below normal, anemia occurs. A decreased number of RBCs can result from blood loss. A slight decrease in RBC

is seen in pregnancy as a result of expansion of body fluids. Disorders such as RBC destruction (e.g., hemolytic anemia) or decreased RBC production (e.g., iron deficiency anemia) can result in low RBC counts. When RBC rises about normal, polycythemia occurs. Dehydration, congenital heart diseases, some pulmonary diseases, and tissue hypoxia over an extended period of time can result in increases in RBCs. RBC counts are higher among those who live in high altitudes because the body produces more red RBCs in response to decreased oxygen available at high altitude.

- Test Method Variance: –
- Other: –

1.2.19 (WBC) White Blood Cell Test Types

1. WBC (Total White Blood Cell Count)
    - Common Name: WBC count; Leukocyte count; White count
    - Long Name: Total white blood cell count
    - Test Type: WBC
    - Panels: Complete blood count
    - Equivalent Tests: –
    - Not Equivalent Tests: Tests of individual types of WBCs (neutrophils, lymphocytes, monocytes, eosinophils, or basophils).
    - Indications: To assist in determining the presence of an infection or a disease (e.g., leukemia) that affects the production of white blood cells; to monitor treatment and bone marrow function.
    - Description: The white blood cell (WBC) count is used to evaluate the number of white blood cells in blood. White blood cells are made in the bone marrow and protect the body against infection as well as aiding in the immune response. If there is an infection, white blood cells will attack and destroy the pathogen causing the infection.
    - Related Tests: Blood smear; tests of individual types of WBCs (neutrophils, lymphocytes, monocytes, eosinophils, or basophils). One component of the complete blood count (CBC); (Other components of the CBC include hemoglobin, red blood cells, hematocrit, and platelets).

- Approximate Reference Range (Each site will have slight variations): 4,500 – 10,000 WBCs per microliter (mcl or L or 10-6/Liter) of blood
- Comments: White blood cells are also called leukocytes. Conditions that inhibit WBC proliferation and/or weaken the immune system (e.g., HIV infection, chemotherapy) cause a decrease in the number of WBCs. An elevated number of WBCs is called leukocytosis. A decreased WBC count is called leukopenia. On average, infants have higher WBC counts than do adults. Some drugs and smoking can affect the WBC count.
- Test Method Variance: –
- Other: –

2. WBC_A (White Blood Cell, automated count) ***NEEDS TO BE UPDATED***

   - Common Name: WBC count; Leukocyte count; White count
   - Long Name: Total white blood cell count
   - Test Type: WBC
   - Panels: Complete blood count
   - Equivalent Tests: –
   - Not Equivalent Tests: Tests of individual types of WBCs (neutrophils, lymphocytes, monocytes, eosinophils, or basophils).
   - Indications: To assist in determining the presence of an infection or a disease (e.g., leukemia) that affects the production of white blood cells; to monitor treatment and bone marrow function.
   - Description: The white blood cell (WBC) count is used to evaluate the number of white blood cells in blood. White blood cells are made in the bone marrow and protect the body against infection as well as aiding in the immune response. If there is an infection, white blood cells will attack and destroy the pathogen causing the infection.
   - Related Tests: Blood smear; tests of individual types of WBCs (neutrophils, lymphocytes, monocytes, eosinophils, or basophils). One component of the complete blood count (CBC); (Other components of the CBC include hemoglobin, red blood cells, hematocrit, and platelets).

- Approximate Reference Range (Each site will have slight variations): 4,500 – 10,000 WBCs per microliter (mcl or L or 10-6/Liter) of blood
- Comments: White blood cells are also called leukocytes. Conditions that inhibit WBC proliferation and/or weaken the immune system (e.g., HIV infection, chemotherapy) cause a decrease in the number of WBCs. An elevated number of WBCs is called leukocytosis. A decreased WBC count is called leukopenia. On average, infants have higher WBC counts than do adults. Some drugs and smoking can affect the WBC count.
- Test Method Variance: –
- Other: –

3. WBC_COR (White blood cell total, corrected for nucleated red blood cells) ***NEEDS TO BE UPDATED***

    - Common Name: WBC count; Leukocyte count; White count
    - Long Name: Total white blood cell count
    - Test Type: WBC
    - Panels: Complete blood count
    - Equivalent Tests: –
    - Not Equivalent Tests: Tests of individual types of WBCs (neutrophils, lymphocytes, monocytes, eosinophils, or basophils).
    - Indications: To assist in determining the presence of an infection or a disease (e.g., leukemia) that affects the production of white blood cells; to monitor treatment and bone marrow function.
    - Description: The white blood cell (WBC) count is used to evaluate the number of white blood cells in blood. White blood cells are made in the bone marrow and protect the body against infection as well as aiding in the immune response. If there is an infection, white blood cells will attack and destroy the pathogen causing the infection.
    - Related Tests: Blood smear; tests of individual types of WBCs (neutrophils, lymphocytes, monocytes, eosinophils, or basophils). One component of the complete blood count (CBC); (Other components of the CBC include hemoglobin, red blood cells, hematocrit, and platelets).

- Approximate Reference Range (Each site will have slight variations): 4,500 – 10,000 WBCs per microliter (mcl or L or 10-6/Liter) of blood
- Comments: White blood cells are also called leukocytes. Conditions that inhibit WBC proliferation and/or weaken the immune system (e.g., HIV infection, chemotherapy) cause a decrease in the number of WBCs. An elevated number of WBCs is called leukocytosis. A decreased WBC count is called leukopenia. On average, infants have higher WBC counts than do adults. Some drugs and smoking can affect the WBC count.
- Test Method Variance: –
- Other: –

4. WBC_COR_A (White blood cell total, corrected for nucleated red blood cells) ***NEEDS TO BE UPDATED***

    - Common Name: WBC count; Leukocyte count; White count
    - Long Name: Total white blood cell count
    - Test Type: WBC
    - Panels: Complete blood count
    - Equivalent Tests: –
    - Not Equivalent Tests: Tests of individual types of WBCs (neutrophils, lymphocytes, monocytes, eosinophils, or basophils).
    - Indications: To assist in determining the presence of an infection or a disease (e.g., leukemia) that affects the production of white blood cells; to monitor treatment and bone marrow function.
    - Description: The white blood cell (WBC) count is used to evaluate the number of white blood cells in blood. White blood cells are made in the bone marrow and protect the body against infection as well as aiding in the immune response. If there is an infection, white blood cells will attack and destroy the pathogen causing the infection.
    - Related Tests: Blood smear; tests of individual types of WBCs (neutrophils, lymphocytes, monocytes, eosinophils, or basophils). One component of the complete blood count (CBC); (Other components of the CBC include hemoglobin, red blood cells, hematocrit, and platelets).

