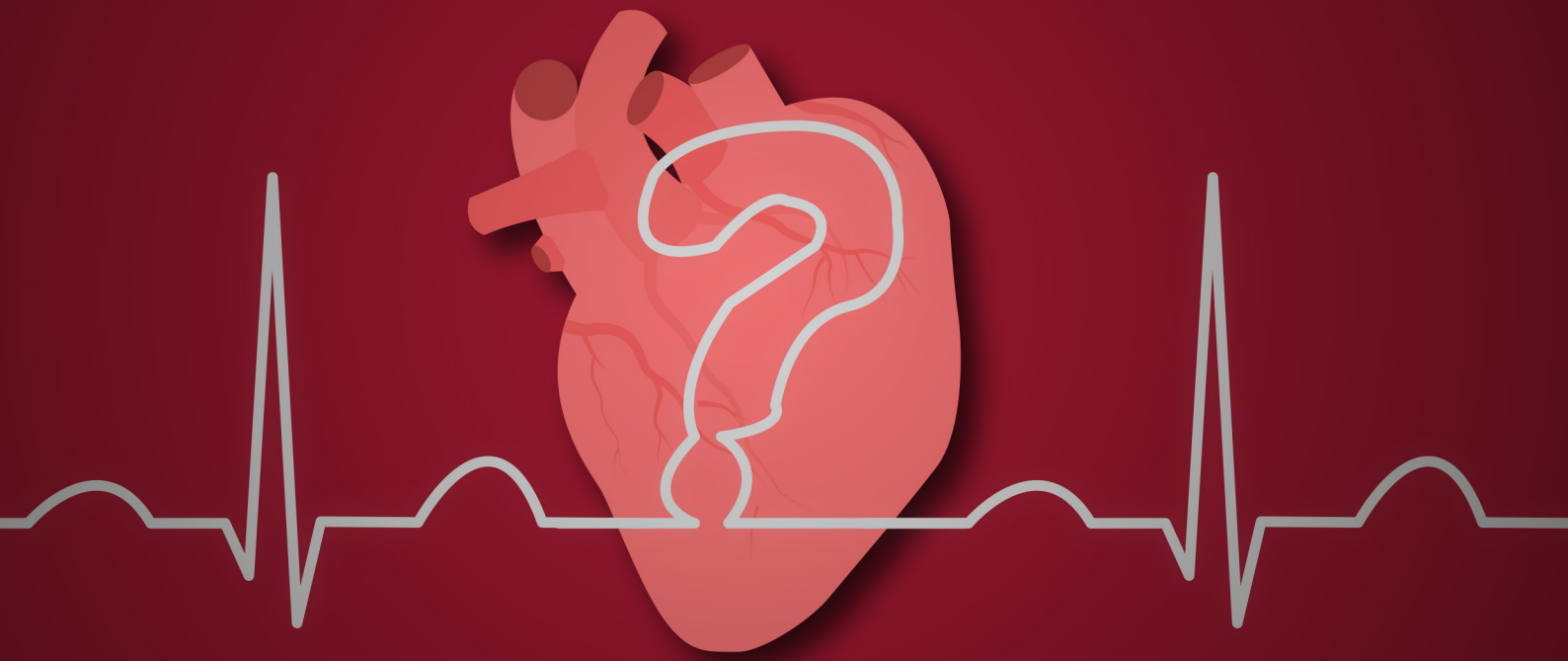
Monitoring Chronic Heart Failure: What does the evidence say?



At a glance

This brief summarises the evidence and implications for Chronic Heart Failure (CHF) monitoring from multiple studies at the University of Oxford, carried out under an NIHR Programme Grant.

This work points to three main implications:

1

Natriuretic Peptide (NP) is a useful diagnostic test; however, its use for monitoring CHF is not currently justified.

2

Use of point of care (POC) diagnostics for CHF in primary care is feasible, and patients welcome such monitoring.

3

To date the cost-effectiveness of monitoring of CHF in primary care is unclear, and is, regardless, perceived poorly by healthcare professionals in this setting.

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Background

Heart failure is a debilitating, long-term condition affecting almost 1 million people in the UK.

Their treatment and management can consume a large proportion of NHS and social care resources – thought to be around 2% of the total NHS budget.

Major medical studies have shown that a substance found in the blood, called 'natriuretic peptide' (NP), which is released from heart muscle during stress, raises in people as heart failure worsens, or reduces as their condition improves.

