National Cardiac
Audit Programme

NICOR

National Heart Failure Audit (NHFA)

Published 2023 Summary Report

(2021/22 data)

Updated October 2023

BRITISH SOCIETY FOR HEART FAILURE

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Report at a glance

Hospitalisation for heart failure 2021/22

Access to Cardiology wards and Specialist HF care is associated with better survival for and improved treatment at discharge for those with HFrEF.

Age and sex of heart failure patients

The average (mean) age of a heart failure patient was **77.7** years old in 2021/22. Men are typically younger than women when admitted to hospital with heart failure with an average age of **75.9** years compared to the female **80 years**.

63,644
Validated admissions

	All patients	Seen by a specialist	Admitted to a Cardiology Ward
Patients diagnosed with **echocardiography**	85%	89%	92%
Patients receiving **specialist care**	82%	100%	99%
Patients with HFrEF **discharged on all three disease-modifying drugs**	56%	59%	65%
Patients who received a **cardiology follow up**	32%	35%	44%
Patients who received a **Heart Failure nurse follow up**	58%	64%	69%
Patients referred to **cardiac rehabilitation**	10%	11%	15%
Mortality in Hospital	9%	8%	6%

Place of care is a key quality indicator for HF as care on a cardiology ward is associated with the best survival, both during admission and after discharge, better treatment for HFrEF and the best access to specialist care.

Executive Summary

This report summarises selected key findings from the National Heart Failure Audit (NHFA), part of the National Cardiac Audit Programme (NCAP). It deals with a specific and crucial phase in the disease trajectory of patients admitted to hospital with heart failure (HF) in England and Wales. There is a particular focus on a set of quality improvement (QI) metrics, based on standards and guidelines, which aim to drive up standards of care during an acute admission to achieve better patient outcomes.

The report is based on data from the financial year 2021/22. This period covers our emergence from the first year of the COVID-19 pandemic, which challenged the capacity of healthcare systems around the world. The effects are still being felt across the NHS including substantial disruptions to cardiovascular care. As a result, there continued to be a marked reduction in the number of validated HF admissions to the audit in the 2021/22 reporting cycle.

The audit data reported represents 78% of the admissions recorded in HES/PEDW and, as such, are an accurate representation of patients admitted to hospital with HF in England and Wales. Some of the reduction in submissions may result from implementation of a revised audit dataset aimed at improving data quality through the use of stricter filters.

Overall, many areas of care appear to have improved or remained stable despite the post-pandemic challenges. More worryingly, there is a large number of quality measures that appear markedly compromised and there is a considerable way to go before all hospitalised HF patients receive optimal care.

Where levels of care were maintained or remained broadly stable		
Similar proportions of patients were seen on a cardiology ward	→	47% of patients accessed a cardiology ward compared to 48% in 2020/21.
Similar proportions of patients accessed specialist care	→	Remains at 82%.
Inpatient mortality was unchanged	→	Remains at 9%.

Where things improved/practices changed	
30-day mortality improved	Increased to 16% during the 2020/21 audit cycle, but has now improved to 14%.
Prescribing of the three classes of drug for heart failure with reduced ejection fraction (HFrEF) improved	Increased from 54% in 2020/21 to 56% when analysed in the usual manner (excluding "unknown categories" from the analyses).

Where things worsened/causes for concern	
There was a reduction in referral for cardiology follow-up	32% of patients were referred for cardiology follow-up, down from 39% in 2020/21.
Referral rates to rehabilitation dropped further	Under 10% of patients were referred for cardiac rehabilitation, down 3% from 2020/21.
There was a fall in timely specialist follow-up	Specialist follow-up within 2 weeks of discharge fell to 40% from 43% in 2020/21.
Prescribing of drugs for HFrEF fell when exception reporting removed	Although there was a modest increase in aggregate prescribing this year when analysed as previously, the figure fell 10% to 46% when patients with "unknown categories" were included in the analysis using a new data quality tool.

Summary of recommendations

1. Hospitals not achieving the recommended standard in the use of inpatient echocardiography for patients with acute HF should urgently review their clinical pathways and ensure that echocardiography is performed, ideally within the first 48 hrs of admission.

2. High-risk cardiac patients, including those with heart failure, should have access to a cardiology ward.

3. Hospitals not achieving the standards for ensuring that a patient with acute HF is seen by a HF team should review their pathways of care and consider a quality improvement programme to improve their performance.

4. Hospitals that do not have a clinical lead for heart failure should appoint one (ideally a consultant cardiologist with sub-specialty training in HF). The lack of a named lead should feature on their risk register.

5. Hospitals that do not have access to specialist HF nurses within their hospital team or in the community should seek to appoint them urgently.

6. All patients with HFrEF should receive best-practice disease-modifying drugs unless there is a contra-indication.Treatment is improved by patients being managed on cardiology wards or being seen by a HF specialist team, early during an admission, and ensuring patients are not prematurely discharged from hospital. Those hospitals not meeting the expected standards should perform a clinical pathway review to investigate where improvements can be made. Hospitals should make every effort to record all medications at discharge and avoid entering 'unknowns' in their audit submissions.

