Louisiana Office of Public Health Laboratories	
Test Name	AST, ALT, Total Bilirubin, Creatinine, Uric Acid
PHL Location	Central Laboratory (To be referred to LabCorp)
CPT Code	AST: 84450 ALT: 84460 Bilirubin, Total: 82247 Creatinine: 82565 Uric Acid: 84550
Synonyms	AST = SGOT, ALT = SGPT
Brief Description of Test	AST – Aspartate aminotransferase is present in high activity in heart, skeletal muscle, and liver. Increased serum AST activity commonly follows myocardial infarction, pulmonary emboli, skeletal muscle trauma, alcoholic cirrhosis, viral hepatitis, and drug-induced hepatitis. ALT – Alanine aminotransferase is present in high activity in liver, skeletal muscle, heart, and kidney. Serum ALT increases rapidly in liver cell necrosis, hepatitis, hepatic cirrhosis, liver tumors, obstructive jaundice, Reye's syndrome, extensive trauma to skeletal muscle, myositis, myocarditis, and myocardial infarction. Bilirubin, Total – Total bilirubin (TB) in serum is the sum of unconjugated bilirubin (Bu), mono- and di-glucuronide conjugated bilirubin (Bc), and delta bilirubin (DELB, a bilirubin fraction covalently bound to albumin). With the exception of anicteric jaundice, serum TB is invariably increased in jaundice. Causes of jaundice are *pre-hepatic*, resulting from various hemolytic diseases; *hepatic*, resulting from hepatocellular injury or obstruction; and *post-hepatic*, resulting from obstruction of the hepatic or common bile ducts. Creatinine – Serum creatinine excretion is a function of lean body mass in normal persons. The serum creatinine concentration is higher in men than in women. Serum creatinine is increased in acute or chronic renal failure, urinary tract obstruction, reduced renal blood flow, shock, dehydration, and rhabdomyolysis. Causes of low serum creatinine concentration include debilitation with decreased muscle mass. Uric Acid – Uric acid is the end product of purine metabolism. Elevated serum uric acid levels occur in renal failure, prerenal azotemia, gout, lead poisoning, excessive cell destruction (e.g., following chemotherapy), hemolytic anemia, congestive heart failure, after myocardial infarction, some endocrine disorders, acidosis, toxemia of pregnancy, hereditary gout, and glycogen storage disease type I. A low uric acid level may be found following treatment by some drugs (e.g., low-dose aspirin), with low dietary intake of purine, in the presence of renal tubular defects, and in xanthinuria.

<table>
<tr><td>Possible Results</td><td>AST, ALT – reported in International Units per Liter (IU/L).

Total Bilirubin, Creatinine, and Uric Acid – Reported in milligrams per deciliter (mg/dL).</td></tr>
<tr><td>Reference Range</td><td>Reference range for test, may be broken out into age, sex or racial

Groups. For qualitative tests may be present or absent.

<table>
<tr><th colspan="2">Normal Range</th></tr>
<tr><td>AST:</td><td>0-40 IU/L</td></tr>
<tr><td>ALT:</td><td>Males: 0-44 IU/L Females 0-32 IU/L</td></tr>
<tr><td>Bilirubin, Total:</td><td>0.0-1.2 mg/dL</td></tr>
<tr><td>Creatinine:</td><td>1 to <3 yr: Males & Females: 0.19-0.42 mg/dL

3 to <5 yr Males & Females: 0.26-0.51 mg/dL

5 to <7 yr: Males & Females: 0.30-0.59 mg/dL

7 to < 9 yr: Males & Females: 0.37-0.62 mg/dL

9 to < 11 yr: Males & Females: 0.39-0.70 mg/dL

11 to < 13 yr: Males & Females: 0.42-0.75 mg/dL

13 to < 15 yr: Males & Females: 0.49-0.90 mg/dL

> 15 yr: Males: 0.76-1.27 mg/dL Females: 0.57-1.00 mg/dL</td></tr>
<tr><td>Uric Acid:</td><td>1 to 12 yr: Males: 1.9-5.8 mg/dL Females: 2.0-5.8 mg/dL

12 to 18 yr: Males: 3.4-7.8 mg/dL Females: 2.4-6.3 mg/dL

: > 18 yr: Males: 3.7-8.6 mg/dL Females: 2.5-7.1 mg/dL</td></tr>
</table>
</td></tr>
<tr><td>Specimen Type</td><td>Serum; venous</td></tr>
<tr><td>Specimen Container(s):</td><td>• Regular clot separation tube (SST).
• Transport tube</td></tr>
<tr><td>Minimum volume accepted:</td><td>0.5 ml</td></tr>
<tr><td>Collection Instructions</td><td>Collection

