Lab Dept: Hematology

Test Name: HEMOLYTIC ANEMIA EVALUATION

General Information

Lab Order Codes: HMAE

Synonyms: HA Evaluation

CPT Codes:
82657 – Hexokinase B
82955 – G-6-PD
83020 – Hemoglobin electrophoresis (alkaline)
83021 – Hemoglobin A(2) and F
83068 – Hemoglobin stability
84087 – Glucose phosphate isomerase
84220 – Pyruvate kinase
85060 – Morphology review
85557 – Osmotic fragility

Reflexes if appropriate:
82657 – RBC Enzymes
82978 – Glutathione
83789 – Hemoglobin variant by mass spectrometry
85660 – Hemoglobin S solubility
88184 – Hemoglobin F, red cell distribution
88184 – Band 3 fluorescence staining

Hemoglobin Electrophoresis, Molecular:
81257 – HGA1/HBA2 gene analysis for common deletions or variant
81401 – HBB (hemoglobin, beta), common variants
81403 – HBB (hemoglobin, beta, beta-globin), duplication/deletion analysis

Test Includes: This is a consultative evaluation in which the case will be evaluated at Mayo Medical Laboratories, the appropriate tests performed.

The following tests will always be performed with this profile: Hemolytic Anemia Interpretation; Hemoglobin A2 and F; Hemoglobin Electrophoresis; Hemoglobin, Unstable; Osmotic Fragility, RBC; G-6-PD, QN; Pyruvate kinase, RBC; Glucose Phosphate Isomerase; Hexokinase; Morphology Review. The following reflex tests may be performed at an additional charge if indicated: Reflexed RBC Enzymes, Glutathione, Hemoglobin S Screen, Hemoglobin F Red Cell Distribution, Band 3 Fluorescence Staining RBC
Note: RBC Enzymes include: adenosine deaminase, adenylate kinase, phosphfructokinase, phophoglycerate kinase, triosephosphate isomerase, and pyrimidine 5'nucleotidase.

Logistics

Test Indications:	Useful evaluation of Hemolytic Anemia (HA) of obscure cause. Hemolytic anemia is characterized by increased red cell destruction and a decreased red cell life span. Patients have decreased hemoglobin concentrations, hematocrit, and red blood cell count. Blood smear abnormalities may include spherocytes, acanthocytes, schistocytes, stomatocytes, polychromasia, and target cells. Osmotic fragility also is increased due to the presence of spherocytes. Hemolytic anemias may be congenital or acquired. Inherited hemolytic disorders may include red cell membrane fragmentation, red cell enzyme defects, or abnormal structure of the hemoglobin molecule in the red cell. Examples of congenital HA include spherocytic HA and glucose-6-phosphate dehydrogenase (G-6-PD) deficiency, which may be intermittent, often brought on by certain drugs, fava bean ingestion of infections. Some hemoglobinopathies also may demonstrate a hemolytic process. Examples of acquired HA include: autoimmune HA, direct Coombs postitive Ham disseminated intravascular coagulation, and drug induced HA. This consultative evaluation looks for the cause of increased red cell destruction and includes testing for hereditary spherocytosis hemoglobinopathies, and red cell metabolism abnormalities.
Lab Testing Sections:	Hematology - Sendouts
Referred to:	Mayo Medical Laboratories (Test: 84157/HAEVP)
Phone Numbers:	MIN Lab: 612-813-6280 STP Lab: 651-220-6550
Test Availability:	Draw Sunday – Thursday only
Turnaround Time:	3 – 25 days, test is set up Monday - Friday
Special Instructions:	Please submit a Thalassemia/Hemoglobinopathy Information Sheet to be included with the specimen. Contact the lab for the correct form (Mayo Supply T358). Special tubes are available from lab. See Container. Specimens **must arrive at Mayo within 96 hours of draw**.

Specimen

Specimen Type:	Whole blood
Container:	Yellow top tube (ACD-solution B) **and** Lavender (EDTA) top tubes
Draw Volume:	**Patient:** 12 mL (Minimum: 5 mL) ACD blood **and** 10 mL (Minimum: 3 mL) EDTA blood **Control:** 5 mL (Minimum: 3 mL) EDTA blood (Clearly label as CONTROL SPECIMEN) **Indicate sex of control specimen on tube label.**
Processed Volume:	Same as Draw Volume

Collection:	Routine venipuncture
Special Processing:	Lab Staff: **Do Not centrifuge**. Immediately refrigerate specimens after collection. Specimens **must arrive within 96 hours** of draw. Send specimens Monday through Friday **only**. Make two well-made peripheral blood smears, Wright-stained or fixed in absolute methanol to include with blood specimens. Label appropriately. Send patient and control whole blood specimens refrigerated. Do not transfer blood to other containers**. Indicate sex of control on tube label**. Specimens cannot be frozen.
Patient Preparation:	None
Sample Rejection:	Mislabeled or unlabeled specimens; frozen specimens; gross hemolysis

Interpretive

Reference Range:	Definitive results and an interpretive report will be provided. See Hemoglobin Electrophoresis Cascade Reflex. A hematopathologist who is an expert in these disorders evaluates the case, appropriate tests are run, and an interpretive report is issued.
Critical Values:	N/A
Limitations:	Preliminary screening tests, such as complete blood count with peripheral smear and direct Coombs test, should be run before ordering this evaluation. This group of tests should not ordinarily be requested in patients who are likely to have immune hemolytic anemia (HA), such as that due to either warm or cold antibodies or to paroxysmal nocturnal hemoglobinurias. Coombs tests, tests for cold agglutinins, sucrose hemolysis, and Hams and Crosby tests are not part of the HA evaluation. In general, the foregoing tests should have been done prior to requesting HA evaluation. Since Wilson's disease is another rare cause for acute intermittent hemolysis, a test for Wilson's disease also may be appropriate prior to requesting HA evaluation.

Methodology:	Consultative Interpretation Cation Exchange/High-Performance Liquid Chromatography HPLC) Capillary Electrophoresis Isopropanol Stability Osmotic Lysis Kinetic Spectrophotometry (KS) Consultant Review Hemoglobin S Solubility Flow Cytomertry Mass Spectrometry (MS) Electrophoresis Polymerase Chain Reaction (PCR) Analysis/Mulitplex Ligation-Dependent Probe Amplification (MLPA), Polymerase Chain Reaction (PCR)/DNA Sequencing
References:	Mayo Medical Laboratories Web Page June 2012
Update:	8/25/2010: Unit and reference range update for Pyruvate Kinase, RBC and G6PD portions of testing 1/25/2011: Hgb ELP update. Reference values created for pediatric patients. Change in reflexing sequence. 4/4/2011: Specimens previously needed to arrive within 72 hours. Now need 2 stained smears. 6/7/2012: Updated reference range for adenylate kinase.