7. Patients should be referred for Cardiology & Specialist HF Nurse follow-up, ideally leaving hospital with their first appointment. Hospitals should review their pathways for referral to cardiac rehabilitation to allow greater access and uptake for HF patients.

1 Introduction

This report summarises the key findings from the National Heart Failure Audit (NHFA), part of the National Cardiac Audit Programme (NCAP).

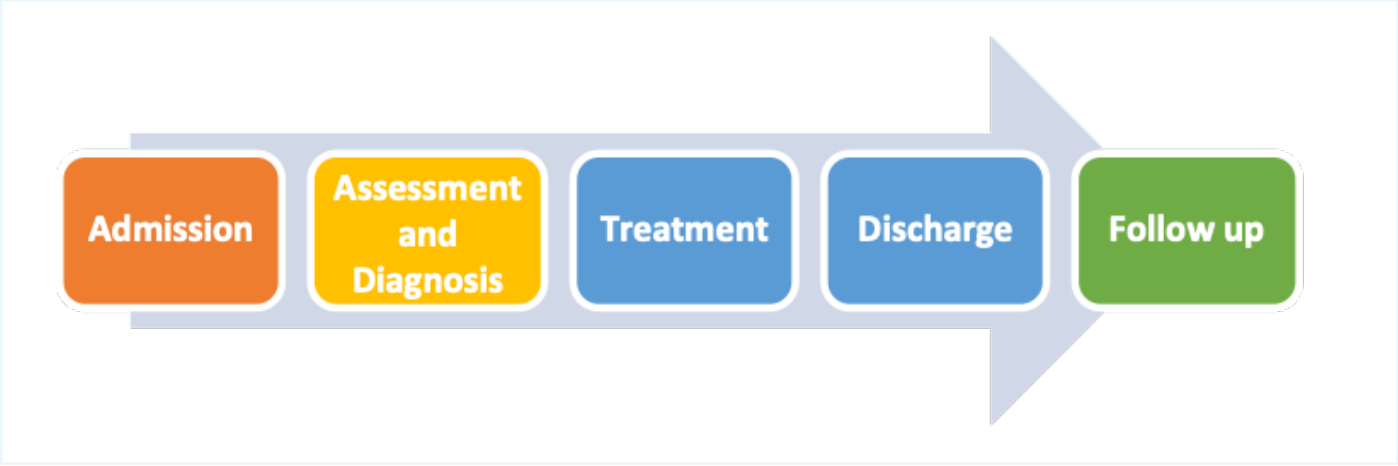
It focuses on several quality improvement (QI) metrics that aim to drive up standards of care and achieve better patient outcomes during an admission to hospital.

This is accomplished by:

- capturing data on clinical indicators that have a proven link to better outcomes in clinical trials
- encouraging the increased use of diagnostic tools and disease-modifying treatments recommended in national and international clinical practice guidelines and quality standards.[1 2 3]
- ensuring patients follow robust referral pathways.[4 5]

The report explores the characteristics of patients requiring acute admission to hospital with HF, describes their in-hospital investigation, treatment, access to specialist care, discharge planning and the offer of post-hospital follow-up. The results reflect the patient journey for people hospitalised because of HF [Figure 1.1] For a general introduction to HF and the audit methodology see Appendix 1 and Appendix 2.

Figure 1.1: The patient pathway for a typical HF patient in the NHFA audit



The rest of this report is structured as follows:

- **Section 2** highlights the principal findings as we emerge from the COVID-19 pandemic
- **Section 3** focuses on five of the QI metrics which should continue to be a priority, either for teams within hospitals or for those leading service commissioning and development at Integrated Care System (ICS) level
- **Section 4** provides some pointers towards the future direction of the audit.