- Approximate Reference Range (Each site will have slight variations): 4,500 – 10,000 WBCs per microliter (mcl or L or 10-6/Liter) of blood
- Comments: White blood cells are also called leukocytes. Conditions that inhibit WBC proliferation and/or weaken the immune system (e.g., HIV infection, chemotherapy) cause a decrease in the number of WBCs. An elevated number of WBCs is called leukocytosis. A decreased WBC count is called leukopenia. On average, infants have higher WBC counts than do adults. Some drugs and smoking can affect the WBC count.
- Test Method Variance: –
- Other: –

5. WBC_M (White Blood Cell Count, manual count) ***NEEDS TO BE UPDATED***

    - Common Name: WBC count; Leukocyte count; White count
    - Long Name: Total white blood cell count
    - Test Type: WBC - Panels: Complete blood count
    - Equivalent Tests:
    - Not Equivalent Tests: Tests of individual types of WBCs (neutrophils, lymphocytes, monocytes, eosinophils, or basophils).
    - Indications: To assist in determining the presence of an infection or a disease (e.g., leukemia) that affects the production of white blood cells; to monitor treatment and bone marrow function.
    - Description: The white blood cell (WBC) count is used to evaluate the number of white blood cells in blood. White blood cells are made in the bone marrow and protect the body against infection as well as aiding in the immune response. If there is an infection, white blood cells will attack and destroy the pathogen causing the infection.
    - Related Tests: Blood smear; tests of individual types of WBCs (neutrophils, lymphocytes, monocytes, eosinophils, or basophils). One component of the complete blood count (CBC); (Other components of the CBC include hemoglobin, red blood cells, hematocrit, and platelets).

- Approximate Reference Range (Each site will have slight variations): 4,500 – 10,000 WBCs per microliter (mcl or L or 10-6/Liter) of blood
- Comments: White blood cells are also called leukocytes. Conditions that inhibit WBC proliferation and/or weaken the immune system (e.g., HIV infection, chemotherapy) cause a decrease in the number of WBCs. An elevated number of WBCs is called leukocytosis. A decreased WBC count is called leukopenia. On average, infants have higher WBC counts than do adults. Some drugs and smoking can affect the WBC count. Test

Method Variance:

- Other:

6. WBC_OTH_C (White blood cell other leukocytes, count) ***NEEDS TO BE UPDATED***

- Common Name: WBC count; Leukocyte count; White count
- Long Name: Total white blood cell count
- Test Type: WBC
- Panels: Complete blood count
- Equivalent Tests: –
- Not Equivalent Tests: Tests of individual types of WBCs (neutrophils, lymphocytes, monocytes, eosinophils, or basophils).
- Indications: To assist in determining the presence of an infection or a disease (e.g., leukemia) that affects the production of white blood cells; to monitor treatment and bone marrow function.
- Description: The white blood cell (WBC) count is used to evaluate the number of white blood cells in blood. White blood cells are made in the bone marrow and protect the body against infection as well as aiding in the immune response. If there is an infection, white blood cells will attack and destroy the pathogen causing the infection.
- Related Tests: Blood smear; tests of individual types of WBCs (neutrophils, lymphocytes, monocytes, eosinophils, or basophils). One component of the complete blood count (CBC); (Other components of the CBC include hemoglobin, red blood cells, hematocrit, and platelets).

- Approximate Reference Range (Each site will have slight variations): 4,500 – 10,000 WBCs per microliter (mcl or L or 10-6/Liter) of blood
- Comments: White blood cells are also called leukocytes. Conditions that inhibit WBC proliferation and/or weaken the immune system (e.g., HIV infection, chemotherapy) cause a decrease in the number of WBCs. An elevated number of WBCs is called leukocytosis. A decreased WBC count is called leukopenia. On average, infants have higher WBC counts than do adults. Some drugs and smoking can affect the WBC count.
- Test Method Variance: –
- Other: –

7. WBC_OTH_P (White blood cell other leukocytes, percent) ***NEEDS TO BE UPDATED***

    - Common Name: WBC count; Leukocyte count; White count
    - Long Name: Total white blood cell count
    - Test Type: WBC
    - Panels: Complete blood count
    - Equivalent Tests: –
    - Not Equivalent Tests: Tests of individual types of WBCs (neutrophils, lymphocytes, monocytes, eosinophils, or basophils).
    - Indications: To assist in determining the presence of an infection or a disease (e.g., leukemia) that affects the production of white blood cells; to monitor treatment and bone marrow function.
    - Description: The white blood cell (WBC) count is used to evaluate the number of white blood cells in blood. White blood cells are made in the bone marrow and protect the body against infection as well as aiding in the immune response. If there is an infection, white blood cells will attack and destroy the pathogen causing the infection.
    - Related Tests: Blood smear; tests of individual types of WBCs (neutrophils, lymphocytes, monocytes, eosinophils, or basophils). One component of the complete blood count (CBC); (Other components of the CBC include hemoglobin, red blood cells, hematocrit, and platelets).

- Approximate Reference Range (Each site will have slight variations): 4,500 – 10,000 WBCs per microliter (mcl or L or 10-6/Liter) of blood
- Comments: White blood cells are also called leukocytes. Conditions that inhibit WBC proliferation and/or weaken the immune system (e.g., HIV infection, chemotherapy) cause a decrease in the number of WBCs. An elevated number of WBCs is called leukocytosis. A decreased WBC count is called leukopenia. On average, infants have higher WBC counts than do adults. Some drugs and smoking can affect the WBC count.
- Test Method Variance: –
- Other: –

