



Understanding our advice ~ *May 2005*

# The use of B-type natriuretic peptides in the investigation of patients with suspected heart failure

## Purpose of this document

NHS Quality Improvement Scotland (NHS QIS) has issued advice to **NHSScotland** on B-type natriuretic peptide testing for patients with suspected heart failure.

B-type natriuretic tests are simple blood tests that can help establish if someone has heart failure.

We have advised that B-type natriuretic peptide testing should be more widely available as a test for people who have suspected heart failure and we describe the circumstances in which it should be used in NHSScotland.

This booklet has been produced to explain our advice on B-type natriuretic peptide testing to people who do not have specialist knowledge in this area.

It explains what heart failure is, what B-type natriuretic peptides are, how we formed our advice and the evidence we considered. It also explains what the advice means for people who have undergone, or may have to undergo, a B-type natriuretic peptide test.

The full evidence is discussed in detail in our report called *Health Technology Assessment 6: The use of B-type natriuretic peptides in the investigation of patients with suspected heart failure*. Copies of the report are available from NHS QIS and on its website, [www.nhshealthquality.org](http://www.nhshealthquality.org)

The words in **bold** are explained in the Glossary at the end of this document.



## What is heart failure?

The term 'heart failure' does not mean that the heart has stopped working, but that its ability to pump blood is weaker than normal.

In people who have heart failure, the heart cannot pump enough blood to meet the body's needs.

Heart failure can be caused by a number of conditions including a narrowing of the blood vessels to the heart (called coronary heart disease), high blood pressure (called hypertension) and damaged heart valves.

Typical symptoms of heart failure include difficulty in breathing (when at rest or during activity), dizziness, tiredness and swelling of the ankles.

Heart failure is often difficult to diagnose. Many people in the very early stages of heart failure do not have symptoms. Other people display the typical symptoms of heart failure, but further tests often show that these are being caused by another condition, such as problems with the lungs or a breathing disorder. Studies have shown that only about half of people diagnosed with heart failure by their general practitioner (GP) have the condition confirmed by further tests.

Heart failure is a potentially life-threatening condition, but it can be treated effectively if it is diagnosed early enough.

## What are B-type natriuretic peptides?

B-type natriuretic tests are simple blood tests that can help establish if someone has heart failure. B-type natriuretic peptides are proteins that are produced inside the heart and released into the blood.

There are two forms of B-type natriuretic peptides, called BNP and NT-pro-BNP. These are the same protein, but at different stages of development. Our advice relates to tests using both forms.

Normally, only low levels of B-type natriuretic peptide are found in the blood. As we get older, the amount of 'normal' B-type natriuretic peptides we produce naturally increases. This means that the 'normal' levels of B-type natriuretic peptide for an older person will be higher than the 'normal' levels for a younger person.

However, in people whose heart muscles have become particularly stretched and whose heart is not pumping as strongly as it should, there will be higher levels of B-type natriuretic peptide in the blood than would normally be expected.

A high level of B-type natriuretic peptides in the blood may indicate that the patient has heart failure and is at risk of further damage. However, a B-type natriuretic peptide test alone cannot confirm if someone has heart failure. This can only be confirmed by a test (called an **echocardiogram**) which is usually undertaken in a hospital.

A low level of B-type natriuretic peptides in the blood means that the patient is very unlikely to have heart failure and their symptoms are being caused by another condition.

The level of B-type natriuretic peptides in the blood can be measured with a simple blood test.



## Diagnosis of heart failure in Scotland

Every year in Scotland 30,000 people with heart failure make about 63,000 visits to their GPs and over 12,000 patients will be admitted to hospital with the condition.

Most people with suspected heart failure will initially be seen by their GP or by a doctor in a hospital.

A GP will ask the patient about their medical history, check for any signs and symptoms, and carry out a series of tests. This may include a test called an **electrocardiogram** (ECG), which provides information about the electrical activity of the heart.

A GP will use all of this information to decide if the patient potentially has heart failure. If so, the patient will be referred to a heart specialist who can confirm the diagnosis with an echocardiogram.

However, because not all GPs use ECGs or feel confident in interpreting the results from them, some are unsure about which patients should be referred to a specialist. As a result, many patients are unnecessarily referred to specialists when they do not have heart failure at all.

It may take several weeks for a patient to see a specialist. During this period, the patient's diagnosis remains unclear, but the GP may start to treat them with drugs for heart failure. If, however, the patient turns out not to have heart failure then such drugs are unnecessary and potentially harmful, and the true underlying condition remains untreated.

In a hospital, patients arriving with signs and symptoms of heart failure will be seen by a doctor who will carry out similar tests to those used by a GP, and possibly take a chest X-ray as well. However, even after these tests, there may still be uncertainty as to what exactly is causing a patient's symptoms.

While an echocardiogram will confirm if the patient has heart failure, there may be delays in getting the patient to an echocardiogram machine and, consequently, they may have to stay in hospital longer.

Although B-type natriuretic peptide testing on its own cannot be used to diagnose heart failure, it can rule out heart failure as a possible condition. Yet, B-type natriuretic peptide testing is currently not one of the tests routinely provided in Scotland for patients with suspected heart failure.

