

# Lessons learnt from HF coding in primary care. What might best practice look like?

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**H**ear failure (HF) is a prevalent and complex condition that demands precise and efficient management. This paper delves into a critical, yet often under-recognised, challenge in HF care – the accurate coding of patients on HF registers. We explore how discrepancies in coding, including missing patients and incorrect HF type classifications, can significantly impact patient management. The experiences of our healthcare system's staff are examined to shed light on the real-world implications of these issues.

Clinicians and administrative staff in primary care can play a pivotal role in identifying, monitoring, and ensuring the accuracy of patient coding. By sharing their insights, we uncover the intricacies of addressing coding discrepancies and strategies suggested to optimise patient management. Furthermore, we investigate the technology and systems in place to aid staff in this endeavour.

This paper aims to contribute to the broader healthcare community's understanding of the challenges related to coding accuracy in HF registers and to offer insights into potential solutions. By rectifying these coding discrepancies, we can enhance patient care, minimise potential oversights, and ultimately improve outcomes for individuals living with HF. Our findings underscore the significance of ensuring that no HF patient is missed or misclassified, emphasising the need for continued improvement in this vital aspect of HF care.

## Introduction

Heart failure with reduced ejection fraction (HFrEF) affects 3.5–7.0% of patients aged 65–75 years, and up to 11% of those >80 years. Heart failure with preserved ejection fraction (HFpEF) accounts for at least half of heart failure diagnoses. The current overall prevalence of HFpEF (also known as HF with normal ejection fraction – HFnEF) and HFrEF is estimated to be 4.9% and 3.3%, respectively. Prevalence is expected to rise with an ageing population. There are multiple interventions proven to prolong life in patients with HFrEF.<sup>1</sup>

General practitioners (GPs) in the UK are financially incentivised by the Quality Outcomes Framework (QOF) to maintain a register of patients with heart failure and to manage them appropriately (table 1).<sup>2</sup> Within this registry, GPs can document who has left ventricular systolic and diastolic dysfunction (LVSD-HFrEF; LVDD-HFpEF), who has had an echocardiogram and how many patients are receiving first-line treatments for HFrEF, i.e. angiotensin-converting enzyme inhibitors (ACEi), angiotensin-receptor/neprilysin inhibitors (ARNi), angiotensin-receptor blockers (ARBs) and licensed beta blockers (BB).

The project went beyond QOF to implement more recent evidence for use of mineralocorticoid-receptor antagonist (MRA) and sodium-glucose cotransporter type 2 inhibitor (SGLT2i).

However, there are likely to be errors in, and omissions from, these registers. Some patients may be included before tests that provide an objective diagnosis are completed; other entries may contain incomplete information and many patients will remain unrecorded or undetected,<sup>3</sup> and some will have incorrect categorisation of type of HF.

Unsurprisingly, the prevalence of HF, measured by the proportion of patients within a practice population on a heart failure register, is much lower than expected from epidemiological reports; approximately 0.7–1.0%. The exact reasons for this

Table 1. Quality and Outcomes Framework for England 2023–2024<sup>2</sup>

Indicator	Points	Thresholds
<b>HF001</b> Establish and maintain register of patients with Heart Failure	4	Protected income
<b>HF008:</b> The percentage of patients with a diagnosis of heart failure on or after 1 April 2023 which: 1. Has been confirmed by an echocardiogram or by specialist assessment in the 6 months before entering on to the register; or 2. If registered at the practice after diagnosis, with no record of the diagnosis originally being confirmed either by echocardiogram or by specialist assessment, a record of an echocardiogram or a specialist assessment within 6 months of the date of registration	6	50–90%
<b>HF003:</b> In those patients with a diagnosis of heart failure due to left ventricular systolic dysfunction or whose heart failure is due to reduced ejection fraction, the percentage of patients who are currently treated with an angiotensin-converting enzyme inhibitor (ACE-I) or Angiotensin II receptor blocker (ARB)	6	60–92%
<b>HF006:</b> The percentage of patients with a current diagnosis of heart failure due to left ventricular systolic dysfunction or whose heart failure is due to reduced ejection fraction, who are currently treated with a beta blocker licensed for heart failure	6	60–92%
<b>HF007:</b> The percentage of patients with a diagnosis of heart failure on the register, who have had a review in the preceding 12 months, including an assessment of functional capacity and a review of medication to ensure medicines optimisation at maximal tolerated doses	7	50–90%