1.3 Influenza

1.3.1 INF_A_VTC (Influenza virus A organism-specific culture)

NEEDS TO BE UPDATED

1.3.2 INF_A_NS (Influenza virus A method not specified)

NEEDS TO BE UPDATED

1.3.3 INF_A_EIA (Influenza virus A immunoassay)

NEEDS TO BE UPDATED

1.3.4 INF_A_IF (Influenza virus A immunofluorescence)

NEEDS TO BE UPDATED

1.3.5 INF_A_PCR (Influenza virus A probe and target amplication)

NEEDS TO BE UPDATED

1.3.6 INF_B_VTC (Influenza virus B organism-specific culture)

NEEDS TO BE UPDATED

1.3.7 INF_B_NS (Influenza virus B method not specified)

NEEDS TO BE UPDATED

1.3.8 INF_B_EIA (Influenza virus B immunoassay)

NEEDS TO BE UPDATED

1.3.9 INF_B_IF (Influenza virus B immunofluorescence)

NEEDS TO BE UPDATED

1.3.10 INF_B_PCR (Influenza virus B probe and target amplication)

NEEDS TO BE UPDATED

1.3.11 INF_AB_NS (Influenza virus A+B method not specified)

NEEDS TO BE UPDATED

1.3.12 INF_AB_EIA (Influenza virus A+B immunoassay)

NEEDS TO BE UPDATED

1.3.13 INF_AB_IF (Influenza virus A+B immunofluorescence)

NEEDS TO BE UPDATED

1.3.14 INF_AB_PCR (Influenza virus A+B probe and target amplication)

NEEDS TO BE UPDATED

1.3.15 INF_NS_VTC (Influenza virus not specified organism-specific culture)

NEEDS TO BE UPDATED

1.3.16 INF_NS_NS (Influenza virus not specified method not specified)

NEEDS TO BE UPDATED

1.3.17 INF_NS_PCR (Influenza virus not specified probe and target amplification)

NEEDS TO BE UPDATED

1.4 COVID-19

1.4.1 SARS_COV_2_AB_IGA (SARS-CoV-2 (COVID19) IgA Ab [Presence] in Serum, Plasma or Blood by Immunoassay)

NEEDS TO BE UPDATED

1.4.2 SARS_COV_2_AB_IGG (SARS-CoV-2 (COVID19) IgG Ab [Presence] in Serum, Plasma or Blood by Immunoassay)

NEEDS TO BE UPDATED

1.4.3 SARS_COV_2_AB_IGM (SARS-CoV-2 (COVID19) IgM Ab [Presence] in Serum, Plasma or Blood by Immunoassay)

NEEDS TO BE UPDATED

1.4.4 SARS_COV_2_AB_IGMA (SARS-CoV-2 (COVID19) IgA+IgM [Presence] in Serum or Plasma by Immunoassay)

NEEDS TO BE UPDATED

1.4.5 SARS_COV_2_AB_IGMG (SARS-CoV-2 (COVID19) IgG+IgM Ab [Presence] in Serum or Plasma by Immunoassay)

NEEDS TO BE UPDATED

1.4.6 SARS_COV_2_AB_NEUT (SARS-CoV-2 (COVID19) neutralizing antibody in Serum or Plasma)

NEEDS TO BE UPDATED

1.4.7 SARS_COV_2_AB_NEUT_P (Percent neutralization by SARS-CoV-2 spike protein RBD neutralizing antibody-Serum/Plasma)

NEEDS TO BE UPDATED

1.4.8 SARS_COV_2_AB_NEUT_T (SARS-CoV-2 (COVID-19) S protein RBD neutralizing antibody [Titer] in Serum or Plasma by Immunoassay)

NEEDS TO BE UPDATED

1.4.9 SARS_COV_2_AB_TOT (SARS-CoV-2 (COVID19) Ab in Serum, Plasma or Saliva)

NEEDS TO BE UPDATED

1.4.10 SARS_COV_2_IA (SARS-CoV-2 (COVID19) Ag [Presence] in Respiratory specimen by Rapid immunoassay)

NEEDS TO BE UPDATED

1.4.11 SARS_COV_2_NS (SARS-CoV-2 (COVID19) unspecified or other specimen or method)

NEEDS TO BE UPDATED

1.4.12 SARS_COV_2_NAAT (SARS-CoV-2 (COVID19) (Nucleic Acid Amp Testing or gene presence in Resp, ser/plas or unspec specimen)

NEEDS TO BE UPDATED **SARS_COV_2_T_STIM (SARS_CoV-2 stimulated gamma interferon release by Helper CD4+ T-cells [Units/volume] by Immunoassay) */NEEDS TO BE UPDATED/

1.4.13 SARS_COV_2_VAR (SARS-CoV-2 (COVID-19) variant [Type] in Specimen)

NEEDS TO BE UPDATED

1.4.14 SARS_COV_2_VL (SARS-CoV-2 (COVID-19) N gene [#/volume] (viral load) in Resp specimen by NAA with probe detection)

NEEDS TO BE UPDATED

1.4.15 SARS_COV_2_VL_LOG (SARS-CoV-2 (COVID19) RNA [Log #/volume] (viral load) Unspecified specimen by NAA - probe detection)

NEEDS TO BE UPDATED

1.5 Opioid Urine Toxicity

1.5.1 Opiates from natural sources

1. U_CODEINE_CNF (Codeine in Urine by Confirmation) ***NEEDS TO BE UPDATED***

   - - Common Name: Codeine in Urine by Confirmatory method
   - Long Name:
   - Test Type:
   - Panels:
   - Equivalent Tests:
   - Not Equivalent Tests:
   - Indications:
   - Description:
   - Related Tests:
   - Approximate Reference Range (Each site will have slight variations):
   - Comments:

   For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.

   - - Test Method Variance:
   - Other:

2. U_CODEINE_SCR (Codeine in Urine by Screen) ***NEEDS TO BE UPDATED***

   - - Common Name: Codeine in Urine by Screen method

- Long Name:
- Test Type:
- Panels:
- Equivalent Tests:
- Not Equivalent Tests:
- Indications:
- Description:
- Related Tests:
- Approximate Reference Range (Each site will have slight variations):
- Comments:

For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.

- Test Method Variance:
- Other:

3. U_MORPHINE_CNF (Morphine in Urine by Confirmation) ***NEEDS TO BE UPDATED***

   - - Common Name: Codeine in Urine by Confirmatory method
   - Long Name:
   - Test Type:
   - Panels:
   - Equivalent Tests:
   - Not Equivalent Tests:
   - Indications:
   - Description:
   - Related Tests:
   - Approximate Reference Range (Each site will have slight variations):
   - Comments:

For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.

- Test Method Variance:
- Other:

4. U_MORPHINE_SCR (Morphine in Urine by Screen) ***NEEDS TO BE UPDATED***

   - - Common Name: Codeine in Urine by Screen method
   - Long Name:
   - Test Type:
   - Panels:
   - Equivalent Tests:
   - Not Equivalent Tests:
   - Indications:
   - Description:
   - Related Tests:
   - Approximate Reference Range (Each site will have slight variations):
   - Comments:

   For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.

   - Test Method Variance:
   - Other:

5. U_OPIATE_CNF (Opiate in Urine by Confirmation) ***NEEDS TO BE UPDATED***

   - - Common Name: Codeine in Urine by Confirmatory method
   - Long Name:

- Test Type:
- Panels:
- Equivalent Tests:
- Not Equivalent Tests:
- Indications:
- Description:
- Related Tests:
- Approximate Reference Range (Each site will have slight variations):
- Comments:

For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.

- Test Method Variance:
- Other:

6. U_OPIATE_SCR (Opiate in Urine by Screen) ***NEEDS TO BE UPDATED***

   - - Common Name: Codeine in Urine by Screen method
   - Long Name:
   - Test Type:
   - Panels:
   - Equivalent Tests:
   - Not Equivalent Tests:
   - Indications:
   - Description:
   - Related Tests:
   - Approximate Reference Range (Each site will have slight variations):
   - Comments:

For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.

- Test Method Variance:
- Other:

1.5.2 Semi-synthetic opioids

1. U_HYDROCODONE_CNF (Hydrocodone in Urine by Confirmation) ***NEEDS TO BE UPDATED***

   - - Common Name: Codeine in Urine by Confirmatory method
   - Long Name:
   - Test Type:
   - Panels:
   - Equivalent Tests:
   - Not Equivalent Tests:
   - Indications:
   - Description:
   - Related Tests:
   - Approximate Reference Range (Each site will have slight variations):
   - Comments:

   For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.

   - Test Method Variance:
   - Other:

2. U_HYDROCODONE_SCR (Hydrocodone in Urine by Screen) ***NEEDS TO BE UPDATED***

   - - Common Name: Codeine in Urine by Screen method

- Long Name:
- Test Type:
- Panels:
- Equivalent Tests:
- Not Equivalent Tests:
- Indications:
- Description:
- Related Tests:
- Approximate Reference Range (Each site will have slight variations):
- Comments:

For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.

- Test Method Variance:
- Other:

3. U_HYDROMORPHONE_CNF (Hydromorphone in Urine by Confirmation) ***NEEDS TO BE UPDATED***

    - Common Name: Codeine in Urine by Confirmatory method
    - Long Name:
    - Test Type:
    - Panels:
    - Equivalent Tests:
    - Not Equivalent Tests:
    - Indications:
    - Description:
    - Related Tests:
    - Approximate Reference Range (Each site will have slight variations):
    - Comments:

For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.