Monitoring of CHF has been suggested as important for guiding treatment.

However, unlike chronic kidney disease where laboratory testing of blood and urine is commonplace, biomarkers for CHF, such as NP, are rarely tested for on a regular basis.

Natriuretic peptide: A biomarker of CHF

There are multiple forms of Natriuretic Peptide (NP) and different methods of measuring it.

The two most common and relevant to CHF are B-type Natriuretic Peptide (BNP) and its biological precursor 'NT-proBNP'.

However, the use of either BNP or NT-proBNP as a diagnostic is considered comparable and there is no meaningful difference between them.

For the purposes of clarity in this brief 'NP' is used throughout for either form.

Methods

We examined a wide range of factors related to CHF, including reviewing current practice, the existing evidence for the use of NP as a guide for treatment or monitoring in primary or secondary care, and carried out feasibility studies for the use of NP testing in primary care (at point of care).

This included:

1. Database analysis, such as the Clinical Practice Research Datalink (CPRD)
2. Systematic reviews and meta-analyses (the scientific gold-standard for evidence)
3. Primary clinical research, such as feasibility studies
4. Qualitative interviews and focus groups with patients and healthcare practitioners

Summary of main findings

1. Treatment guided by NP could improve all-cause mortality in CHF patients by 13%. The effect on heart failure admissions specifically was a relative reduction of 20%. However, there is a degree of uncertainty in this effect (or these effects) due to the reliability of studies (mostly concerns about their size and robustness). [1,2]
2. Remote monitoring of patients with CHF, such as home telemonitoring or telephone support, showed reductions in all-cause mortality and admissions to hospital for heart failure, over conventional care (primary care monitoring). [3]
3. Point of care testing for NP in walk in clinics, such as GP surgeries, compared to other methods such as echocardiogram, showed that NP testing was variable in its ability to exclude CHF in patients. [4]
4. Predefined treatment protocols, the location of heart failure clinics, stringent NP targets, and incorporating a relative NP target were potential key components to reducing HF hospitalisations using NP- guided therapy. [5]

Summary of main findings cont.

5. Measurements of NP were very variable over a 3-month period in patients with 'stable' heart failure.[6]
6. A project with 27 adults showed that point of care testing for NP could be carried out in primary care, but that test results again showed high variability. [3]
7. Patient interviews indicated that blood tests for NP monitoring were not only acceptable but also reassuring, whether in primary or secondary care. Point of care testing in a primary care setting was preferred. [3]
8. Focus groups with healthcare professionals, drawn from practices in Oxfordshire and the Thames Valley area, showed that they acknowledged NP as a useful diagnostic test for CHF, but saw little benefit in regularly monitoring it, believing that costs would outweigh benefits. [3]
9. An analysis and review of existing health economic assessments of monitoring in CHF highlighted three areas for improvement of such analyses[3]:
    - Models used were not sensitive enough to allow assessment of more subtle improvements in CHF.
    - Few models accounted for individual patient characteristics and risk factors, though more modern analyses were better.
    - Data used came almost exclusively from historical clinical trials which recruited patients from hospitals, rather than in primary care populations.

What changes or actions do the findings point to?

1) NP is a useful diagnostic test; however, it's use for monitoring CHF is not currently justified.

There was an abundance of evidence that showed considerable variation (arising from assay and natural within person variability) in measurements of NP, even in patients with stable disease. As such, it is difficult at present to justify it's use for monitoring disease progression. A view also adopted by most clinicians interviewed.

While some studies did show that NP guided treatment might be beneficial, there is still a question mark over how reliable and how large this effect is.

2) Use of point of care diagnostics for CHF in primary care is feasible, and patients welcome such monitoring.

Despite the uncertainty in clinical usefulness of NP monitoring, focus groups and interviews did suggest that there is value to patients in regular monitoring of CHF. Patients also indicated that POC testing is favourable, as this can improve wellbeing by reducing the anxiety of waiting for test results.

3) To date the cost-effectiveness of monitoring of CHF in primary care is unclear, and is, regardless, perceived poorly by healthcare professionals in this setting.

We identified several gaps in the cost-effectiveness evidence for monitoring CHF that makes it difficult to determine one way or the other if it is worthwhile. This is especially true for primary care settings as most studies used data from secondary care.

Further information and references

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