heart failure (umbrella diagnosis) and an accurate subcategory, type of heart failure (spoke diagnosis). Those that did not have objective evidence or were coded in error were removed, and missing diagnostic codes were added where objective evidence was found within clinical correspondence. In essence, those patients' notes which had a HF diagnostic code with no subcategory code were reviewed and relevant echocardiogram codes added with HF. Conversely, those that had a subcategory code (for example HFrEF/LVSD) who were not coded as HF; therefore, not on the HF register were looked at next. Those that should be on the HF register were coded as such. The second step of initial data validation looked at the codes relating to HF used; this can identify patients missing a diagnosis of HF (table 2).

The clinical searches were re-run to create a report for the practice team to view the overall impact prevalence results and those patients with HFrEF.

The report also illustrates those with HFrEF who are taking *no* therapies, in addition to those taking *one or more* of the four pillars of HFrEF treatment.<sup>7</sup> The report can facilitate workstreams for primary care and allow prioritisation of those patients at higher risk of deterioration. The reporting data are available to the practice through an online dynamic reporting dashboard, which can be benchmarked against practices within their Primary Care Networks (PCN) and Integrated Care Boards (ICBs). ICBs/PCNs can select the OHFNS therapeutic review service, which includes clinical notes review, recommendations being discussed with the primary care lead healthcare professional.

### How are patients coded in primary care?

At this point it is useful to consider how patients are coded in primary care. Clinicians use diagnostic coding during consultation, but a great deal of coding for HF patients is generated by non-clinical practice staff who scan incoming clinical letters and reports from secondary care, emergency department, community-based HF services and open-access echocardiography services. These take the form of echo reports, one-stop diagnostic HF clinic letters, hospital-discharge summaries and secondary-care

are unknown; one possible explanation for the discrepancy is that the clinical features of HF are non-specific and common, which may lead to underdiagnosis or misdiagnosis. Incomplete or incorrect electronic coding may also play a role.<sup>1,4</sup> The change in definition by the National Institute for Health and Care Excellence (NICE) to replace HF due to LVSD and HF with normal ejection fraction (HF<sub>n</sub>EF) (often due to LVDD), with HF<sub>r</sub>EF, HF<sub>mr</sub>EF (heart failure with mid-range ejection fraction) and HF<sub>pf</sub>EF may have further confused primary-care physicians, as well as secondary-care clinicians.

However, QOF data 2021/2022<sup>5</sup> has shown a wide range of individual practice prevalence across England (0–14%), which may reflect unwarranted variation. An example includes a practice in the northwest region of England that has an 8% practice prevalence for HF, while a nursing home practice reports 14%.

### Rationale

Clinical audit streams have found common coding errors, inaccuracies and omissions in primary care.<sup>1</sup> Cuthbert *et al.*'s audit<sup>1</sup> found that incorrect electronic coding is the main reason why patients may be missing from primary care heart failure registers,

and surmised that this was possibly a consequence of the ever-changing ways in which patients can be coded for various symptoms or conditions on electronic records. The authors have found this also to be the case. Absent or incomplete coding may mean that some patients with HF are missed, and their care may suffer as a result.<sup>3</sup> Improved coding and accuracy of HF registers would also lead to improved income generation for GP practices through QOF.

This article aims to highlight these common errors, discuss what best practice around heart failure coding might look like and provide coding guidance.

### Clinical audit process

Oberoi Disease Management Heart failure (ODM-HF)<sup>6</sup> digital audit platform was used to identify patients who may have HF through hierarchical searches of patients' primary care records in 23 GP practices across East Riding of Yorkshire, Darlington and Tees Valley clinical commissioning group.