- Test Method Variance:
- Other:

4. U_HYDROMORPHONE_SCR (Hydromorphone in Urine by Screen) ***NEEDS TO BE UPDATED***

    - Common Name: Codeine in Urine by Screen method
    - Long Name:
    - Test Type:
    - Panels:
    - Equivalent Tests:
    - Not Equivalent Tests:
    - Indications:
    - Description:
    - Related Tests:
    - Approximate Reference Range (Each site will have slight variations):
    - Comments:

    For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.

    - Test Method Variance:
    - Other:

5. U_OXYCODONE_CNF (Oxycodone in Urine by Confirmation) ***NEEDS TO BE UPDATED***

    - Common Name: Codeine in Urine by Confirmatory method
    - Long Name:

- Test Type:
- Panels:
- Equivalent Tests:
- Not Equivalent Tests:
- Indications:
- Description:
- Related Tests:
- Approximate Reference Range (Each site will have slight variations):
- Comments:

For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.

- Test Method Variance:
- Other:

6. U_OXYCODONE_SCR (Oxycodone in Urine by Screen) ***NEEDS TO BE UPDATED***

    - Common Name: Codeine in Urine by Screen method
    - Long Name:
    - Test Type:
    - Panels:
    - Equivalent Tests:
    - Not Equivalent Tests:
    - Indications:
    - Description:
    - Related Tests:
    - Approximate Reference Range (Each site will have slight variations):
    - Comments:

For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.

- Test Method Variance:
- Other:

7. U_OXYMORPHONE_CNF (Oxymorphone in Urine by Confirmation) ***NEEDS TO BE UPDATED***

   - Common Name: Codeine in Urine by Confirmatory method
   - Long Name:
   - Test Type:
   - Panels:
   - Equivalent Tests:
   - Not Equivalent Tests:
   - Indications:
   - Description:
   - Related Tests:
   - Approximate Reference Range (Each site will have slight variations):
   - Comments:

   For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.

   - Test Method Variance:
   - Other:

8. U_OXYMORPHONE_SCR (Oxymorphone in Urine by Screen) ***NEEDS TO BE UPDATED***

   - Common Name: Codeine in Urine by Screen method
   - Long Name:

- Test Type:
- Panels:
- Equivalent Tests:
- Not Equivalent Tests:
- Indications:
- Description:
- Related Tests:
- Approximate Reference Range (Each site will have slight variations):
- Comments:

For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.

- Test Method Variance:
- Other:

1.5.3 Synthetic opioids

1. U_DIPIPANONE_CNF (Dipipanone in Urine by Confirmation)
    - Common Name: Dipipanone in Urine by Confirmatory method
    - Long Name:
    - Test Type:
    - Panels:
    - Equivalent Tests:
    - Not Equivalent Tests:
    - Indications:
    - Description:
    - Related Tests:
    - Approximate Reference Range (Each site will have slight variations):

- Comments: For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.
- Test Method Variance:
- Other:

2. U_DIPIPANONE_SCR (Dipipanone in Urine by Screen)

    - Common Name: Dipipanone in Urine by Screen method
    - Long Name:
    - Test Type:
    - Panels:
    - Equivalent Tests:
    - Not Equivalent Tests:
    - Indications:
    - Description:
    - Related Tests:
    - Approximate Reference Range (Each site will have slight variations):
    - Comments:

    For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.

    - Test Method Variance:
    - Other:

3. U_FENTANYL_CNF (Fentanyl in Urine by Confirmation)

    - Common Name: Fentanyl in Urine by Confirmatory method
    - Long Name:
    - Test Type:
    - Panels:

- Equivalent Tests:
- Not Equivalent Tests:
- Indications:
- Description:
- Related Tests:
- Approximate Reference Range (Each site will have slight variations):
- Comments: For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.
- Test Method Variance:
- Other:

4. U_FENTANYL_SCR (Fentanyl in Urine by Screen)

    - Common Name: Fentanyl in Urine by Screen method
    - Long Name:
    - Test Type:
    - Panels:
    - Equivalent Tests:
    - Not Equivalent Tests:
    - Indications:
    - Description:
    - Related Tests:
    - Approximate Reference Range (Each site will have slight variations):
    - Comments: For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.
    - Test Method Variance:
    - Other:

5. U_LEVORPHANOL_CNF (Levorphanol in Urine by Confirmation) ***NEEDS TO BE UPDATED***

   - Common Name: Codeine in Urine by Confirmatory method
   - Long Name:
   - Test Type:
   - Panels:
   - Equivalent Tests:
   - Not Equivalent Tests:
   - Indications:
   - Description:
   - Related Tests:
   - Approximate Reference Range (Each site will have slight variations):
   - Comments:

   For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.

   - Test Method Variance:
   - Other:

6. U_LEVORPHANOL_SCR (Levorphanol in Urine by Screen) ***NEEDS TO BE UPDATED***

   - Common Name: Codeine in Urine by Screen method
   - Long Name:
   - Test Type:
   - Panels:
   - Equivalent Tests:
   - Not Equivalent Tests:
   - Indications:
   - Description:

- Related Tests:
- Approximate Reference Range (Each site will have slight variations):
- Comments: For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.
- Test Method Variance:
- Other:

7. U_MEPERIDINE_CNF (Meperidine in Urine by Confirmation) ***NEEDS TO BE UPDATED***

    - Common Name: Codeine in Urine by Confirmatory method
    - Long Name:
    - Test Type:
    - Panels:
    - Equivalent Tests:
    - Not Equivalent Tests:
    - Indications:
    - Description:
    - Related Tests:
    - Approximate Reference Range (Each site will have slight variations):
    - Comments: For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.
    - Test Method Variance:
    - Other:

8. U_MEPERIDINE_SCR (Meperidine in Urine by Screen) ***NEEDS TO BE UPDATED***

- Common Name: Codeine in Urine by Screen method
- Long Name:
- Test Type:
- Panels:
- Equivalent Tests:
- Not Equivalent Tests:
- Indications:
- Description:
- Related Tests:
- Approximate Reference Range (Each site will have slight variations):
- Comments:

For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.

- Test Method Variance:
- Other:

9. U_METHADONE_CNF (Methadone in Urine by Confirmation) ***NEEDS TO BE UPDATED***

    - Common Name: Codeine in Urine by Confirmatory method
    - Long Name:
    - Test Type:
    - Panels:
    - Equivalent Tests:
    - Not Equivalent Tests:
    - Indications:
    - Description:
    - Related Tests:
    - Approximate Reference Range (Each site will have slight variations):

- Comments: For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.
- Test Method Variance:
- Other:

10. U_METHADONE_SCR (Methadone in Urine by Screen) ***NEEDS TO BE UPDATED***

    - Common Name: Codeine in Urine by Screen method
    - Long Name:
    - Test Type:
    - Panels:
    - Equivalent Tests:
    - Not Equivalent Tests:
    - Indications:
    - Description:
    - Related Tests:
    - Approximate Reference Range (Each site will have slight variations):
    - Comments:

    For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.

