TEST ID: PBNP

NT-PRO B-TYPE NATRIURETIC PEPTIDE (BNP), SERUM

USEFUL FOR

An aid in the diagnosis of congestive heart failure

CLINICAL INFORMATION

B-type natriuretic peptide (brain natriuretic peptide: BNP) is a small, ringed peptide secreted by the heart to regulate blood pressure and fluid balance.\(^1\) This peptide is stored in and secreted predominantly from membrane granules in the heart ventricles in a pro form (proBNP). Once released from the heart in response to ventricle volume expansion and/or pressure overload, the N-terminal (NT) piece of 76 amino acids (NT-proBNP) is rapidly cleaved by the enzymes corin and/or furin to release the active 32 amino acid peptide (BNP).\(^2\)

Both BNP and NT-proBNP are markers of atrial and ventricular distension due to increased intracardiac pressure. The New York Heart Association (NYHA) developed a 4-stage functional classification system for congestive heart failure (CHF) based on the severity of the symptoms. Studies have demonstrated that the measured concentrations of circulating BNP and/or NT-proBNP increase with the severity of CHF based on the NYHA classification.

INTERPRETATION

< 50 years of age:

NT-proBNP values < 300 pg/mL have a 99% negative predictive value for excluding acute congestive heart failure (CHF). A cutoff of 1,200 pg/mL for patients with an eGFR < 60 yields a diagnostic sensitivity and specificity of 89% and 72% for acute CHF. NT-proBNP values > 450 pg/mL are consistent with CHF in adults under 50 years of age.

50-75 years of age:

NT-proBNP values < 300 pg/mL have a 99% negative predictive value for excluding acute CHF. A cutoff of 1,200 pg/mL for patients with an eGFR < 60 yields a diagnostic sensitivity and specificity of 89% and 72% for acute CHF. A diagnostic NT-proBNP cutoff of 900 pg/mL has been suggested in adults 50 to 75 years of age in the absence of renal failure.

> 75 years of age:

NT-proBNP values < 300 pg/mL have a 99% negative predictive value for excluding acute CHF. A cutoff of 1,200 pg/mL for patients with an eGFR < 60 yields a diagnostic sensitivity and specificity of 89% and 72% for acute CHF. A diagnostic NT-proBNP cutoff of 1,800 pg/mL has been suggested in adults over 75 years of age in the absence of renal failure.
NT-Pro BNP levels are loosely correlated with New York Heart Association (NYHA) functional class (see Table).

**SUPPORTIVE DATA**

The Roche NT-proBNP assay is automated and more precise than the Biosite BNP assay used previously. In addition, in vitro NT-proBNP is more stable than BNP.

**CLINICAL REFERENCE**


3. DeFilippi C, van Kimmenade R, Pinto YM: Amino-terminal pro-B-type natriuretic peptide testing in renal disease. Am J Cardiol 2008;101[suppl]:82A-88A

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### INTERPRETIVE LEVELS FOR CHF

<table>
<thead>
<tr>
<th>FUNCTIONAL CLASS</th>
<th>5TH TO 95TH PERCENTILE</th>
<th>MEDIAN</th>
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</thead>
<tbody>
<tr>
<td>I</td>
<td>31-1,110 pg/mL</td>
<td>377 pg/mL</td>
</tr>
<tr>
<td>II</td>
<td>55-4,975 pg/mL</td>
<td>1,223 pg/mL</td>
</tr>
<tr>
<td>III</td>
<td>77-26,916 pg/mL</td>
<td>3,130 pg/mL</td>
</tr>
<tr>
<td>IV</td>
<td>*</td>
<td>*</td>
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</tbody>
</table>

*In a Mayo Clinic study of 75 patients with CHF, only 4 were characterized as Class IV. Accordingly, range and median are not provided.*