The Oberoi heart failure nurse specialist team (OHFNST – AC, MCR) completed a two-stage data validation process. The first step was to validate the existing HF register – ensuring patients on the register have an overarching

Table 2. Search queries

Obero Disease Management – Heart Failure (ODM-HF) – search queries
Search 1: Patients on HF register with no HFpEF, HFmrEF or HFrEF coding
Search 2: Patients with HF 'subcategory' code and no HF code
Search 3: Patients not on HF register with codes related to HF (admin/referral codes)
Search 4: Patients not on HF register with codes related to left ventricular failure
Search 5: Patients not on HF register prescribed loop diuretic in last 4 months with elevated NT-proBNP blood results
Search 6: Patients not on HF register prescribed loop diuretic in last 4 months with impaired LV code
Search 7: Patients not on HF register prescribed MRA or ivabradine in last 4 months
Search 8: Patients not on HF register prescribed digoxin and ACE/ARNI/ARB in last 4 months
Search 9: Patients not on HF register prescribed ACE/ARNI/ARB plus loop diuretic and licensed HF BB in last 4 months

**Key:** ACE = angiotensin-converting antagonist; ARB = angiotensin-receptor blocker; ARNI = angiotensin-receptor/neprilysin inhibitor; BB = beta blocker; HF = heart failure; HFmrEF = heart failure with mid-range ejection fraction; HFpEF = heart failure with preserved ejection fraction; HFrEF = heart failure with reduced ejection fraction; LV = left ventricular; MRA = mineralocorticoid-receptor antagonist; NT-proBNP = N-terminal pro-B-type natriuretic peptide

Through the validation work, we found that some clinical specialist teams were coding a normal echocardiogram result incorrectly, i.e. instead of using the code 'Echocardiogram shows normal left ventricular function', clinicians were using the code 'Left ventricular systolic dysfunction', and adding the free-text word 'normal'. Unfortunately, using the latter added multiple patients with a LVSD diagnostic code. To correct these cases, the incorrect code was 'marked in error' and replaced with the desired code. These findings were communicated to the clinical teams so further coding mistakes could be avoided. There were few patients sub-coded as HFpEF/HFnEF reflecting a lack of understanding of the diagnostic criteria required for an accurate diagnosis.

### Theme 2: discharge summaries, clinic letters and reports received in primary care

Similar misdiagnosis errors can occur when clinical correspondence arrives at the practice. Those patients who have had an admission for left ventricular failure (LVF) will be coded as LVF. The diagnostic code LVF will automatically place the patient on the HF register. There are a few points to consider here, some patients present with acute fluid overload and are discharged home without an inpatient echo; often awaiting an outpatient echocardiogram appointment. Some patients, for a number of reasons, may not attend for the scan and remain on the register without a definite diagnosis, type of HF and associated aetiology being determined. Primary care may not have the diagnostic information to progress with coding or what to consider at the primary care HF annual review. The second consideration is that those patients that have their scan can have normal left ventricular function, with no other concerning findings. In our experience, these admissions are often linked to severe hypertensive crisis and/or atrial fibrillation with a fast ventricular response. What do clinicians do with these patients? The patient with a normal echocardiogram and no further episode of clinical HF, who requires no further input, no symptoms of HF, no need for diuretics and has other comorbidities well managed; may not be best placed on the HF register. However, each case should be reviewed individually and discussed with a lead clinician, as many cases

consultant outpatient clinic letters. Clinical staff read letters and highlight content that needs coding. A member of admin staff will then attempt to allocate suitable diagnostic codes, some practices have guidelines/agreements as to how particular conditions are coded. Some diagnostic codes will also be included in a patient's main problem or summary section of their primary care record.

### What could possibly go wrong!

Within the clinical practice systems there are multiple codes available for primary-care clinicians and non-clinical staff to choose from (appendix 1, available on request). Too much choice causes confusion, and coding can be fraught with difficulty. From our experience we aim to highlight several coding errors that are worthy of sharing with other clinicians.

## Common errors in HF coding – what did we find?

Our work reflected previous published findings of high levels of misdiagnosis and missed diagnoses.<sup>1,8</sup> Absent or incomplete coding meant that some patients with HF were missed.