• venous blood should be collected in plastic, sterile Vacutainer tube and allowed to fill completely.
• allow to clot for 30-60 minutes at room temperature,
• separate serum within 2 hours of collection,</td></tr>
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<tr><td></td><td>

centrifuge for 10 minutes at the g force recommended by the vacutainer manufacturer.
send the centrifuged gel separator tube or aspirate the serum off into transport tube for shipping

Specimen labels and Specimen containers must be labeled with at least 2 identifiers:
• Patient's name
• Unique identifier (ID# or unique number: DOES NOT include Date of Birth)

Required information for specimen submission:
• Patient's name
• Unique identifier
• Date of birth/age
• Date and time of collection
• Initials of the person who collected the specimen
• Source of the specimen
• Submitter name, address, and contact number
</td></tr>
<tr><td>Storage and Transport Instructions</td><td>
<table>
<tr><th>Analyte</th><th>Room Temp
(18º-28ºC)</th><th>Refrigerated
(2º-8ºC)</th><th>Frozen
(0ºC to -20ºC)</th></tr>
<tr><td>ALT</td><td>Unacceptable</td><td>≤ 14 days</td><td>Unacceptable</td></tr>
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<tr><td>Bilirubin, Total</td><td>Unacceptable</td><td>≤ 3 days</td><td>≤ 14 days</td></tr>
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<tr><td>Uric Acid</td><td>Unacceptable</td><td>≤ 14 days</td><td>≤ 14 days</td></tr>
</table>
Specimens can be shipped refrigerated (2-8ºC) according to the chart above. For longer storage according to the chart above, serum should be poured into a sterile screw cap tube and frozen from 0 to -20 ºC. Frozen specimens must be shipped on dry ice and received solidly frozen. If samples are frozen, document the date and time the sample was frozen.
</td></tr>
<tr><td>Causes for Rejection</td><td>
Temperature at Receipt Out of Range
Outside of the acceptable time since collection
Gross hemolysis (ALT, AST, total bilirubin); Hemolysis: creatinine
Gross lipemia (total bilirubin); Excessive lipemia (ALT, creatinine)
Volume: Quantity not sufficient for testing (QNS) (Recommend at least 1 mL)
Damaged/leaking specimen container
Improperly labeled tube (name, ID# must match those on manifest & StarLims
</td></tr>
<tr><td>Limitations of the Procedure</td><td>
All aspects of the patient's history, symptoms, and other diagnostic testing must be considered along with the serum chemistry in actual patient monitoring and treatment.
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ALT - Gross hemolysis affects ALT. Excessive lipemic specimens should not be used for ALT analysis.

AST – Hemolysis falsely elevates AST results. Grossly hemolyzed specimens should not be used for AST
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Interfering Substances	Total Bilirubin – Samples must be protected from light and excessive heat. Gross hemolysis affects T. Bilirubin. Grossly lipemic specimens should not be used for Total Bilirubin analysis. No interference from drugs at therapeutic levels was found. Creatinine – Antibiotics containing cephalosporin lead to significant false-positive values if samples are drawn within four hours of a dose. With severe renal disease, creatinine is not reliable in the presence of cefoxitin therapy. There is less interference reported from the cephalosporins, cephalothin, cephaloridine, cephadrine sodium, and cephaloglycin dihydrate. Lipemia, excessive icterus (bilirubin), and hemolysis may interfere. Uric Acid – Drugs causing increased uric acid concentration include diuretics, pyrazinamide, ethambutol, and nicotinic acid. High doeses of aspirin, x-ray contrast agens, glyceryl guaiacolate, allopurinaol corticosteroids, probenecid, massive doses of vitamin C, and xanthine have been reported to decrease the uric acid.
References	LabCorp On-line Specimen Submission Test Menu. • AST – Test No. 001123 • ALT – Pub Test No. 001545 • Total Bilirubin (TBIL) – Test No. 001099 • Uric Acid – Test No. 001057 • Serum Creatinine – Test No. 001370\ • TB Panel (AST, Creat,TBili, and Uric Acid) – Test 399808 • TB/ALT Panel (ALT, AST, Creat, TBili, and Uric Acid) – Test 331228 • ALT/AST Panel (ALT and AST) – Test 035188
Additional Information	None
Release Date	5/25/2018

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