MAYO CLINIC LABORATORIES

Test Definition: NHEP

Hereditary Erythrocytosis Gene Panel,
Next-Generation Sequencing, Varies

Reporting Title: Erythrocytosis Full Panel, NGS
Performing Location: Mayo Clinic Laboratories - Rochester Main Campus

Ordering Guidance:

Polycythemia vera should be excluded prior to testing as it is much more common than hereditary erythrocytosis and can be present even in young patients. A *JAK2* V617F or *JAK2* exon 12 variant should not be present. More sensitive, variant-specific testing for *JAK2* V617F is highly recommended prior to ordering this test. Additionally, alpha and beta chain high-oxygen affinity hemoglobin variants should be excluded prior to ordering this test panel.

See Erythrocytosis Genotyping Comparison Chart for a comparison of erythrocytosis testing options. If this test is ordered in the setting of erythrocytosis and suspicion of polycythemia vera, interpretation requires correlation with a concurrent or recent bone marrow evaluation.

Recommended Testing for *JAK2* negative lifelong or familial elevated hemoglobin levels:
Tier 1: REVE2 / Erythrocytosis Evaluation, Blood
Tier 2: NHEP / Hereditary Erythrocytosis Gene Panel, Next-Generation Sequencing, Varies

This comprehensive panel (NHEP) assesses 24 genes and includes deletion/duplication analysis. It is recommended for most patients with idiopathic erythrocytosis because hereditary erythrocytosis (HE) can be associated with novel variants with low incidence.

For an evaluation including hemoglobin electrophoresis testing and a Sanger sequencing panel of hereditary erythrocytosis variant analysis of the most common gene regions associated with hereditary erythrocytosis in an algorithmic fashion, order REVE2.

The hemoglobin genes, *HBA1*/*HBA2* and *HBB* are not interrogated in this assay.

Multiple gene panels are available. For more information see Hereditary Erythrocytosis Gene Panel and Subpanel Comparison.

Upon request and after initial testing is complete, WESPR / Panel to Whole Exome Sequencing Reflex Test, Varies may be added to this test. To obtain more information about this option or add WESPR testing, call 800-533-1710.

Targeted testing for familial variants (also called site-specific or known variants testing) is available for the genes on this panel. See FMTT / Familial Variant, Targeted Testing, Varies. To obtain more information about this testing option, call 800-533-1710.

Shipping Instructions:

Necessary Information:

1. Erythrocytosis Patient Information is strongly recommended but not required. Testing may proceed without the patient information; however, it aids in providing a more thorough interpretation. Ordering healthcare professionals are strongly encouraged to complete the form and send it with the specimen
2. If form is not provided, include the following information with the test request: clinical diagnosis, pertinent clinical

history (ie, complete blood cell count results and relevant clinical notes), and differentials based on any previous bone marrow studies, clinical or morphologic presentation.

Specimen Requirements:

Submit only 1 of the following specimens:

Specimen Type: Whole blood
Patient Preparation: A previous bone marrow transplant from an allogenic donor will interfere with whole blood testing. For information about testing patients who have received a bone marrow transplant, call 800-533-1710.
Container/Tube:
Preferred: Lavender top (EDTA)
Acceptable: Yellow top (ACD)
Specimen Volume: 3 mL
Collection Instructions:
1. Invert several times to mix blood.
2. Send whole blood specimen in original tube. **Do not aliquot.**
Specimen Stability Information: Ambient (preferred) 4 days/Refrigerated 4 days
Additional Information: To ensure minimum volume and concentration of DNA are met, the requested volume must be submitted. Testing may be canceled if DNA requirements are inadequate.

Specimen Type: Skin biopsy
Supplies: Fibroblast Biopsy Transport Media (T115)
Container/Tube: Sterile container with any standard cell culture media (eg, minimal essential media, RPMI 1640). The solution should be supplemented with 1% penicillin and streptomycin.
Specimen Volume: 4-mm punch
Specimen Stability Information: Refrigerated (preferred) < 24 hours/Ambient < 24 hours
Additional Information:
1. Specimens are preferred to be received within 24 hours of collection. Culture and extraction will be attempted for specimens received after 24 hours and will be evaluated to determine if testing may proceed.
2. A separate culture charge will be assessed under CULFB / Fibroblast Culture for Biochemical or Molecular Testing. An additional 3 to 4 weeks are required to culture fibroblasts before genetic testing can occur.

Specimen Type: Cultured fibroblast
Container/Tube: T-25 flask
Specimen Volume: 2 Flasks
Collection Instructions: Submit confluent cultured fibroblast cells from a skin biopsy from another laboratory. Cultured cells from a prenatal specimen will not be accepted.
Specimen Stability Information: Ambient (preferred) < 24 hours/Refrigerated <24 hours
Additional Information:
1. Specimens are preferred to be received within 24 hours of collection. Culture and extraction will be attempted for specimens received after 24 hours and will be evaluated to determine if testing may proceed.
2. A separate culture charge will be assessed under CULFB / Fibroblast Culture for Biochemical or Molecular Testing. An additional 3 to 4 weeks are required to culture fibroblasts before genetic testing can occur.

Test Definition: NHEP

Hereditary Erythrocytosis Gene Panel, Next-Generation Sequencing, Varies

Forms:

1. New York Clients-Informed consent is required. Document on the request form or electronic order that a copy is on file. The following documents are available:
-Informed Consent for Genetic Testing (T576)
-Informed Consent for Genetic Testing (Spanish) (T826)
2. Erythrocytosis Patient Information (T694)
3. If not ordering electronically, complete, print, and send a Benign Hematology Test Request (T755) with the specimen.

Specimen Type	Temperature	Time	Special Container
Varies	Varies		

Result Codes:

Result ID	Reporting Name	Type	Unit	LOINC®
619020	Test Description	Alphanumeric		62364-5
619021	Specimen	Alphanumeric		31208-2
619022	Source	Alphanumeric		31208-2
619023	Result Summary	Alphanumeric		50397-9
619024	Result	Alphanumeric		82939-0
619025	Interpretation	Alphanumeric		59465-5
619026	Additional Results	Alphanumeric		82939-0
619027	Resources	Alphanumeric		99622-3
619028	Additional Information	Alphanumeric		48767-8
619029	Method	Alphanumeric		85069-3
619030	Genes Analyzed	Alphanumeric		82939-0
619031	Disclaimer	Alphanumeric		62364-5
619032	Released By	Alphanumeric		18771-6

LOINC® and CPT codes are provided by the performing laboratory.

Supplemental Report:

Supplemental

CPT Code Information:

81404
81405
81479
81479 (if appropriate for government payers)

Reflex Tests:

Test Id	Reporting Name	CPT Units	CPT Code	Always Performed	Available Separately

CULFB	Fibroblast Culture for Genetic Test	1	88233	No	Yes

Result Codes for Reflex Tests:

Test ID	Result ID	Reporting Name	Type	Unit	LOINC®
CULFB	52327	Result Summary	Alphanumeric		50397-9
CULFB	52329	Interpretation	Alphanumeric		69965-2
CULFB	52328	Result	Alphanumeric		82939-0
CULFB	CG770	Reason for Referral	Alphanumeric		42349-1
CULFB	CG899	Specimen	Alphanumeric		31208-2
CULFB	52331	Source	Alphanumeric		31208-2
CULFB	52332	Method	Alphanumeric		85069-3
CULFB	54625	Additional Information	Alphanumeric		48767-8
CULFB	52333	Released By	Alphanumeric		18771-6

Reference Values:

An interpretive report will be provided.