

Test Bulletin

CHF Risk Testing

BNP (B-Type Natriuretic Peptide) and proBNP

Benefits

- Rule out congestive heart failure (CHF) in symptomatic individuals
- Determine prognosis in individuals with CHF and other cardiac disease
- Track the course of CHF: values correlate with NYHA classification
- Help optimize treatment in individuals with heart failure

Clinical Summary

B-type, or brain, natriuretic peptide (BNP) was first isolated from brain tissue, but is synthesized primarily in the ventricles of the heart. Cleavage of the 108-amino acid precursor of BNP (proBNP) produces two molecules: (1) BNP, the active C-terminal, 77 to 108-amino acid molecule; and (2) N-terminal proBNP (NT-proBNP), the inactive 1 to 76-amino acid molecule. Studies indicate that NT-proBNP testing has the same clinical utility as BNP.^{1,2,3}

BNP increases glomerular filtration rate, decreases sodium retention, and inhibits renin and aldosterone secretion. It is a marker of cardiac dysfunction that correlates with the severity of symptomatic and asymptomatic left ventricular hypertrophy⁴ and CHF⁵ (including the NYHA classification⁶). Since NT-proBNP levels also correlate strongly with heart failure, either can be used to triage symptomatic patients (e.g., patients with dyspnea). For example, BNP can be used to differentiate cardiac failure from primary lung disease in patients with acute dyspnea⁷ and to indicate increased left ventricular mass in patients with essential hypertension.⁸ When levels are within the normal reference range, the patient's symptoms are probably not due to heart failure. Conversely, when levels are elevated, there is a high probability of heart failure and further cardiac assessment is warranted.

The degree of BNP or NT-proBNP elevation can be used to predict future cardiac events and survival. For example, BNP levels predicted heart failure and death after myocardial infarction.⁹ Similarly, the relative risk of death based on baseline NT-proBNP levels in patients presenting with chest pain and no ST-segment elevation was 4.2, 10.7, and 26.6 for NT-proBNP quartiles 2, 3, and 4, respectively (relative to the 1st quartile).¹⁰

If early studies are confirmed and clinical cut-points are established, these markers may assist in maximizing therapy. Troughton, et al showed improved treatment outcomes when a specific NT-proBNP level (<200 pmol/L) was used as the therapeutic target rather than clinical criteria.¹¹ Richards, et al showed that NT-proBNP levels above the median predicted response to carvedilol therapy in a group of patients with chronic ischemic (LV) dysfunction.¹²

Investigation into the utility of BNP testing for heart disease screening in a primary care setting (high-risk individuals and/or the general population) is also on-going.^{4,13}

Individuals Suitable for Testing

- Patients with suspected heart failure
- Patients with diagnosed heart failure

Reference Range

	BNP pg/mL	ProBNP pg/mL
Healthy males	≤ 33	≤ 60
Healthy females	≤ 50	12 - 150

Test Ordering Information

Test Name: BNP

Test Order Code:

CPT Code:* 83880

Specimen Requirements:

1 mL frozen EDTA plasma (lavender-top plastic tube); Do not use glass tubes or transfer pipettes.

For complete specimen requirements and other ordering information, contact your local Quest Diagnostics laboratory.

Test Ordering Information

Test Name: proBNP

Test Order Code:

CPT Code:* 83880

Specimen Requirements:

1 mL frozen EDTA plasma (lavender-top tube)

For complete specimen requirements and other ordering information, contact your local Quest Diagnostics laboratory.

Quest Diagnostics Incorporated



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Interpretive Information

Symptomatic patients who present with a BNP or NT-proBNP level within the normal reference range are highly unlikely to have CHF. Conversely, an elevated baseline level indicates the need for further cardiac assessment and indicates the patient is at increased risk for future heart failure and mortality.

BNP is increased in CHF, left ventricular hypertrophy, acute myocardial infarction, atrial fibrillation, cardiac amyloidosis, and essential hypertension. Elevations are also observed in right ventricular dysfunction, pulmonary hypertension, acute lung injury, subarachnoid hemorrhage, hypervolemic states, chronic renal failure, and cirrhosis.

NT-proBNP levels are increased in CHF, left ventricular dysfunction, myocardial infarction, valvular disease, hypertensive pregnancy, and renal failure, even after hemodialysis.

Although levels of BNP and NT-proBNP are similar in normal individuals, NT-proBNP levels are substantially greater than BNP levels in patients with cardiac disease due to increased stability (half-life) of NT-proBNP in circulation. Thus, results from the two tests are not interchangeable.

Cardiovascular Testing from Quest Diagnostics

Quest Diagnostics offers a comprehensive test menu consisting of over 80 lipid and non-lipid markers to meet your cardiovascular testing needs, including:

- **Cardiovascular risk assessment:** In addition to tests for established lipid markers, we offer tests for emerging lipid and non-lipid markers, including lipoprotein subfractions, Cardio CRP (high-sensitivity CRP), and Homocysteine;
- **Congestive heart failure:** We offer tests for B-type natriuretic peptide (BNP) and proBNP to rule out CHF and assist with disease management;
- **Hypertension:** Our unique Direct Renin Assay can be used for differentiating renin-mediated and sodium/volume hypertension, and for guiding drug selection based on the hypertension etiology.

REFERENCES

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