    - Test Method Variance:
    - Other:

11. U_NALTREXOL_CNF (Naltrexol in Urine by Confirmation) ***NEEDS TO BE UPDATED***

    - Common Name: Codeine in Urine by Confirmatory method
    - Long Name:

- Test Type:
- Panels:
- Equivalent Tests:
- Not Equivalent Tests:
- Indications:
- Description:
- Related Tests:
- Approximate Reference Range (Each site will have slight variations):
- Comments: For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.
- Test Method Variance:
- Other:

12. U_NALTREXOL_SCR (Naltrexol in Urine by Screen) ***NEEDS TO BE UPDATED***

    - Common Name: Codeine in Urine by Screen method
    - Long Name:
    - Test Type:
    - Panels:
    - Equivalent Tests:
    - Not Equivalent Tests:
    - Indications:
    - Description:
    - Related Tests:
    - Approximate Reference Range (Each site will have slight variations):
    - Comments:

For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.

- Test Method Variance:
- Other:

13. U_PENTAZOCINE_CNF (Pentazocine in Urine by Confirmation) ***NEEDS TO BE UPDATED***

    - Common Name: Codeine in Urine by Confirmatory method
    - Long Name:
    - Test Type:
    - Panels:
    - Equivalent Tests:
    - Not Equivalent Tests:
    - Indications:
    - Description:
    - Related Tests:
    - Approximate Reference Range (Each site will have slight variations):
    - Comments:

    For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.

    - Test Method Variance:
    - Other:

14. U_PENTAZOCINE_SCR (Pentazocine in Urine by Screen) ***NEEDS TO BE UPDATED***

    - Common Name: Codeine in Urine by Screen method
    - Long Name:

- Test Type:
- Panels:
- Equivalent Tests:
- Not Equivalent Tests:
- Indications:
- Description:
- Related Tests:
- Approximate Reference Range (Each site will have slight variations):
- Comments: For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.
- Test Method Variance:
- Other:

15. U_PROPOXYPHENE_CNF (Propoxyphene in Urine by Confirmation) ***NEEDS TO BE UPDATED***

    - Common Name: Codeine in Urine by Confirmatory method
    - Long Name:
    - Test Type:
    - Panels:
    - Equivalent Tests:
    - Not Equivalent Tests:
    - Indications:
    - Description:
    - Related Tests:
    - Approximate Reference Range (Each site will have slight variations):
    - Comments: For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.

- Test Method Variance:
- Other:

16. U_PROPOXYPHENE_SCR (Propoxyphene in Urine by Screen) ***NEEDS TO BE UPDATED***

    - Common Name: Codeine in Urine by Screen method
    - Long Name:
    - Test Type:
    - Panels:
    - Equivalent Tests:
    - Not Equivalent Tests:
    - Indications:
    - Description:
    - Related Tests:
    - Approximate Reference Range (Each site will have slight variations):
    - Comments: For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.
    - Test Method Variance:
    - Other:

17. U_SUFENTANIL_CNF (Sufentanil in Urine by Confirmation) ***NEEDS TO BE UPDATED***

    - Common Name: Codeine in Urine by Confirmatory method
    - Long Name:
    - Test Type:
    - Panels:
    - Equivalent Tests:
    - Not Equivalent Tests:
    - Indications:

- Description:
- Related Tests:
- Approximate Reference Range (Each site will have slight variations):
- Comments: For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.
- Test Method Variance:
- Other:

18. U_SUFENTANIL_SCR (Sufentanil in Urine by Screen) ***NEEDS TO BE UPDATED***

    - Common Name: Codeine in Urine by Screen method
    - Long Name:
    - Test Type:
    - Panels:
    - Equivalent Tests:
    - Not Equivalent Tests:
    - Indications:
    - Description:
    - Related Tests:
    - Approximate Reference Range (Each site will have slight variations):
    - Comments: For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.
    - Test Method Variance:
    - Other:

19. U_TAPENTADOL_CNF (Tarpentadol in Urine by Confirmation) ***NEEDS TO BE UPDATED***

- Common Name: Codeine in Urine by Confirmatory method
- Long Name:
- Test Type:
- Panels:
- Equivalent Tests:
- Not Equivalent Tests:
- Indications:
- Description:
- Related Tests:
- Approximate Reference Range (Each site will have slight variations):
- Comments:

For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.

- Test Method Variance:
- Other:

20. U_TAPENTADOL_SCR (Tarpentadol in Urine by Screen) ***NEEDS TO BE UPDATED***

    - Common Name: Codeine in Urine by Screen method
    - Long Name:
    - Test Type:
    - Panels:
    - Equivalent Tests:
    - Not Equivalent Tests:
    - Indications:
    - Description:
    - Related Tests:
    - Approximate Reference Range (Each site will have slight variations):

- Comments:

For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.

- Test Method Variance:
- Other:

21. U_TRAMADOL_CNF (Tramadol in Urine by Confirmation) ***NEEDS TO BE UPDATED***

    - Common Name: Codeine in Urine by Confirmatory method
    - Long Name:
    - Test Type:
    - Panels:
    - Equivalent Tests:
    - Not Equivalent Tests:
    - Indications:
    - Description:
    - Related Tests:
    - Approximate Reference Range (Each site will have slight variations):
    - Comments: For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.
    - Test Method Variance:
    - Other:

22. U_TRAMADOL_SCR (Tramadol in Urine by Screen) ***NEEDS TO BE UPDATED***

    - Common Name: Codeine in Urine by Screen method
    - Long Name:

- Test Type:
- Panels:
- Equivalent Tests:
- Not Equivalent Tests:
- Indications:
- Description:
- Related Tests:
- Approximate Reference Range (Each site will have slight variations):
- Comments:

For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.

- Test Method Variance:
- Other:

23. U_NARCOTIC_SCR (Narcotics and opioids in Urine by Screen) ***NEEDS TO BE UPDATED***

    - Common Name: Codeine in Urine by Screen method
    - Long Name:
    - Test Type:
    - Panels:
    - Equivalent Tests:
    - Not Equivalent Tests:
    - Indications:
    - Description:
    - Related Tests:
    - Approximate Reference Range (Each site will have slight variations):

- Comments: For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.
- Test Method Variance:
- Other:

1.5.4 Loosely referred to as opioids

1. U_BUPRENORPHINE_CNF (Buprenorphine in Urine by Confirmation)
    - Common Name: Buprenorphine in Urine by Confirmatory method
    - Long Name:
    - Test Type:
    - Panels:
    - Equivalent Tests:
    - Not Equivalent Tests:
    - Indications:
    - Description:
    - Related Tests:
    - Approximate Reference Range (Each site will have slight variations):
    - Comments: For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.
    - Test Method Variance:
    - Other:
2. U_BUPRENORPHINE_SCR (Buprenorphine in Urine by Screen)
    - Common Name: Buprenorphine in Urine by Screen method
    - Long Name:
    - Test Type:

- Panels:
- Equivalent Tests:
- Not Equivalent Tests:
- Indications:
- Description:
- Related Tests:
- Approximate Reference Range (Each site will have slight variations):
- Comments: For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.
- Test Method Variance:
- Other:

3. U_BUTORPHANOL_CNF (Butorphanol in Urine by Confirmation)

- Common Name: Butorphanol in Urine by Confirmatory method
- Long Name:
- Test Type:
- Panels:
- Equivalent Tests:
- Not Equivalent Tests:
- Indications:
- Description:
- Related Tests:
- Approximate Reference Range (Each site will have slight variations):
- Comments: For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.

