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**Lab Dept:** Hematology

**Test Name:** PROTOPORPHYRINS, FRACTIONATION,  
WHOLE BLOOD

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***General Information***

**Lab Order Codes:** PFE

**Synonyms:** EPP (Erythropoietic Protoporphyrin); Erythrocyte Protoporphyria; FEP; Free Protoporphyrin; Zinc Protoporphyrin; Protoporphyrins, Free and Zinc Complexed, Erythrocytes

**CPT Codes:** 84542 – Column includes mass spectrometry, if performed, none drug analyte(s) not elsewhere specified, qualitative or quantitative, each specimen

**Test Includes:** Quantitation of zinc protoporphyrins and free protoporphyrins reported in ug/dL packed cells.

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***Logistics***

**Test Indications:** Establishing a biochemical diagnosis of EPP. Differential diagnosis of chronic intoxication from any of a variety of causes. Differential diagnosis in some cases of iron-deficiency anemia.

Zinc-complexed protoporphyrin can be increased in erythrocytes in association with:

- Iron deficiency anemia (the most common cause of elevated zinc protoporphyrin)
- Chronic intoxication by heavy metals (ie, lead) or various organic chemicals

• Hepatoerythropoietic porphyria Noncomplexed (free) protoporphyrin is increased disproportionately in erythrocytes in cases of Erythropoietic Protoporphyria (EPP)

**Lab Testing Sections:** Hematology - Sendouts

**Referred to:** Mayo Medical Laboratories (MML Test: PPF)

**Phone Numbers:** MIN Lab: 612-813-6280

STP Lab: 651-220-6550

**Test Availability:** Daily, 24 hours

**Turnaround Time:** 2 – 3 days, test set-up Monday – Friday at 8am

**Special Instructions:** See [Patient Preparation](#)

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***Specimen***

**Specimen Type:** Whole blood

**Container:** Green top (Na Heparin) tube  
Alternate: Dark blue (metal-free heparin) or Green (Lithium Heparin)

**Draw Volume:** 5 mL (Minimum: 3 mL) whole blood, full tube preferred

**Processed Volume:** Same as Draw Volume

**Collection:** Routine collection, immediately place specimen on wet ice

**Special Processing:** Lab Staff: **Do Not** centrifuge. Specimen should be stored and shipped in original collection container at refrigerated temperatures and must reach Mayo within 72 hours. Specimen must not be frozen.

**Patient Preparation:** Fasting patient specimen preferred (12 hour fast). Water may be taken as necessary, but no other liquids. Patient should abstain from alcohol for 24 hours.

**Sample Rejection:** Sample collected in the wrong tube; mild/gross hemolysis; specimen improperly handled; frozen; unlabeled or mislabeled specimens

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***Interpretive***

**Reference Range:**

Free Protoporphyrin: <20 mcg/dL packed cells
Zinc-complexed Protoporphyrin: <60 mcg/dL packed cells
<b>Interpretation:</b> Values of zinc-complexed protoporphyrin >60 ug/dL suggest iron deficiency anemia or may indicate chronic intoxication by heavy metals or organic chemicals. A predominance of noncomplexed (free) protoporphyrin indicates a diagnosis of EPP.
<b>Note:</b> Apparently healthy persons may have erythrocyte total protoporphyrin concentrations >60 ug/dL. Such persons should be suspected of having metabolic problems or mild intoxication by environmental pollutants. Values for total protoporphyrin >75 ug/dL are likely to indicate the existence of metabolic or intoxication problems.

**Critical Values:** N/A

**Limitations:** Abstinence from alcohol is essential for at least 24 hours. It is essential to proceed expeditiously with obtaining, processing, and dispatching the specimen, following precisely procedures specified above, paying special heed to maintaining appropriate temperatures for the specimen.

**Methodology:** High-Performance Liquid Chromatography (HPLC) with Fluorescence Detection. Includes separate quantitation of zinc protoporphyrins and free protoporphyrins.

**References:** Harmening DH (1997) Clinical Hematology and Fundamentals of Hemostasis, 3<sup>rd</sup> ed

[Mayo Medical Laboratories Web Page](#) February 2018

**Updates:**

- 3/2/2004: Test moved from Quest Diagnostics to Mayo Medical Laboratories.
- 1/11/2010: MML no longer accepts specimens submitted as washed erythrocytes. All washing of cells will be done at MML. Specimens should be submitted as whole blood.
- 7/7/2015: Tube type update and reference range update.
- 1/14/2016: Remove metal free tube type
- 1/28/2016: CPT update
- 2/1/2018: Collection container update