If B-type natriuretic peptide testing were more widely used, it would allow more doctors to rule out heart failure at an earlier stage. This would enable doctors to focus on other possible causes of the patient's condition, and identify the appropriate treatment sooner. It would also avoid further, unnecessary treatment for some patients.

Currently, there are only two Health Boards in Scotland that use B-type natriuretic peptide tests for patients with suspected heart failure.



## What we have recommended

We have advised that B-type natriuretic peptide tests should be more widely used in testing people for heart failure.

We have advised that:

- GPs who do not use, or are not confident in making an accurate diagnosis from an ECG in their own practice, should use B-type natriuretic peptide tests, along with information from other tests, to decide which patients should be referred to a specialist for further examination.
- B-type natriuretic peptide tests should be used in hospitals, along with information from other tests, when there is no timely access to an echocardiogram and it is not certain what is causing the patient's condition.
- B-type natriuretic peptide tests must not replace an echocardiogram in *diagnosing* heart failure.

## How we formed our advice

We used an internationally recognised process called **Health Technology Assessment** to form our advice. The assessment took account of the social, ethical, medical and economic implications of using B-type natriuretic peptide testing.

It brought together:

scientific evidence (eg journal articles)

+

expertise of healthcare professionals

+

needs and preferences of people with heart failure while considering the way NHSScotland is organised and how patients are currently managed.

We spoke to doctors, **cardiologists**, **biochemists**, nurses and patients to consider all the evidence. The evidence was recorded in a consultation report that we published. Comments received during consultation were published on the web and taken account of in our scientific document, the Health Technology Assessment report.



## Evidence used

We use the word 'evidence' to include information collected from a variety of sources, and we use different types of evidence to answer different types of questions. For example:

- Clinical effectiveness

Is B-type natriuretic peptide testing effective and accurate? When should it be used, and on which patients?

Evidence came from healthcare professionals, journal articles, studies and manufacturers of testing equipment.

- Costs and benefits

What is the cost of B-type natriuretic peptide testing? What costs can be saved by having GPs test patients for B-type natriuretic peptides rather than referring them on to a specialist unnecessarily?

Evidence came from healthcare professionals, studies we made about costs and savings, information about **clinical effectiveness** and journal articles.

- Organisational issues

Where is B-type natriuretic peptide testing currently provided in Scotland? Where B-type natriuretic testing is available, are the results obtained from a laboratory or point-of-care service (where the test is conducted on the ward and results are available within 30 minutes)?

Evidence came from healthcare professionals, surveys we conducted, studies, guidelines and manufacturers of testing equipment.

- Patient issues

What are the main concerns of patients with suspected heart failure?

What problems do they encounter when they are being tested for heart failure?

Evidence came from healthcare professionals, patient groups who were consulted by the National Institute for Clinical Excellence for their guideline on chronic heart failure, published in July 2003, and the patient website, [www.dipex.org](http://www.dipex.org)



## Sources of support and information

If you, or someone you care for, has heart failure then you can discuss our advice with your doctor, nurse or another healthcare professional.

Further information about heart failure is available from the British Heart Foundation ([www.bhf.org.uk](http://www.bhf.org.uk)), tel. 0131 555 5891, and Chest, Heart and Stroke Scotland ([www.chss.org.uk](http://www.chss.org.uk)), tel. 0131 225 6963.

The NHS QIS scientific report, *Health Technology Assessment 6: The use of B-type natriuretic peptides in the investigation of patients with suspected heart failure*, is available from NHS QIS or its website, [www.nhshealthquality.org](http://www.nhshealthquality.org)

## Glossary

<b>Biochemist</b>	A person who specialises in biochemical reactions and their measurements in human cells, tissues and organisms.
<b>Cardiologist</b>	A doctor who specialises in heart disease.
<b>Clinical effectiveness</b>	The evaluation of benefit against risk in a standard setting using outcomes of importance to the patient.
<b>Echocardiogram</b>	A test that uses sound waves to show an image of the heart and its internal structures.
<b>Electrocardiogram</b>	A recording of the electrical activity of the heart using leads placed on the chest.
<b>Health technology</b>	An intervention used to promote health; prevent, diagnose or treat disease; or provide rehabilitation or long-term care. This includes medicines, devices, clinical procedures and healthcare settings.
<b>NHSScotland</b>	The National Health Service in Scotland.



## **NHS Quality Improvement Scotland (NHS QIS)**

Our role is to improve the quality of healthcare in Scotland. We provide clear, authoritative advice on effective clinical practice, set national standards and monitor and publish reports on performance. We also advise on health interventions that are value for money, commission clinical guidelines and support the implementation of clinical governance. To advise on value for money, we must balance how well a treatment works with how much it costs.

### **Feedback**

Understanding our advice aims to explain the work of NHS QIS in a way that everyone can understand. We would warmly welcome feedback on this booklet. For example, have we clearly explained our advice on the use of B-type natriuretic peptides in the investigation of patients with suspected heart failure, and do you have any questions about our advice that were not answered here. Please give feedback to Rob MacPhail, Communications Officer, NHS Quality Improvement Scotland, Delta House, 50 West Nile Street, Glasgow G1 2NP, tel. 0141 225 6992, email: [rob.macphail@nhshealthquality.org](mailto:rob.macphail@nhshealthquality.org)

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