- Test Method Variance:
- Other:

4. U_BUTORPHANOL_SCR (Butorphanol in Urine by Screen)
    - Common Name: Butorphanol in Urine by Screen method
    - Long Name:
    - Test Type:
    - Panels:
    - Equivalent Tests:
    - Not Equivalent Tests:
    - Indications:
    - Description:
    - Related Tests:
    - Approximate Reference Range (Each site will have slight variations):
    - Comments: For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.
    - Test Method Variance:
    - Other:

5. U_NALBUPHINE_CNF (Nalbuphine in Urine by Confirmation) ***NEEDS TO BE UPDATED***
    - Common Name: Codeine in Urine by Confirmatory method
    - Long Name:
    - Test Type:
    - Panels:
    - Equivalent Tests:
    - Not Equivalent Tests:
    - Indications:
    - Description:

- Related Tests:
- Approximate Reference Range (Each site will have slight variations):
- Comments: For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.
- Test Method Variance:
- Other:

6. U_NALBUPHINE_SCR (Nalbuphine in Urine by Screen) ***NEEDS TO BE UPDATED***

    - Common Name: Codeine in Urine by Screen method
    - Long Name:
    - Test Type:
    - Panels:
    - Equivalent Tests:
    - Not Equivalent Tests:
    - Indications:
    - Description:
    - Related Tests:
    - Approximate Reference Range (Each site will have slight variations):
    - Comments: For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.
    - Test Method Variance:
    - Other:

7. U_NALOXONE_CNF (Naloxone in Urine by Confirmation) ***NEEDS TO BE UPDATED***

- Common Name: Codeine in Urine by Confirmatory method
- Long Name:
- Test Type:
- Panels:
- Equivalent Tests:
- Not Equivalent Tests:
- Indications:
- Description:
- Related Tests:
- Approximate Reference Range (Each site will have slight variations):
- Comments: For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.
- Test Method Variance:
- Other:

8. U_NALOXONE_SCR (Naloxone in Urine by Screen) ***NEEDS TO BE UPDATED***

    - Common Name: Codeine in Urine by Screen method
    - Long Name:
    - Test Type:
    - Panels:
    - Equivalent Tests:
    - Not Equivalent Tests:
    - Indications:
    - Description:
    - Related Tests:
    - Approximate Reference Range (Each site will have slight variations):
    - Comments:

For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.

- Test Method Variance:
- Other:

9. U_NALTREXONE_CNF (Naltrexone in Urine by Confirmation) ***NEEDS TO BE UPDATED***

    - Common Name: Codeine in Urine by Confirmatory method
    - Long Name:
    - Test Type:
    - Panels:
    - Equivalent Tests:
    - Not Equivalent Tests:
    - Indications:
    - Description:
    - Related Tests:
    - Approximate Reference Range (Each site will have slight variations):
    - Comments: For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.
    - Test Method Variance:
    - Other:

10. U_NALTREXONE_SCR (Naltrexone in Urine by Screen) ***NEEDS TO BE UPDATED***

    - Common Name: Codeine in Urine by Screen method
    - Long Name:
    - Test Type:

- Panels:
- Equivalent Tests:
- Not Equivalent Tests:
- Indications:
- Description:
- Related Tests:
- Approximate Reference Range (Each site will have slight variations):
- Comments: For opioid results place the component value from the EverLOINC.SAS table into the local_cd field of the LAB_RESULT table. The component value is seen in parentheses in this spreadsheet after each LOINC and names the form of the drug (metabolite) tested for.
- Test Method Variance:
- Other:

1.6 Glucose Tolerance Tests (GTT)

1.6.1 GTT Test_Types

(NOTE: Information about all the numerous GTT TEST_TYPES is included in this document)

- Common Name: OGTT; GTT; Oral glucose tolerance test; glucose tolerance test

Test Types and Long Names: See Table 1. Table 1. Glucose Tolerance Test TEST_TYPE and Long Name TEST_TYPE LONGNAME

1. GTT_0_5 (Glucose Tolerance 1/2 hour post XXX challenge (glucose dose not specified) ***NEEDS TO BE UPDATED***
2. GTT_1 (Glucose Tolerance 1 hour post XXX challenge (glucose dose not specified) ***NEEDS TO BE UPDATED***
3. (GTT_1_5 Deprecated) (Glucose Tolerance 1 1/2 hour post XXX challenge (glucose dose not specified) ***NEEDS TO BE UPDATED***
4. GTT_2 (Glucose Tolerance 2 hour post XXX challenge (glucose dose not specified) ***NEEDS TO BE UPDATED***

5. GTT_3 (Glucose Tolerance 3 hour post XXX challenge (glucose dose not specified) ***NEEDS TO BE UPDATED***

6. (GTT_4 Deprecated) (Glucose Tolerance 4 hour post XXX challenge (glucose dose not specified)

7. (GTT_5 Deprecated) (Glucose Tolerance 5 hour post XXX challenge (glucose dose not specified)

8. (GTT_6 Deprecated) (Glucose Tolerance 6 hour post XXX challenge (glucose dose not specified)

9. (GTT_7 Deprecated) (Glucose Tolerance 7 hour post XXX challenge (glucose dose not specified)

10. GTT50_1 (Glucose Tolerance 1 hour post 50 g oral challenge) ***NEEDS TO BE UPDATED***

11. GTT75_1 (Glucose Tolerance 1 hour post 75 g oral challenge) ***NEEDS TO BE UPDATED***

12. (GTT75_1_5 Deprecated) (Glucose Tolerance 1 1/2 hour post 75 g oral challenge)

13. GTT75_2 (Glucose Tolerance 2 hour post 75 g oral challenge) ***NEEDS TO BE UPDATED***

14. GTT100_0_5 (Glucose Tolerance 1/2 hour post 100 g oral challenge) ***NEEDS TO BE UPDATED***

15. GTT100_1 (Glucose Tolerance 1 hour post 100 g oral challenge) ***NEEDS TO BE UPDATED***

16. (GTT100_1_5 Deprecated) (Glucose Tolerance 1 1/2 hour post 100 g oral challenge)

17. GTT100_2 (Glucose Tolerance 2 hour post 100 g oral challenge) ***NEEDS TO BE UPDATED***

18. GTT100_3 (Glucose Tolerance 3 hour post 100 g oral challenge) ***NEEDS TO BE UPDATED***

19. (GTT100_3_5 Deprecated) (Glucose Tolerance 3 1/2 hour post 100 g oral challenge)

20. (GTT100_4 Deprecated) (Glucose Tolerance 4 hour post 100 g oral challenge)

21. (GTT100_5 Deprecated) (Glucose Tolerance 5 hour post 100 g oral challenge)

22. (GTT100_6 Deprecated) (Glucose Tolerance 6 hour post 100 g oral challenge)

23. (GTT100_PRE Deprecated) (Glucose pre 100 g oral challenge, fasting)

24. (GTT50_PRE Deprecated) (Glucose pre 50 g oral challenge, fasting)

25. (GTT75_PRE Deprecated) (Glucose pre 75 g oral challenge, fasting)

26. (GTT_PRE Deprecated) (Glucose pre oral challenge, fasting; glucose dose not specified) It is anticipated that each site will populate some subset of the TEST_TYPEs listed above. Sites are not expected to find that all are in use at their locations. It is also anticipated that the 1 hour and 2 hour TEST_TYPEs will be the more common time points (see below).

