

## Overview

### Useful For

Assessment of in vivo lipid peroxidation

Considered to be an index of systemic oxidative stress over time

### Additional Tests

Test Id	Reporting Name	Available Separately	Always Performed
CRETR	Creatinine, Random, U	No	Yes

### Testing Algorithm

When F2-isoprostanes testing is performed, urine creatinine will always be performed at an additional charge.

### Method Name

F2ISO: Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS)

CRETR: Enzymatic Colorimetric Assay

### NY State Available

Yes

## Specimen

### Specimen Type

Urine

### Specimen Required

**Patient Preparation:** Patient should not take nonsteroidal anti-inflammatory drugs within the 72 hours or aspirin within the 2 weeks prior to specimen collection.

**Supplies:** Sarstedt 5 mL Aliquot Tube (T914)

**Container/Tube:** Plastic urine tube

**Specimen Volume:** 5 mL

#### Collection Instructions:

1. Collect a random urine specimen.
2. No preservative.

### Forms

If not ordering electronically, complete, print, and send a [Cardiovascular Test Request Form](#) (T724) with the specimen.

### Specimen Minimum Volume

1 mL

**Reject Due To**

All specimens will be evaluated at Mayo Clinic Laboratories for test suitability.

**Specimen Stability Information**

Specimen Type	Temperature	Time	Special Container
Urine	Refrigerated (preferred)	7 days	
	Ambient	7 days	
	Frozen	30 days	

**Clinical & Interpretive****Clinical Information**

Oxidative stress results from an imbalance of reactive oxygen species resulting in peroxidation of biomolecules. 15-F<sub>2t</sub>-isoprostane (F2ISO, also referred to as 8-iso-PGF<sub>2</sub>α or 8-isoprostane) is an F<sub>2</sub>-isoprostane and its measurement is considered the "gold standard" test for quantifying lipid peroxidation in vivo. F2ISO is a potent vasoconstrictor, induces vascular smooth muscle cell proliferation, and increased aspirin resistance to platelet aggregation. Elevated urinary F2ISO concentrations are associated with the presence and extent of coronary artery stenosis, peripheral artery disease, and increased risk of post-operative atrial fibrillation.

Urinary F2ISO concentrations are lowered by aerobic exercise training, smoking cessation, and fenofibrate therapy.

**Reference Values**

> or =18 years: < or =1.0 ng/mg creatinine

Reference values have not been established for patients who are younger than 18 years of age

**Interpretation**

Elevated urinary F<sub>2</sub>-isoprostanes reflect widespread oxidative stress and systemic burden of lipid peroxidation end products. Quantitation of F<sub>2</sub>-isoprostanes in urine is highly dependent upon the methodology utilized; however, mass spectrometry methods (gas chromatography-mass spectrometry or liquid chromatography-tandem mass spectrometry) assays yield superior sensitivity and analytical specificity compared with immunoassays.

F<sub>2</sub>-isoprostanes demonstrate superior clinical sensitivity compared to other oxidative stress biomarkers but lack clinical specificity for any particular disease. Pharmacological treatment with antioxidant supplementation, hypoglycemic agents in diabetes, smoking cessation, and weight reduction have all been shown to decrease production of F<sub>2</sub>-isoprostanes.

**Cautions**

For the most accurate assessment of lipid oxidation status, individuals should not be on aspirin or other nonsteroidal anti-inflammatory drugs, have smoked, or have had acute changes in statin mono- or combination therapies.

Patients should not take nonsteroidal anti-inflammatory drugs within 72 hours or aspirin within 2 weeks prior to providing a urine specimen for analysis.

**Clinical Reference**

1. Strobel NA, Fassett RG, Marsh SA, Coombes JS. Oxidative stress biomarkers as predictors of cardiovascular disease. *Int J Cardiol.* 2011;147(2):191-201
2. Davies SS, Roberts, LJ. F2-isoprostanes as an indicator and risk factor for coronary heart disease. *Free Radic Biol Med.* 2011;50(5):559-566
3. Kontush A, de Faria EC, Chantepie S, Chapman MJ. A normotriglyceridemic, low HDL-cholesterol phenotype is characterized by an elevated oxidative stress and HDL particles with attenuated antioxidative activity. *Atherosclerosis.* 2005;182(2):277-285
4. Vassale C, Botto N, Andreassi MG, et al. Evidence for enhanced 8-isoprostane plasma levels, as an index of oxidative stress in vivo, for patients with coronary artery disease. *Coron Artery Dis.* 2003 May;14(3):213-218
5. Milne GL, Sanchez SC, Musiek, ES, Morrow JD. Quantification of F2-isoprostanes as a biomarker of oxidative stress. *Nature Prot.* 2007;2(1):221-226
6. Zhang Z. Systematic review on the association between F2-isoprostanes and cardiovascular disease. *Ann Clin Biochem.* 2013;50(Pt 2):108-114
7. Wu J, Marchioli R, Silletta MG, et al. Oxidative stress biomarkers and the incidence of postoperative atrial fibrillation in the Omega-3 Fatty Acids for Prevention of Postoperative Atrial Fibrillation (OPERA) Trial. *J Am Heart Assoc.* 2015;4(5):e001886
8. Vazzana N, Ganci A, Cefalu AB, et al. Enhanced lipid peroxidation and platelet activation as potential contributors to increased cardiovascular risk in the low-HDL phenotype. *J Am Heart Assoc.* 2013;2(2):e000063

## Performance

### Method Description

15-F2t-Isoprostane is separated and quantified in urine by liquid chromatography-tandem mass spectrometry (LC-MS/MS).(Unpublished Mayo method)

### PDF Report

No

### Day(s) Performed

Tuesday

### Report Available

2 to 9 days

### Specimen Retention Time

7 days

### Performing Laboratory Location

Mayo Clinic Laboratories - Rochester Main Campus

## Fees & Codes

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**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 account representative. For assistance, contact [Customer Service](#).

**Test Classification**

This test was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. It has not been cleared or approved by the US Food and Drug Administration.

**CPT Code Information**

82542

**LOINC® Information**

Test ID	Test Order Name	Order LOINC® Value
F2ISO	F2-Isoprostanes, U	90783-2

Result ID	Test Result Name	Result LOINC® Value
88677	15-F2t-Isoprostane, U	90783-2