
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)
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)
81259 – Alpha globin gene sequencing (if appropriate)
81364 – Beta globin gene sequencing (if appropriate)
81363 – Beta globin cluster locus deletion/duplication (if appropriate)
81479 – Gamma globin full gene sequencing (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, alpha globin analysis, beta-globin gene sequencing, beta globin cluster locus deletion/duplication, alpha-globin gene sequencing, and gamma globulin full gene sequencing.

Logistics

Test Indications: Diagnose thalassemias and hemoglobin variants. 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, performed Monday – Saturday

Special Instructions: A Thalassemia/Hemoglobinopathy Information Sheet (available from lab-Mayo Supply T576) may be completed and forwarded with the specimen. Include recent transfusion history.

Specimen

Specimen Type: Whole blood

Container: Lavender (EDTA) top tube
Alternate: ACD (Yellow solution B), Green (NaHep)

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

Processed Volume: Same as Draw Volume.

Collection: Routine blood collection

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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		1 – 2 months:	7.9 – 92.4%
		3 – 5 months:	54.7 – 97.1%
		6 – 8 months:	80.0 – 98.0%
		9 – 12 months:	86.2 – 98.0%
		13 – 17 months:	88.8 – 98.0%
		18 – 23 months:	90.4 – 98.0%
		> or = 24 months:	95.8 – 98.0%
	Hgb A₂	1 - 30 days:	0.0 – 2.1%
		1 – 2 months:	0.0 – 2.6%
		3 – 5 months:	1.3 – 3.1%
		> or = 6 months:	2.0 – 3.3%
	Hgb F	1 – 30 days:	22.8 – 92.0%
		1 – 2 months:	7.6 – 89.8%
		3 – 5 months:	1.6 – 42.2%
		6 – 8 months:	0.0 – 16.7%
		9 – 12 months:	0.0 – 10.5%
		13 – 17 months:	0.0 – 7.9%
		18 – 23 months:	0.0 – 6.3%
		>or = 24 months:	0.0 – 0.9%
	Variants	No abnormal variants	
Reflexes:	Hemoglobin F, Red Cell Distribution	Reported as heterogeneous or homogenous	
	IEF Confirmation	Noted when performed	

	Hemoglobin, Unstable	Normal (reported as normal [stable] or abnormal [unstable])
	Hemoglobin Variant by Mass Spec	Noted when performed
	Hemoglobin S, Scrn	Negative
	Alpha Globin Gene Analysis	Interpretive report
	Beta Globin Gene Sequencing	Interpretive report
	Beta Globin Cluster Locus Del/Dup	Interpretive report
	Gamma Globulin Full Gene Sequencing	Interpretive report

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)
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](#) February 2018

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

3/5/2018: Updated reflex testing