

Overview

Useful For

Screening for mast cell activation disorders including systemic mastocytosis

Highlights

2,3-Dinor-11beta-prostaglandin F2 alpha (2,3 BPG) is elevated in the urine of patients with systemic mastocytosis (SM).

2,3 BPG should be used as a screening test for systemic mastocytosis.

When 2,3 BPG is used in combination with urinary leukotriene E4 (LTE4) and N-methyl histamine (NMH), the sensitivity for SM detection increases to 90%.

Testing Algorithm

When this test is performed, urine creatinine will always be performed at no additional charge.

Special Instructions

- [Urine Preservatives-Collection and Transportation for 24-Hour Urine Specimens](#)

Method Name

23BPG: Liquid Chromatography-Tandem Mass Spectrometry (LC-MS/MS)

AACT: Enzymatic Colorimetric Assay

NY State Available

Yes

Specimen

Specimen Type

Urine

Specimen Required

Submit only 1 of the following specimens:

Patient Preparation: Patients taking aspirin or nonsteroidal anti-inflammatory drugs (NSAIDs) may have decreased concentrations of prostaglandin F2 alpha. If possible, discontinue for 2 weeks or 72 hours, respectively, prior to collecting a specimen.

Preferred: 24-hour urine collection

Supplies: Plastic, 5-mL tube (T465)

Specimen Volume: 4mL

Collection Instructions:

1. Collect urine for 24 hours.

2. Refrigerate specimen during collection, and send specimen refrigerated.

Additional Information: See [Urine Preservatives-Collection and Transportation for 24-Hour Urine Specimens](#) in Special Instructions for multiple collections.

Acceptable: Random collection

Supplies: Plastic, 5-mL tube (T465)

Specimen Volume: 4mL

Collection Instructions:

1. Collect a random urine specimen.
2. Refrigerate specimen after collection. Send specimen refrigerated or frozen; do not add any preservative.

Urine Preservative Collection Options

Note: The addition of preservative or application of temperature controls **must occur within 4 hours of completion** of the collection.

Ambient	No
Refrigerate	Preferred
Frozen	OK
50% Acetic Acid	OK
Boric Acid	OK
Diazolidinyl Urea	No
6M Hydrochloric Acid	No
6M Nitric Acid	No
Sodium Carbonate	OK
Thymol	No
Toluene	No

Specimen Minimum Volume

3 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)	14 days	

Specimen Type	Temperature	Time	Special Container
	Frozen	30 days	
	Ambient	8 hours	

Clinical and Interpretive

Clinical Information

2,3-Dinor-11beta-prostaglandin F2 alpha is the most abundant metabolic product of prostaglandins released by activated mast cells. Systemic mastocytosis (SM) is a disease in which clonally derived mast cells accumulate in peripheral tissues. Degranulation of these mast cells releases large amounts of histamines, prostaglandins, leukotrienes, and tryptase.

Â

The World Health Organization diagnostic criteria for SM require the presence of elevated mast cell counts on a bone marrow biopsy and 1 of the following minor criteria: abnormal mast cell morphology, *KIT* Asp816Val mutation, CD25-positive mast cells, or serum tryptase greater than 20 ng/mL. Alternatively, SM diagnosis can be made with the presence of 3 minor criteria in the absence of abnormal bone marrow studies.

Measurement of mast cell mediators in blood or urine is less invasive and is advised for the initial evaluation of suspected cases. Elevated levels of serum tryptase, urinary N-methylhistamine (NMH), 2,3-dinor-11beta-prostaglandin F2 alpha (2,3 BPG), or leukotriene E4 (LTE4) are consistent with the diagnosis of systemic mast cell disease.

Reference Values

<5,205 pg/mg creatinine

Interpretation

Urinary 2,3-dinor-11beta-prostaglandin F2 alpha (2,3-BPG) values above 3,263 pg/mg creatinine are consistent with, but not necessarily diagnostic of, systemic mastocytosis. Values should be interpreted in the context of clinical presentation and additional mast cell disease markers (serum tryptase, urinary N-methyl histamine, and/or urinary leukotriene E4).

Cautions

Elevated levels of 2,3-dinor-11beta-prostaglandin F2 alpha (2,3 BPG) in urine are not specific for systemic mast cell disease and may be found in patients with angioedema, diffuse urticaria, or myeloproliferative diseases in the absence of diffuse mast cell proliferation.Â

Systemic mast cell disease is a heterogeneous disease, and some patients may not have elevated (2,3 BPG) Â in urine.

Supportive Data

An internal study of 203 patients presenting with symptoms consistent with systemic mastocytosis found a receiver operating characteristic (ROC) area under the curve (AUC) of 0.62 for 2,3-dinor-11beta-prostaglandin F2 alpha (2,3 BPG) concentration discrimination for detection of systemic mastocytosis (SM)

Clinical Reference

1. Gotlib J, Pardanani A, Akin C, et al: International Working Group-Myeloproliferative Neoplasms Research and

Treatment (IWG-MRT) and European Competence Network on Mastocytosis (ECNM) consensus response criteria in advanced systemic mastocytosis. Blood 2013;121(13):2393-2401

2. Butterfield JH: Increased leukotriene E4 excretion in systemic mastocytosis. Prostaglandins Lipid Mediat 2010;92(1-4):73

3. Roberts LJ, Sweetman BJ, Lewis RA, et al: Increased production of prostaglandin D2 in patients with systemic mastocytosis. N Engl J Med 1980;303:1400-1404

4. Metcalfe DD: Mastocytosis syndromes. In Allergy Principles and Practice. Vol II. Fourth edition. Edited by E Middleton Jr, CE Reed, EF Ellis, et al. St. Louis, Mosby Yearbook Inc, 1993, pp 1537-1551

Performance

Method Description

2,3-Dinor-11beta-prostaglandin F2 alpha (2,3 BPG) is quantified in urine by liquid chromatography-tandem mass spectrometry (LC-MS/MS).(Unpublished Mayo method)

All 2,3 BPG concentrations are normalized to urine creatinine levels measured using a Roche Cobas enzymatic method.(Package insert: Roche Diagnostics, Indianapolis IN, 2004)

PDF Report

No

Day(s) and Time(s) Test Performed

Monday, Thursday; 11 a.m.

Analytic Time

2 days

Maximum Laboratory Time

6 days

Specimen Retention Time

14 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 was developed and its performance characteristics 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

84150

LOINC® Information

Test ID	Test Order Name	Order LOINC Value
23BPG	2,3-dinor 11B-Prostaglandin F2a, U	94381-1

Result ID	Test Result Name	Result LOINC Value
37931	2,3-dinor 11B-Prostaglandin F2a, U	94381-1