

## A brief guide to serum NT-pro BNP testing

### What is BNP?

B type Natriuretic Peptide (BNP) is one of several natriuretic peptides which are released when the heart is stretched or under pressure. They have a number of physiological roles, aiming to compensate for cardiac injury. Measurement of BNP and its degradation product N-Terminal proBNP can be used for the diagnosis and exclusion of heart failure.

### Why measure serum NTproBNP?

If the diagnosis of heart failure is uncertain then measurement of NTproBNP may help add extra information to the clinical history, examination and other initial tests (such as chest X-ray)

### What increases natriuretic peptides?

Many different cardiac and non-cardiac problems can cause an elevated serum NTproBNP – it is important to consider these before requesting. These may include:

Acute or chronic systolic or diastolic left and right heart failure, Valvular heart disease, LV hypertrophy with/without hypertension, Atrial fibrillation, Pulmonary embolism and severe pulmonary hypertension, Acute and chronic renal failure, Inflammatory cardiac disease, Advanced liver cirrhosis, Anaemia, Sepsis, Endocrine disorders such as Cushing's syndrome and severe neurological disease such as stroke or subarachnoid haemorrhage.

### When should I request it?

If a diagnosis of heart failure is being considered but a senior clinician (ideally registrar or consultant) remains uncertain despite the clinical and test information available already.

### When should I not request it?

1. For any diagnosis other than heart failure
2. For monitoring treatment of heart failure
3. Recent duplicate request - repeat requests within 6 months will be declined
4. If the diagnosis or exclusion of heart failure is already certain

### Is it accurate?

A low level of NTproBNP is excellent for the exclusion of heart failure and suggests that heart failure is very unlikely and investigations should be focussed elsewhere. A high value needs to be interpreted in the clinical context and may require further investigation with cardiac imaging (mainly echocardiography) to confirm.

### What is the normal value?

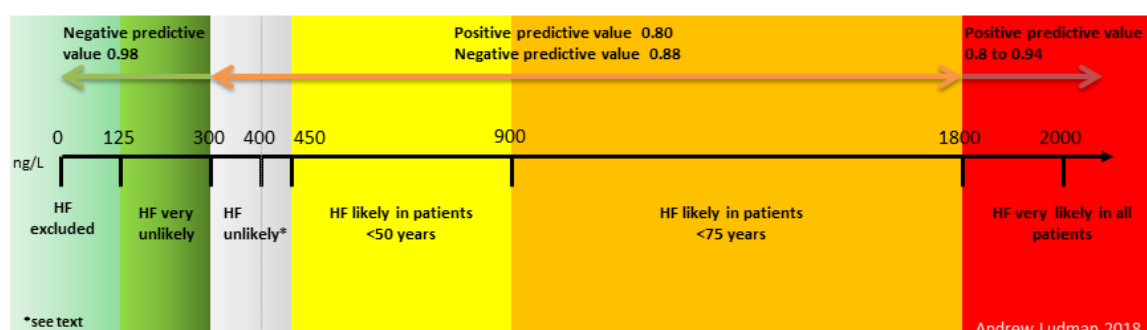
The 2014 NICE Acute Heart Failure Guideline recommends that in people presenting with new suspected acute heart failure that a single measurement of NTproBNP be made and that a level of less than 300ng/litre excludes the diagnosis.

A value of less than 400ng/litre is also likely to exclude the diagnosis of heart failure in the majority of people.

Higher values are sometimes more difficult to interpret and it is common for elderly people with hypertension, atrial fibrillation and renal dysfunction to have an elevated NTproBNP.

The figure below gives some values which try to account for age:

Interpreting NTproBNP results in people with suspected acute heart failure, no other clear cause for symptoms and 'normal' renal function for age



### If the NTproBNP is raised do I always need to request an echocardiogram?

No. Think about how high the value is and other potential clinical causes. However if you think heart failure is now likely this does need to be confirmed by echocardiography in most cases. \*In young people, or those already treated with diuretics or ACE-I/ARB/MRA, have a slightly lower threshold to consider echocardiography as levels of NTproBNP may be lower in these patients.

### If I think that an echo is now needed does it always need to be as an inpatient?

No. This is still based on clinical judgement. Ideally echocardiography is recommended within 48hrs of an admission with heart failure but outpatient investigation and treatment may still be appropriate particularly if there are limited symptoms or only mildly raised levels.

### Can the NTproBNP differentiate between different types of heart failure?

No. Imaging with echocardiography is almost always needed to determine the structural cause of heart failure symptoms and signs.

**Do all patients with a raised NTproBNP need to be referred to cardiology?**

No. A raised NTproBNP may have many causes which can be expertly investigated and managed by acute and general physicians. Patients identified as having heart failure should be treated according to national and local guidelines – if requiring admission then please refer to the Heart Failure service (via the Whiteboard).

**Does a normal NTproBNP mean the heart is completely normal?**

No. An NTproBNP may not be raised in many cardiac pathologies which may merit investigation. NTproBNP should only be tested and used to assist in the diagnosis of heart failure.

**Can I request an NTproBNP on everyone?**

No. The cost is ~£17.50 per test (CRP for comparison is ~£0.35 and is considered expensive). Excessive use will be audited and potentially recharged to the requesting department. Think carefully if it will change your management.

**How do I request it?**

Serum NTproBNP will be available via Medway orders or paper request if necessary with the results available on an urgent basis 7 days a week.

**Resources and Further Reading:**

- 2012 Recommendations for the use of natriuretic peptides in acute cardiac care. Thygesen et al. European Heart Journal (2012) 33, 2001–2006 (doi:10.1093/eurheartj/ehq509).
- 2014 Acute heart failure: diagnosing and managing acute heart failure in adults (clinical guideline 187).
- 2015 The diagnostic accuracy of the natriuretic peptides in heart failure: systematic review and diagnostic meta-analysis in the acute care setting. Roberts E, Ludman AJ et al. BMJ 2015; 350 doi:10.1136/bmj.h910.
- 2018 Chronic heart failure in adults: diagnosis and management (NICE guideline 106).