### Theme 1: misdiagnosis from coding errors

These errors were detected from actual in-house practice consultations and chronic

disease reviews. We found that patients are inadvertently coded in the clinical consultation notes as 'Heart Failure' before objective evidence is obtained, i.e. from echocardiogram results. A clinician may not notice the auto code is selected in the record or the clinician is under the impression clinical coding for query diagnoses are coded in this manner. Using a '?' before the HF or LVF code is commonly found, clinicians do not always realise this action will place the patient on the practice HF register.

Using New York Heart Association (NYHA) classification codes to document breathlessness during a consultation will add the patient to the HF register, regardless of a diagnosis being confirmed. This can also occur in routine annual reviews, such as coronary heart disease, where NYHA status has been included in the disease template for all heart patients, regardless of presence of HF. The authors are aware that some cardiology services routinely assess and document NYHA status in those with arrhythmias and chest pain without clinical signs or diagnosed HF. In such cases, there will be a number of patients on the practice HF register who do not have HF; such patients should be removed from the register and the NYHA code removed.

**Table 3. Further findings from our experience**

Common errors and omissions found during data validation
Patients who are on the HF register do not always have a subcategory code, i.e. echo shows left ventricular systolic dysfunction
Patients who are found to have a subcategory coded in their record are not always found on the HF register
Clinic letters that don't include a clear diagnosis or document LV function and ejection fraction, but fail to list heart failure as a diagnosis
Coding that the patient has had an echo but not coding what the findings were
NYHA classification codes used for patients without diagnosed heart failure, for example using NYHA code to categorise breathlessness in an outpatient clinic/cardiology letters/primary care chronic disease clinic
Coding LVF without further investigation
Ambiguity in coding, e.g. LVSD (normal) used
Incorrect coding that suggests to other practitioners the patient has HF, e.g. seen in HF clinic/HF team when it was cardiac rehabilitation or a rapid-access chest pain clinic
Not coding normal echo results – this rarely happens, and if done, is often difficult to locate in the notes
<b>Key:</b> HF = heart failure; LV = left ventricular; LVSD = left ventricular systolic dysfunction; LVF = left ventricular failure; NYHA = New York Heart Association

are historic, and can date back to an episode of LVF decades ago.

Finally, there are patients who have been seen by cardiac rehabilitation teams post-myocardial infarction with what is most probably transient LVSD relating to myocardial stunning. Caution should be applied when assessing whether these patients should be added to the HF register; signs, symptoms and ongoing cardiological evidence should be reviewed when making decisions for coding going forward.

**Table 3** summarises further findings from our experience.

Miscoding heart failure can lead to a cascade of further coding that compounds the original error,<sup>3</sup> and this could lead to psychological distress and impact upon insurance premiums. An example would be where a patient is automatically selected for a HF annual review inappropriately. An assumed diagnosis of HFrEF can lead to medications being initiated when not indicated. The continued use of HF review codes in such patients continues the false legacy the patient has a HF diagnosis. This confusion leads to clinicians assuming a patient has HF and a patient thinking they have HF when they do not.

In addition, in those with a HF diagnosis where there is no category code can lead to clinical

confusion on how the patient should be managed, i.e. HFrEF therapies used in a HFpEF case.

## What diagnostic codes should be used?

**Table 4** lists the codes that can be used to streamline the process of HF coding in primary care.<sup>11</sup> Communication between secondary care, community services and primary care is key so that all sectors use a consistent approach and are aware of the impact upon HF coding and management.

## What might help improve the situation?

There are a number of recommendations that can be made, including the development of a national document that guides both primary and secondary care in how to code HF for primary-care requirements.

Hospitals in the UK lead the data completion for the Heart Failure National Audit (HFNA),<sup>9</sup> an annual report that summarises the UK's national profile on HF admissions, mortality, access to echo, specialist teams and what medications patients are being prescribed during their admission. There is a need to collect data from primary care to create a

