Test Definition: F2ISO

F2-Isoprostanes, Random, Urine

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-F2t-isoprostane (F2ISO, also referred to as 8-iso-PGF2alpha or 8-isoprostane) is an F2-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 F2-isoprostanes reflect widespread oxidative stress and systemic burden of lipid peroxidation end products. Quantitation of F2-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.

F2-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 F2-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

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