    - Panels: NA
    - Equivalent Tests: The test types in Table 1 that contain "pre" in the test type name are fasting glucose values (i.e., values obtained prior to the patient drinking the glucose load). For research projects where fasting glucose tests are assessed, it may be appropriate to ask the investigator whether he/she also wants to include these fasting glucose tests that were obtained as part of a GTT challenge test. The GTT "pre" tests are not included in the GLU_F (fasting glucose test type) in the VDW since they are included in the GTT test types.
    - Not Equivalent Tests: Do not include any tests where the name or title of the test includes "post prandial" or "lactose tolerance." GGT (or GGTP, gamma-glutamyl transpeptidase) is an unrelated test. Random glucose tests are related but not equivalent tests.
    - Indications: The oral glucose tolerance test (GTT) is considered a "challenge test" in that it is used to assess the presence of gestational diabetes in pregnant women based on a "challenge" or loading dose of glucose. It is also used (not common) to assess patients

who have signs and symptoms of diabetes mellitus but whose fasting plasma glucose is normal or suggests prediabetes. The GTT provides information about both the ability of the pancreas to secrete insulin after a glucose "load" and the body's response to insulin. Interpretation of the results of the GTT is usually based on both the blood glucose concentrations measured before the glucose load is ingested and at set time points after drinking the glucose load. In women who had gestational diabetes, a postpartum glucose evaluation is also often done. In this situation, either a 2 hour post 75 g glucose load test (see below) or a standard fasting glucose is obtained within 6 weeks after delivery.

- Description: A standard 50-, 75-, or 100-gram dose of an oral glucose solution is ingested (over 5 minutes for the 75-g dose) after an overnight fast. Blood samples are usually drawn before the test, between 0 and 2 hours, and at 2 hours. In pregnant women, a "screening" challenge GTT test is often done that measures plasma glucose 1 hour after a 50-g glucose load. If the glucose level is $>$ 130 mg/dL, then a 100-g glucose load is done (see Table 2). Glucose concentrations are drawn before drinking the glucose load for the test, and at 1 hour, 2 hours, and 3 hours after drinking the glucose load. Time periods beyond 4 hours are not routinely used for gestational diabetes assessment. We anticipate that the 75 g GTT test will be used more often as we go forward in time. This is because the 2011 American Diabetes Association (ADA) criteria for gestational diabetes mellitus recommend a 75g GTT in all pregnant women at 24-28 weeks gestation. The times and values used in this newly-recommended standard include a fasting result, and a 1 hr and 2 hr result as part of the GTT. A 75g 2hr value $>$153 mg/dl during pregnancy is diagnostic for gestational diabetes mellitus.
- Related Tests: Fasting glucose, random glucose
- Approximate Reference Range: Values above which the test results are considered abnormal or high or indicative of diabetes at 1, 2, and/or 3 hours are shown in Table 2.

Table 2. Threshold Values for Diagnosis Diabetes Mellitus Using the Glucose Tolerance Test Glucose Load for GTT Fasting Plasma Glucose (mg/dL) GTT Value at 1 hour (or 30 or 90 minutes) GTT Value at 2 hours GTT Value at 3 hours Gestational diabetes 50 g $<$ 95 $>$ 130

75 g < 95 > 153 100 g < 95 >180 * >155 * >140 * Assessing glucose tolerance in individual who is not pregnant (75 g load) Normal < 100 < 200 < 140 Prediabetes 100 – 125 > 200 140-199 Diabetes > 126 > 200 > 200 If 2 or more glucose levels exceed the threshold, then a diagnosis of gestational diabetes is made.

- Comments: Component test names for the GTT vary widely from site to site. Sometimes the words "gestational," "gestational diabetes," or "OB screen" are in the name. Sometimes the word "tolerance" is in the name, but not always.
- Test Method Variance: See statements above about the varying glucose loads that are used.
- Other: Some sites do not use unique CPT or LOINC codes for different glucose loads. There may be unique codes for the different time increments (1hr, 2 hr, etc), but not always. The text string field usually specifies the hour (for example, a GTT 3 hr may have three rows of data in which the text string specifies the specific hour [1 hr, 2 hr, 3 hr]). Loading dose of glucose is not included in electronic data at all sites. Because the loading dose of glucose is not always indicated in the electronic lab data stream, it is crucial to ensure the abnormal flags are populated in the VDW. As shown in Table 2, the criteria for determining whether or not the lab results are abnormal vary, not only based on the time the sample was obtained, but also based on the glucose load the individual ingested. The abnormal flag, along with the result value, may be the only way to conclusively know whether or not the test result was abnormal.

1.7 Cell Markers

1.7.1 CD4 (CD4 Count, T-cell helper subset)

NEEDS TO BE UPDATED

1.8 Microbiology

1.8.1 (HCV) Hepatitis C Virus Test Types

1. HCV_AB (Hepatitis C virus antibody) ***NEEDS TO BE UPDATED***
2. HCV_AB_QL (Hepatitis C virus antibody presence found) ***NEEDS TO BE UPDATED***

3. HCV_AB_QL_PR (Hepatitis C virus antibody presence found using probe method) ***NEEDS TO BE UPDATED***

4. HCV_GENO (Hepatitis C virus genotype) ***NEEDS TO BE UPDATED***

5. HCV_GENO_PR (Hepatitis C virus genotype probe method) ***NEEDS TO BE UPDATED***

6. HCV_RNA (Hepatitis C virus RNA viral load) ***NEEDS TO BE UPDATED***

7. HCV_RNA_LOG (Hepatitis C virus RNA Log Units of viral load) ***NEEDS TO BE UPDATED***

8. HCV_RNA_QL_PR (Hepatitis C virus RNA Presence by probe) ***NEEDS TO BE UPDATED***

9. HCV_RNA_QL (Hepatitis C virus RNA Presence) ***NEEDS TO BE UPDATED***

1.8.2 (HIV) Human Immunodeficiency Virus Test Types

1. HIV1_AB_CNF_QL (HIV 1 Antibody in Serum, Plasma or Blood by Confirmatory method - qualitative) ***NEEDS TO BE UPDATED***

2. HIV1_AB_SCR_QL (HIV 1 Antibody in Serum, Plasma or Blood by Screen method - qualitative) ***NEEDS TO BE UPDATED***

3. HIV1_AB_SCR_QN (HIV 1 Antibody in Serum, Plasma or Blood by Screen method - quantitative) ***NEEDS TO BE UPDATED***

4. HIV12_AB_CNF_QL (HIV 1 and HIV 2 Antibody in Serum, Plasma or Blood by Confirmatory method - qualitative) ***NEEDS TO BE UPDATED***

5. HIV12_AB_SCR_QL (HIV 1 and HIV 2 Antibody in Serum, Plasma or Blood by Screen method - qualitative) ***NEEDS TO BE UPDATED***

6. HIV12_AB_SCR_QN (HIV 1 and HIV 2 Antibody in Serum, Plasma or Blood by Screen method - quantitative) ***NEEDS TO BE UPDATED***

