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 x2 – 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
88184 – Hemoglobin F, red cell distribution
83915 – RBC Enzymes
82978 – Glutathione

Reflexes if appropriate:
83789 – Hemoglobin variant by mass spectrometry
82664 – Isioelectric Focusing
85660 – Hemoglobin S solubility
88184 – Hemoglobin F distribution
81269 – Alpha globin gene analysis
81259 – Alpha globin gene sequencing
81364 – Beta globin gene sequencing
81363 – Beta globin cluster locus deletion/duplication
81479 – Gamma globulin full gene sequencing

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; RBC Enzymes, Glutathione. The following reflex tests may be performed at an additional charge if indicated: Hemoglobin S Solubility, Hemoglobin F Red Cell Distribution, IEF Confirms, Hemoglobin by Mass Spec, Alpha Globin Gene Analysis, Alpha Globin Gene Sequencing, Beta Globin Gene Sequencing, Beta Globin Cluster Locus Deletion/Duplication, Gamma Globulin Full Gene Sequencing, Hemolytic Anemia Summary Interp
Note: RBC Enzymes include: adenosine deaminase, adenylate kinase, phosphfructokinase, phophoglycerate kinase, triosephosphate isomerase, and pyrimidine 5'nucleotidase.

Logistics

Test Indications:	Evaluation of lifelong or inherited hemolytic anemias, including red cells membrane disorders, unstable or abnormal hemoglobin variants, and red cell enzyme disorders. Cold agglutinin disorders and autoimmune disorders should be excluded prior to testing. This evaluation is not suitable for acquired causes of hemolysis.
Lab Testing Sections:	Hematology - Sendouts
Referred to:	Mayo Medical Laboratories (MML Test: HAEV1)
Phone Numbers:	MIN Lab: 612-813-6280 STP Lab: 651-220-6550
Test Availability:	Draw Sunday – Thursday only
Turnaround Time:	3 – 25 days, test performed Monday - Friday
Special Instructions:	Please submit the **strongly recommended** Metabolic Hematology Patient Information Sheet to be included with the specimen. Contact the lab for the correct form (Mayo Supply T810). Special tubes are available from lab. See Container. Specimens **must arrive at Mayo within 72 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** 8 mL (Minimum: 3 mL) EDTA blood **Control:** 4 mL (Minimum: 3 mL) EDTA blood (Clearly labeled as NORMAL CONTROL SPECIMEN)
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 72 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. **Collect a NORMAL CONTROL:** 1. Collect a control specimen from a normal (healthy), unrelated, nonsmoking person at the same time as the patient. 2. Label the control tube with a patient label of the test patient (not the anonymous control subject) and clearly hand write NORMAL CONTROL on the outermost label. 3. Immediately refrigerate specimen after collection. 4. Send specimen in original tube. Do not aliquot. 5. Rubber band patient specimens and control vial together. Send patient and control whole blood specimens and slides together and refrigerated. Do not transfer blood to other containers**.**
Patient Preparation:	None
Sample Rejection:	Mislabeled or unlabeled specimens; frozen specimens; gross hemolysis; no control sample provided or abnormal control sample

Interpretive

Reference Range:	Definitive results and an interpretive report will be provided. 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:

Recent transfusion may cause unreliable results.

A normal shipping control for osmotic fragility (OF) is necessary to exclude false-positive results due to preanalytical artifact. OF and eosin-5-maleimide (EMA) binding testing will be canceled if no shipping control is received or if the shipping control is abnormal.

This panel is most effectively interpreted in the context of clinical information and the peripheral blood morphology. Inclusion of the patient info sheet with the specimen will maximize the interpretive capabilities of the panel.

This group of tests should not be 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. Since Wilson disease is another rare cause for acute intermittent hemolysis, testing for Wilson disease also may be appropriate prior to requesting an 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 Clinic Laboratories June 2023

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.
3/5/2018: Updated possible reflex testing.
6/12/2023: Updated control labeling requirements, edited specimen volume, included reference and link to strongly recommended patient information form.