Galectin-3

CPT Code **82777***
Order Code **C315**
Specimen Type **EDTA Plasma or Serum**
Tube Type **Lavender Top or Tiger Top**

Disease states that may lead to increased galectin-3 release:

- Hypertension
- Subclinical myocardial injury
- Cardiovascular disease

Increased galectin-3 release results in:

- Cardiac fibrosis
- Adverse cardiac remodeling

Description

Galectin-3 is one of the most widely studied galectins, a family of soluble B-galactoside-binding lectins that play a regulatory role in inflammation.[1] Galectin-3 affects the synthesis of matrix compounds, such as type I collagen.[2] When cardiac tissue is injured, macrophages infiltrate the tissue and secrete galectin-3, which promotes collagen synthesis and ultimately leads to cardiac fibrosis and adverse cardiac remodeling.[3]

Galectin-3 is independent of, and complementary to natriuretic peptides, as they identify separate and distinct biological processes that contribute to development and progression of heart failure.[4-9] Galectin-3 is a mediator of cardiac fibrosis and adverse cardiac remodeling, whereas natriuretic peptides such as NT-proBNP or BNP, are released by cardiomyocytes in response to myocardial stretch.

Clinical Use

The Galectin-3 test may be used to help identify individuals at risk of future chronic heart failure due to hypertension.

Clinical Significance

- Elevated levels of galectin-3 in hypertensive individuals may suggest increased inflammation, collagen deposition, and fibrosis that can lead to adverse cardiac remodeling.[3]
- Galectin-3 levels may be used to guide the selection of medications in hypertensive individuals, as angiotensin-converting enzyme (ACE) inhibitors and angiotensin receptor blockers (ARBs) demonstrate reduction in left ventricular mass.[10]

Testing Frequency

Galectin-3 testing is determined by an individual's medical history, but may be performed semi-annually or annually as necessary. If the initial test result is abnormal, then follow-up testing may be performed within 3-6 months following treatment.

Specimen Type

The galectin-3 test can be performed on either an EDTA plasma or serum specimen. Fasting is not required.

Commercial Insurance or Medicare Coverage

Coverage guidelines, also known as NCD (National Coverage Determination) or LCD (Local Coverage Determination), have not been established or posted by CMS (Medicare & Medicaid). We have reviewed the larger Carriers (Aetna, United HealthCare, Cigna, Blues) and information has not been posted or is limited. Medical necessity and specificity of diagnosis should be provided when ordering this test.

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RELATIVE RISK

Galectin-3
(ng/mL)

<17.9 Low	17.9-25.9 Moderate	≥26.0 High

Treatment Considerations†

These treatment considerations are for educational purposes only. Specific treatment plans should be provided and reviewed by the treating practitioner.

✓ **Assess blood pressure.**

- If not at an optimal level, consider initiating or titrating antihypertensive therapy.[10,11]

✓ **Assess for heart failure.**[4-9,12,13]

- If heart failure is present or suspected, reference the American College of Cardiology/American Heart Association/Heart Failure Society of America (ACC/AHA/HFSA) guidelines for management of heart failure.[14]

Assess the presence of conditions associated with organ fibrosis, cancer, human anti-mouse antibodies or rheumatoid factor, or high levels of gamma globulins (>2.5 g/dL), as these may contribute to abnormal galectin-3 results.[15,16]

** The CPT codes provided are based on AMA guidelines and are for informational purposes only. CPT coding is the sole responsibility of the billing party. Please direct any questions regarding coding to the payer being billed.*

† The treatment considerations are provided for informational purposes only and are not intended as medical advice. A physician's test selection and interpretation, diagnosis, and patient management decisions should be based on his/her education, clinical expertise, and assessment of the patient.

References

1. Rubinstein N, Ilarregui JM, Toscano MA, Rabinovich GA. The role of galectins in the initiation, amplification and resolution of the inflammatory response. *Tissue Antigens*. 2004; 64: 1-12. 2. Sharma UC, Pokharel S, van Brakel TJ, et al. Galectin-3 marks activated macrophages in failure-prone hypertrophied hearts and contributes to cardiac dysfunction. *Circulation*. 2004; 110: 3121-3128. 3. de Boer RA, Yu L, van Veldhuisen DJ. Galectin-3 in cardiac remodeling and heart failure. *Curr Heart Fail Rep*. 2010; 7: 1-8. 4. Ho JE, Liu C, Lyass A, et al. Galectin-3 a Marker of Cardiac Fibrosis, Predicts Incident Heart Failure in the community. *J Am Coll Cardiol*. 2012; 60 (14): 1249-1256. 5. Yin Q-S, Shi B, Dong L, Bi L. Comparative study of galectin-3 and B-type natriuretic peptide as biomarkers for the diagnosis of heart failure. *J Geriatr Cardiol*. 2014; 11; 79-82. 6. Mueller T, Gegenhuber A, Leitner I. Diagnostic and prognostic accuracy of galectin-3 and soluble ST2 for acute heart failure. *Clin Chim Acta*. 2016; 463: 158-164. 7. van Vark LC, Lesman-Leegte I, Baart SJ, et al. Prognostic Value of Serial Galectin-3 Measurements in Patients With Acute Heart Failure. *J Am Heart Assoc*. 2017; 6; e003700. 8. Chow SL, Maisel AS, Anand I, et al. Role of Biomarkers for the Prevention, Assessment, and Management of Heart Failure: A Scientific Statement From the American Heart Association. *Circulation*. 2017; 135: e1054-e1091. 9. de Boer RA, Lok DJA, Jaarsma T, et al. Predictive value of plasma galectin-3 levels in heart failure with reduced and preserved ejection fraction. *Ann Med*. 2011; 43: 60-68. 10. Meredith PA, Östergren J. From hypertension to heart failure – are there better primary prevention strategies? *J Renin Angiotensin Aldosterone Syst*. 2006; 7: 64-73. 11. Dahlöf B, Devereux RB, Kjeldsen SE, et al. Cardiovascular morbidity and mortality in the Losartan Intervention For Endpoint reduction in hypertension study (LIFE): A randomized trial against atenolol. *Lancet*. 2002; 359: 1004-1010. 12. Yu X, Sun Y, Zhao Y, et al. Prognostic Value of Plasma Galectin-3 Levels in Patients With Coronary Heart Disease and Chronic Heart Failure. *Int Heart J*. 2015; 56; 314-318. 13. van der Velde AR, Gullestad L, Ueland T, et al. Prognostic Value of Changes in Galectin-3 Levels Over Time in Patients with Heart Failure: Data From CORONA and COACH. *Circ Heart Fail*. 2013; 6: 219-226. 14. Yancy CW, Jessup M, Bozkurt B., et al. 217 ACC/AHA/HFSA Focused Update of the 2013 ACCF/AHA Guideline for the Management of Heart Failure. *J Am Coll Cardiol*. 2017; 70 (6): 776-803. 15. Christenson RH, Duh S-H, Wu AHB, et al. Multi-center determination of galectin-3 assay performance characteristics: Anatomy of a novel assay for use in heart failure. *Clin Biochem*. 2010; 43: 683-690. 16. Enzyme-linked Immunosorbent Assay for the Quantitative Determination of Galectin-3 in Human Serum and Plasma. In: *BGM Galectin-3® REF #: 12836 US IVD BGM Galectin-3®* Kit. Waltham, MA: BG Medicine, Inc.; 2015: 1-35.

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