Lab Dept: Hematology

Test Name: HEMOGLOBIN ELECTROPHORESIS CASCADE REFLEX

General Information

Lab Order Codes: MELP

Synonyms: Hemoglobin Electrophoresis Blood; Isoelectric Focusing

CPT Codes:
- 83020 – Hemoglobin fractionation and quantitation; electrophoresis
- 83021 – Hemoglobin fractionation and quantitation; chromatography
- 82664 – Electrophoresis, agar (if appropriate)
- 82664 x2 – Electrophoresis not elsewhere specified (if appropriate)
- 83068 - Unstable hemoglobin (if appropriate)
- 83789 – Hemoglobin variant by mass spectrophotometry (if appropriate)
- 88184 - Hemoglobin F, RBC distribution (if appropriate)
- 85660 – Sickling of red blood cells, reduction (if appropriate)
- 81257 – HBA1/HBA2, gene analysis for common deletions or variant (if appropriate)
- 81401 – HBB, common variants (if appropriate)
- 81403 – HBB, deletion/duplication analysis (if appropriate)

Testing includes: Level 1 Testing - Includes: Hemoglobin A2 and F and Hemoglobin electrophoresis.

Reflex Testing – Hemoglobin electrophoresis reflex testing performed at an additional charge, may include any or all of the following as indicated to identify rare hemoglobin variant(s) present: Hgb S Screen, Unstable Hgb, IEF confirms, Hgb variant by mass spec, Hgb F red cell distribution, beta-globin gene, large del/dup, alpha-globin gene sequencing, and beta-globin gene sequencing.

Logistics

Test Indications: Diagnose hemoglobinopathies; evaluate hemolytic anemia; diagnose thalassemia; evaluate sickling hemoglobins, hemoglobin C; with other specialized techniques; evaluate unstable, low affinity hemoglobinopathies. Evaluation of unexplained microcytosis.

Lab Testing Sections: Hematology - Sendouts

Referred to: Mayo Medical Laboratories (MML Test: HBELC)

Phone Numbers: MIN Lab: 612-813-6280

STP Lab: 651-220-6550
Test Availability: Daily, 24 hours

Turnaround Time: 1 – 25 days (longer if structural studies are required), performed Monday – Saturday

Special Instructions: A Thalassemia/Hemoglobinopathy Information Sheet (available from lab) may be completed and forwarded with the specimen. Include recent transfusion history.

Specimen

Specimen Type: Whole blood

Container: Lavender (EDTA) top tube

Draw Volume: 10 mL (Minimum: 1 mL) blood

Processed Volume: Same as Draw Volume.

Collection: Routine venipuncture

Special Processing: Lab Staff: Do Not centrifuge. Specimen should remain in original collection container. Do not freeze. Send refrigerated.

Patient Preparation: None

Sample Rejection: Testing cannot be performed on clotted samples; frozen specimens; mislabeled or unlabeled specimens

Interpretive

Reference Range: | LEVEL 1 | Hgb A | 1 - 30 days: | 5.9 – 77.2% |
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<th></th>
<th>1 – 2 months:</th>
<th>3 – 5 months:</th>
<th>6 – 8 months:</th>
<th>9 – 12 months:</th>
<th>13 – 17 months:</th>
<th>18 – 23 months:</th>
<th>&gt; or = 24 months:</th>
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<tbody>
<tr>
<td><strong>Hgb A₂</strong></td>
<td>7.9 – 92.4%</td>
<td>54.7 – 97.1%</td>
<td>80.0 – 98.0%</td>
<td>86.2 – 98.0%</td>
<td>88.8 – 98.0%</td>
<td>90.4 – 98.0%</td>
<td>95.8 – 98.0%</td>
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<tr>
<td><strong>Hgb F</strong></td>
<td>0.0 – 2.1%</td>
<td>0.0 – 2.6%</td>
<td>1.3 – 3.1%</td>
<td>0.0 – 2.6%</td>
<td>1.6 – 42.2%</td>
<td>0.0 – 16.7%</td>
<td>0.0 – 0.9%</td>
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<tr>
<td><strong>Reflexes:</strong></td>
<td><strong>Hemoglobin F, Red Cell Distribution</strong></td>
<td><strong>Reported as heterogeneous or homogenous</strong></td>
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<td></td>
<td><strong>IEF Confirmation</strong></td>
<td><strong>Noted when performed</strong></td>
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Hemoglobin, Unstable

Normal (reported as normal [stable] or abnormal [unstable])

Hemoglobin Variant by Mass Spec

Noted when performed

Hemoglobin S, Scrn

Negative

Hemoglobin ELP, Molecular

Noted when performed. May include Alpha Globin Gene Sequence, Beta Globin Gene Sequence, Beta Globin Del/Dup

**Critical Values:**

N/A

**Limitations:**

Blood transfusion prior to hemoglobin electrophoresis may make interpretations inconsistent.

Alpha-thalassemias with only 1 or 2 alpha-globin gene deletions are not recognized by this testing protocol. Alpha-globin gene analysis is required to identify 1 or 2 globin genes deleted.

**Methodology:**

Hemoglobin A2 and F: Cation Exchange/HPLC
Hemoglobin Electrophoresis: Capillary Electrophoresis
Hemoglobin S: Hemoglobin S Solubility
Unstable Hemoglobin: Isopropanol Stability
Hgb F, Red Cell Distribution: Flow Cytometry
Hgb Variant by Mass Spec: Mass Spectrophotometry (MS)
Hgb ELP, Molecular: Polymerase Chain Reaction (PCR) Analysis/Multiplex Ligation-Dependent Probe Amplification (MLPA), Polymerase Chain Reaction (PCR)/DNA Sequencing
IEF Confirms: Isoelectric Focusing

**References:**

[Mayo Medical Laboratories Lab Web Page](https://www.mayomedicallaboratories.com) August 2015

**Updates:**

1/11/2007: CPT 2007 updates
4/21/2009: Addition of Level 3 testing, additional charging/CPT’s
1/25/2011: Level 2 testing now direct reflex per test. Updated reference ranges for pediatrics.
2/12/2013: CPT update