7. HIV2_AB_CNF_QL (HIV 2 Antibody in Serum, Plasma or Blood by Confirmatory method - qualitative) ***NEEDS TO BE UPDATED***
8. HIV2_AB_SCR_QL (HIV 2 Antibody in Serum, Plasma or Blood by Screen method - qualitative) ***NEEDS TO BE UPDATED***
9. HIV2_AB_SCR_QN (HIV 2 Antibody in Serum, Plasma or Blood by Screen method - quantitative) ***NEEDS TO BE UPDATED***
10. HIV1_AG_QL (HIV 1 Antigen in Serum or Plasma - qualitative) ***NEEDS TO BE UPDATED***
11. HIV1_AG_QN (HIV 1 Antigen in Serum or Plasma - quantitative) ***NEEDS TO BE UPDATED***
12. HIV1_RNA (HIV 1 RNA (viral load) in Serum or Plasma) ***NEEDS TO BE UPDATED***
13. HIV1_RNA_LOG (HIV 1 RNA (viral load - log) in Serum or Plasma) ***NEEDS TO BE UPDATED***
14. HIV2_RNA (HIV 2 RNA (viral load) in Serum or Plasma) ***NEEDS TO BE UPDATED***
15. HIV2_RNA_LOG (HIV 2 RNA (viral load - log) in Serum or Plasma) ***NEEDS TO BE UPDATED***
16. HIV1_RNA_QL (HIV 1 RNA (detection) in Serum or Plasma - qualitative) ***NEEDS TO BE UPDATED***
17. HIV12_RNA_QL (HIV 1 and HIV 2 RNA (detection) in Serum or Plasma - qualitative) ***NEEDS TO BE UPDATED***
18. HIV1_AB_AG_QL (HIV 1 Antibody and Antigen) ***NEEDS TO BE UPDATED***
19. HIV12_AB_HIV1_AG_QL (HIV 1 and HIV 2 Antibody and HIV 1 Antigen - qualitative) ***NEEDS TO BE UPDATED***
20. HIV12_AB_HIV1_AG_QN (HIV 1 and HIV 2 Antibody and HIV 1 Antigen - quantitative) ***NEEDS TO BE UPDATED***
21. HIV1_QL (HIV 1 - qualitative) ***NEEDS TO BE UPDATED***
22. HIV12_QL (HIV 1 and HIV 2 algorithm interpretation - qualitative) ***NEEDS TO BE UPDATED***

23. HIV1_AB_SCR_QL_S (HIV 1 Antibody in Saliva by Screen method - qualitative) ***NEEDS TO BE UPDATED***

24. HIV1_AB_SCR_QN_S (HIV 1 Antibody in Saliva by Screen method - quantitative) ***NEEDS TO BE UPDATED***

1.8.3 HPVDNA_CVX (Human Papilloma Virus DNA Test, Cervical Specimen)

- Common Name: HPV DNA, specimen from cervix
- Long Name: Human Papilloma virus (HPV) DNA test, cervical specimen, high/high + intermediate risk genotypes
- Test Type: HPVDNA_CVX
- Panels: In addition to single components, includes one LOINC for panel: human papilloma virus high + low risk DNA
- Equivalent Tests: N/A
- Not Equivalent Tests: N/A
- Indications: This test is used in conjunction with Pap Tests in cervical cancer screening and prevention programs to test for the presence of the Human Papilloma Virus (HPV) which causes most cervical cancers. Its use varies with the presumed change in sexual partners in different age ranges. Routine use is often limited to women in the range from mid-teens until 30 years old. When Pap Test results for a woman in this age range are mildly abnormal, this test is used to determine the presence of "high risk" strains of HPV that are sufficient to warrant colposcopy and targeted biopsies to rule out serious cervical abnormalities. When women over age 30 have persistent mild cervical infections, as indicated by repeated abnormal Pap Tests, it is used to determine whether colposcopy and targeted biopsies or more frequent Pap Tests are warranted.
- Description: This test shows the presence or absence of DNA from "high risk" strains (also known as genotypes) of HPV. Currently, the only FDA approved HPV DNA test is the Digene Hybrid Capture 2 (HC2), though other tests may be used. The test is performed on a cervical specimen sample which may be residual specimen from a Pap Test performed using a liquidbased cytology collection method.

- Related Tests: N/A
- Approximate Reference Range (Each site will have slight variations): N/A
- Comments: Strains are classified as high risk relative to other HPV strains, not with respect to the absolute risk for developing serious cervical abnormalities. The prevalence of high risk HPV strains in the population of women of screening age is approximately 15%. As of 2010, high risk strains include 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, and 68 with 16 and 18 being most prevalent. Test results are unlikely to specify strain, only the presence or absence of 1+ high risk strains. For the purposes of the ABN_IND variable: abnormal = positive for 1+ high risk HPV strain(s); normal = no high risk HPV strains found. The HPV DNA tests came into widespread use in cervical cancer screening and prevention programs in the mid 2000s. HPV is also associated with vulvar, penile, and anal intraepithelial neoplasia and cancer. If you are able to distinguish specimen body source, only specimens taken from the cervix should be include in this test type. A test does not need to test for every high risk strain to be included.
- Test Method Variance: N/A

1.8.4 HPVDNA_UN (Human Papilloma Virus DNA Test, Specimen Source/Site Unknown)

- Common Name: HPV DNA, specimen source/site unknown
- Long Name: Human Papilloma virus (HPV) DNA test, specimen from unknown site, high/high + intermediate risk genotypes
- Test Type: HPVDNA_UN
- Panels:
- Equivalent Tests: N/A
- Not Equivalent Tests: N/A
- Indications: This test can be used in conjunction with Pap Tests in cervical cancer screening and prevention programs to test for the presence of the Human Papilloma Virus (HPV) which causes most cervical

cancers. However, for this specific test type, the body site from which the specimen was obtained is not known (i.e., could be cervical, anal, etc). The use of HPV DNA testing varies with the presumed change in sexual partners in different age ranges. Routine use is often limited to women in the range from mid-teens until 30 years old. When Pap Test results for a woman in this age range are mildly abnormal, this test is used to determine the presence of "high risk" strains of HPV that are sufficient to warrant colposcopy and targeted biopsies to rule out serious cervical abnormalities.

- Description: This test shows the presence or absence of DNA from "high risk" strains (also known as genotypes) of HPV.
- Related Tests: N/A
- Approximate Reference Range (Each site will have slight variations): N/A
- Comments: Strains are classified as high risk relative to other HPV strains, not with respect to the absolute risk for developing serious cervical abnormalities. The prevalence of high risk HPV strains in the population of women of screening age is approximately 15%. As of 2010, high risk strains include 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, and 68 with 16 and 18 being most prevalent. Test results are unlikely to specify strain, only the presence or absence of 1+ high risk strains. For the purposes of the ABN_IND variable: abnormal = positive for 1+ high risk HPV strain(s); normal = no high risk HPV strains found. The HPV DNA tests came into widespread use in cervical cancer screening and prevention programs in the mid 2000s. HPV is also associated with vulvar, penile, and anal intraepithelial neoplasia and cancer.
- Test Method Variance: N/A

1.9 Blank Template

1.9.1 TEST NAME—FOR FUTURE USE

- Common Name:
- Long Name:
- Test Type:

- Panels:
- Equivalent Tests:
- Not Equivalent Tests:
- Indications:
- Description:
- Related Tests:
- Approximate Reference Range (Each site will have slight variations):
- Comments:
- Test Method Variance:
- Other:
  - Associated LOINC:
  - Associated CPT: