

Division of Laboratory Medicine

Biochemistry

NT-proBNP

Pseudonyms: N-terminal-pro B-type natriuretic peptide

B-type natriuretic peptides (BNP) originate in the myocardial cells and are secreted in response to wall stress such as in heart failure. NT-proBNP is an inactive fragment released from the precursor of BNP as it is converted to active BNP. Measurement of NT-proBNP or BNP gives equivalent diagnostic information. NT-proBNP has greater stability so is preferred to BNP analysis.

NT-proBNP is an established diagnostic test for heart failure and its management. It has a very high diagnostic sensitivity for HF such that a normal result is useful for excluding its presence. High levels are associated with a poor prognosis and indicate the need for urgent referral and management. NT-proBNP elevation is a necessary condition for the diagnosis of HF with preserved systolic function and has some utility in the monitoring of treatment in a specialist setting.

General information

Collection container:

Adults – serum (with gel separator, 4.9mL brown top Sarstedt tube).

Paediatrics –lithium heparin plasma (1.2mL orange top Sarstedt tube, no gel separator).

Type and volume of sample:

The tubes should be thoroughly mixed before transport to the lab. 1mL whole blood is required as a minimum volume if only NT-proBNP is requested.

Specimen transport/special precautions:

Samples should not be taken from patients receiving therapy with high biotin doses (i.e. > 5 mg/day) until at least 8 hours following the last biotin administration.

Laboratory information

Method principle:

NT-proBNP is analysed on the automated instruments by a 2 site immunoassay with electrochemiluminescence detection.

Biological reference ranges:

Adults: Up to 400 pg/mL

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Paediatrics:	<u>pg/mL</u>
1 -11 months	37-646
1–1 years 11 months	39-413
2–5 years 11 months	23-289
6–13 years 11 months	22-157
14-17 years 11months	6-158

Neonates have higher values but ranges are not well defined.

Turnaround times:

Results will normally be available within 48 hours but 72 hours at the weekend. No urgent service will be provided as there is limited evidence of its value in as an urgent test.

A request can be added on for this test to a sample collected no older than 6 days.

Clinical information

Factors known to significantly affect the results:

Falsely low results can be seen in obese patients and patients treated with diuretics, beta-blockers, ACE inhibitors, angiotensin receptor antagonists and aldosterone antagonists. Such patients should be further evaluated by echocardiography if doubt remains.

NT-proBNP may be elevated in conditions other than heart failure including renal dysfunction with eGFR <60 ml/min, left ventricular hypertrophy, cardiac ischaemia, tachycardia, right ventricular overload, hypoxaemia and pulmonary embolism.

Clinical decision points:

NT-proBNP of <400 pg/mL in an untreated patient makes the diagnosis of heart failure unlikely.

Use of NT- pro-BNP in the management of suspected heart failure in adults:

Patients with a history of previous myocardial infarction should be urgently referred for transthoracic Doppler 2D echocardiography and specialist assessment within 2 weeks. Patients suspected of having HF but with no previous MI undergo NT-ProBNP testing with the following referral pathway:

- NT-proBNP >2000 pg/mL should be referred for transthoracic Doppler 2D echocardiography and specialist assessment within 2 weeks because such high levels carry a poor prognosis.
- NT-proBNP 400-2000 pg/mL should be referred for transthoracic Doppler 2D echocardiography and specialist assessment within 6 weeks.

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- NT-proBNP <400 pg/mL in an untreated patient makes heart failure unlikely.

Use of NT-pro-BNP by heart failure specialists in cardiology for the diagnosis of heart failure with impaired systolic ejection fraction and with preserved systolic ejection fraction. In patients suspected of having heart failure but in whom echocardiographic abnormalities are not evident, NT-proBNP should be performed to establish a diagnosis of heart failure with preserved left ventricular function if no test result is already available. Natriuretic peptides, including NT-proBNP cannot reliably distinguish between systolic and diastolic dysfunction.

Use NT-proBNP by heart failure specialists in cardiology for monitoring the treatment of heart failure. Monitoring of NT-proBNP may be useful in some patients where up-titration of their treatment has been problematic especially if they have been admitted to hospital. Reduction of NT-proBNP by >30% improves prognosis.

Other uses of natriuretic peptides are not covered by the NICE CG-108 guideline and should be discussed with Clinical Biochemistry consultant including its use in paediatrics.

References:

NICE Chronic Heart Failure in Adults: Management (CG108) August 2010
<https://www.nice.org.uk/guidance/cg108>

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