Overview

Useful For
Monitoring patients with sickling disorders who have received hydroxyurea or transfusion therapy

Testing Algorithm
See Benign Hematology Evaluation Comparison in Special Instructions.

Special Instructions
- Thalassemia/Hemoglobinopathy Patient Information
- Benign Hematology Evaluation Comparison

Method Name
Capillary Electrophoresis

NY State Available
Yes

Specimen

Specimen Type
Whole Blood EDTA

Advisory Information
This test is intended for monitoring purposes, such as the increase in hemoglobin F (Hb F) after therapy, or the levels of hemoglobin variants after transfusion. The HPFH / Hemoglobin F, Red Cell Distribution, Blood test is a flow cytometry assay that determines the distribution of Hb F within red blood cells.

If the patient has never been appropriately studied, hemoglobin electrophoresis is necessary (see HBEHC / Hemoglobin Electrophoresis Cascade, Blood).

Specimen Required

Container/Tube:
- Preferred: Lavender top (EDTA)
- Acceptable: ACD, heparin

Specimen Volume: 4 mL

Collection Instructions:
1. Submit fresh specimen.
2. Do not transfer blood to other containers.

Forms
1. Thalassemia/Hemoglobinopathy Patient Information (T358) in Special Instructions
2. If not ordering electronically, complete, print, and send a [Benign Hematology Test Request Form](#) (T755) with the specimen.

### Specimen Minimum Volume

1 mL

### Reject Due To

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### Specimen Stability Information

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<tr>
<th>Specimen Type</th>
<th>Temperature</th>
<th>Time</th>
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<tbody>
<tr>
<td>Whole Blood EDTA</td>
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<td>10 days</td>
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### Clinical and Interpretive

#### Clinical Information

The treatment of red blood cell sickling disorders may involve many therapeutic modalities. Two of the most important and beneficial are treatment with hydroxyurea and chronic transfusion therapy. Hydroxyurea causes elevation of hemoglobin F (Hb F) levels, and transfusion serves to lower the percentage of hemoglobin S (Hb S). Both of these therapeutic modalities act to lessen the number and severity of sickling crises. Thus, periodic monitoring of Hb F and Hb S levels are needed to guide further therapy.

#### Reference Values

##### HEMOGLOBIN A

- 1-30 days: 5.9-77.2%
- 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%

##### HEMOGLOBIN A2

- 1-30 days: 0.0-2.1%
- 1-2 months: 0.0-2.6%
Test Definition: HGBCE
Hb Variant, A2 and F Quantitation,B

3-5 months: 1.3-3.1%
> or =6 months: 2.0-3.3%

HEMOGLOBIN 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%

VARIANT 1
0.0
VARIANT 2
0.0
VARIANT 3
0.0

Interpretation
Clinically, optimal levels of hemoglobin S (Hb S) and hemoglobin F (Hb F) are patient specific and depend on a number of factors including response to therapy. This test will be performed by capillary electrophoresis and any variant present will be reported as their zone only, including Hb S. No confirmatory functional study such as sickle solubility will be performed. Information reported: Percentages of hemoglobin A (Hb A), hemoglobin A2 (Hb A2), Hb F and any variant present. Variants will be reported as zones and are not specific, even if present in Z5 (Zone S). If the identity of the variant has not been previously confirmed, diagnostic hemoglobin electrophoresis is necessary (see HBELC / Hemoglobin Electrophoresis Cascade, Blood).

Cautions
Peaks present in zones Z9, Z7, Z6, Z5, Z4, Z3, and Z2 - recently labeled the Z(A), Z(F), Z(D), Z(S), Z(E), Z(A2), and Z(C) zones, respectively - may not represent the hemoglobin fractions the zones are named after as other variants can migrate to these positions, including the F, A, and A2 positions.

This test is not intended for diagnostic purposes; thus, it is assumed the patient's diagnosis is established.

Clinical Reference
Heart, Lung, and Body Institute, 2002


**Performance**

**Method Description**

The CAPILLARYS System is an automated system that uses capillary electrophoresis (CE) to separate charged molecules by their electrophoretic mobility in an alkaline buffer. Separation occurs according to the electrolyte pH and electro-osmotic flow. A sample dilution with hemolysing solution is injected by aspiration. A high voltage protein separation occurs and direct detection of the hemoglobin protein fractions is at 415 nm, which is specific to hemoglobins. The resulting electrophoregram peaks are evaluated for pattern abnormalities and are quantified as a percentage of the total hemoglobin present. CE is an alkaline electrophoresis method with relative migrations similar to alkaline gel electrophoresis, although hemoglobin A2 (Hb A2) elutes first and hemoglobin H (Hb H) elutes last, unlike the more traditional methods. The data tracing is organized into 300 equally spaced sections with the anionic variants on the left and the cationic hemoglobins on the right. For diagnostic purposes, the overall schematic has been grouped into 15 unequal zones (Z) numbered from right to left with zones Z9, Z7, Z6, Z5, Z4, Z3 and Z2 - relabeled as Z(A), Z(F), Z(D), Z(S), Z(E), Z(A2) and Z(C) zones, respectively. Hemoglobin A (Hb A) and Hb A2 are used as internal standards and are assigned the numerical positions 150 and 243, respectively. (Louahabi A, Philippe M, et al: Evaluation of a new Sebia kit for analysis of hemoglobin fractions and variants on the Capillarys system. Clin Chem Lab Med 2006;44[3]:340-345)

**PDF Report**

No

**Day(s) and Time(s) Test Performed**

Monday through Saturday; 7 a.m. and 1 p.m.

**Analytic Time**

Same day/1 day

**Maximum Laboratory Time**

2 days

**Specimen Retention Time**

7 days
Performing Laboratory Location
Rochester

Fees and Codes

Fees
- Authorized users can sign in to Test Prices for detailed fee information.
- Clients without access to Test Prices can contact Customer Service 24 hours a day, seven days a week.
- Prospective clients should contact their Regional Manager. For assistance, contact Customer Service.

Test Classification
This test has been modified from the manufacturer's instructions. Its performance characteristics were determined by Mayo Clinic in a manner consistent with CLIA requirements. This test has not been cleared or approved by the U.S. Food and Drug Administration.

CPT Code Information
83020-Quantitation by Electrophoresis

LOINC® Information

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