**Table 4. What codes to use<sup>11</sup>**

Step 1. Add the 'umbrella' diagnosis
Heart failure (disorder) <b>84114007</b>
AND
Step 2. Add the appropriate 'spoke' diagnosis
HFrEF
Echocardiogram shows left ventricular systolic dysfunction (finding) <b>407596008</b> . This is a commonly used code that can be used to subcategorise HFrEF patients
Heart failure with reduced ejection fraction (disorder) <b>703272007</b> . The advantage of using this code is that it simultaneously places the patient on the HF register
HFmEF
Heart failure with mid-range ejection fraction (disorder) <b>788950000</b>
HFpEF
Echocardiogram shows left ventricular diastolic dysfunction (finding) <b>407597004</b> . This is a commonly used code that can be used to subcategorise HFpEF patients
Heart failure with normal ejection fraction (disorder) <b>446221000</b> . The advantage of using this code is that it simultaneously places the patient on the HF register

joined-up system of audit for HF.<sup>10</sup> If services can work together to ensure primary care can achieve accurate diagnostic coding for this health cohort; the creation of a national primary-care audit will yield more accurate and meaningful data.

## Recommendations for secondary care and other professionals sending clinical correspondence to primary care

- When left ventricular (LV) function suggests HF, ensure the diagnosis heart failure is listed as a clinical problem in addition to the echo findings. If the echocardiogram result alone is added in primary-care systems, the practice may not code HF and the patient will not be added to the HF register. Practice prevalence will ultimately be affected, and patients will miss out on an annual HF review and appropriate management.
- Try to ensure secondary care, including emergency departments (ED), do not code HF prior to investigation that confirms diagnosis.

- Avoid the use of NYHA class to document breathlessness unless the patient has HF (remember even NYHA class I code will place a patient on the practice HF register).
- When reporting improved LV function on echocardiogram, if appropriate, include a note about the need to continue HF treatments.
- Work collaboratively with primary care to create locally agreed terms for HF and LV function (with LV ejection fraction). Where possible use those terms in correspondence.

### Recommendations for primary care

- Use agreed 'umbrella' code for recording a HF diagnosis.
- When coding patients, in addition to the existing 'umbrella' code of 'heart failure', where possible a subcategory or 'spoke' code should be added.
- Put a HF code and subcategory code in the main problems/summary sections of the patient's record on the primary-care system.
- Code normal echo findings following a diagnosis for HFrEF – include a note about continuing treatment – they have improved, most are not cured.
- Work collaboratively with secondary care to create locally agreed terms for HF, LV function (with LV ejection fraction) and standardised echocardiogram reporting for HF across ICBs.

## Conclusion

The need to expand the National Heart Failure Audit into primary care is recognised, but coding HF is not straightforward, and this is compounded by the plethora of HF codes available. The authors suggest that there is an opportunity, prior to the national HF audit expansion to create a national guideline on HF coding. Collaboration between secondary- and primary-care services involved in the care of patients with HF is paramount. From our experience, there is a clear need for educational training in the use of HF coding for primary care and secondary care to ensure all patients are clearly identified, diagnosed, managed and reviewed efficiently and effectively in primary care.

Inaccurate coding may have an impact on patient care including underuse or overuse of evidence-based therapies for HF with potential for patient harm. Further work is needed to study the impact of the Oberoi Disease Management (ODM-HF<sup>®</sup>) digital audit platform in HF band clinical reviews on medicines optimisation ●

### Conflicts of interest

AF has received honoraria from Novartis, Boehringer Ingelheim, Lilly, Roche diagnostics, Astra Zeneca, and is Medical Director for Oberoi Consulting. JA has received honoraria from Novartis, Boehringer Ingelheim, Lilly and Astra Zeneca. AC (Goode) has received honorarium in former roles from Novartis UK, AstraZeneca UK and Takeda UK and is an employee of Oberoi Consulting. KO is Managing Director of Oberoi Consulting. MCR, JC and SJ are all employees of Oberoi Consulting.

## Key messages

- Inaccurate coding can prevent effective medication optimisation for evidence-based care
- Primary care audits find missing patients with heart failure (HF). Every practice should audit their HF register, ideally more than once
- Clear, concise written communication between primary and secondary care is paramount for gold-standard care

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### Study approval

This work was classified as clinical audit as it did not involve anything being done to patients beyond their normal clinical management and therefore did not require formal ethical approval.

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### Editors' note

Appendix 1 is available from the authors on request.

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