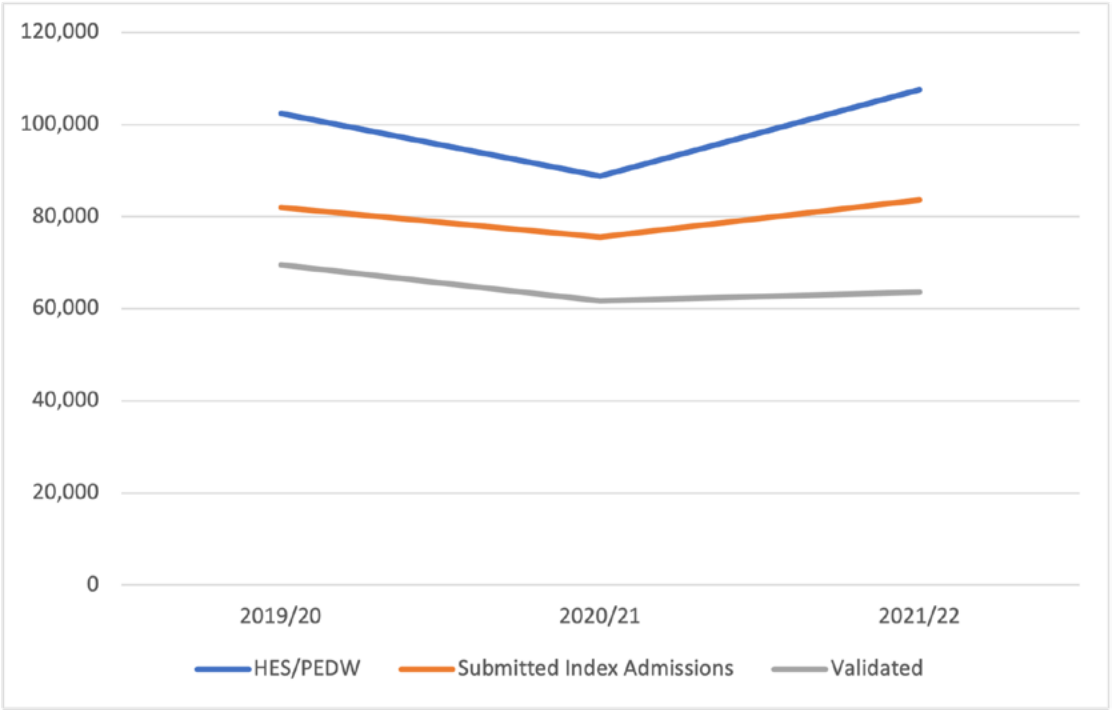
2 Principal findings as we emerge from the COVID-19 pandemic

2.1 HF admission rate still lower than before the pandemic

Data on 83,646 hospital admissions were submitted to the audit for 2021/22 and 63,644 were validated as patients with HF as their primary diagnosis [Figure 2.1]. This represents a 15% increase in submissions but only a 3% increase in the validated admissions compared to 2020/21. HES/PEDW coded HF admissions rose steeply in 2021/22 to 107,564 overtaking prepandemic levels. However, the audit data reported represents 78% of the admissions recorded in HES/PEDW and, as such, is an accurate representation of patients admitted to hospital with HF in England and Wales.

The total number of validated HF admissions remains slightly below the pre-pandemic figure of just over 69,500 in 2019/20. This could be because of a structural change within the audit itself. After implementation of a revised dataset, elective HF cases have been filtered out as part of ascertaining acute HF admissions.

Figure 2.1: Submitted and validated HF admissions, and HES/PEDW coded HF admissions in England and Wales, 2019/20 - 2021/22 [NHFA data]



2.2 Monthly admissions were not affected by the secondary pandemic waves

The impact of COVID-19 on HF admissions from February 2020 to March 2022 is shown in [Figure 2.2]. Admissions remained constant during the first peak of the Omicron wave in January 2022 and there was no dramatic dip as happened in the first year of the pandemic. There were no government COVID briefings advising patients to stay at home and patients requiring admission may have regained some confidence that being in hospital with acute HF was safer than being at home.

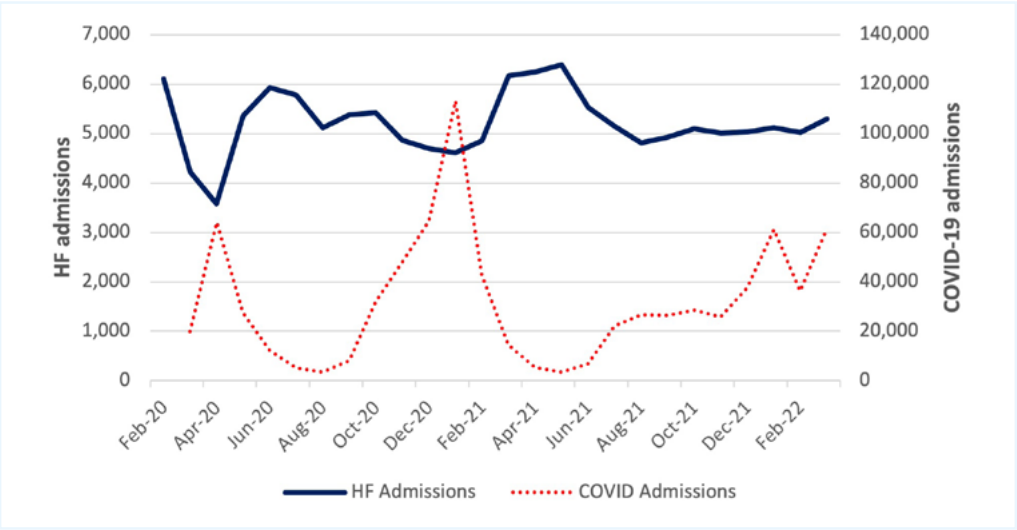


Figure 2.2: HF hospital admissions in England and Wales against COVID-19 hospitalisations, February 2020 - March 2022 [NHFA data]

2.3 There was no significant change in patient demographics

The average age of HF patients was very similar to the previous year at 77.7 years (75.9 for men and 80.0 for women). More males were in each age category other than for the 85 plus age group [Figure 2.3].

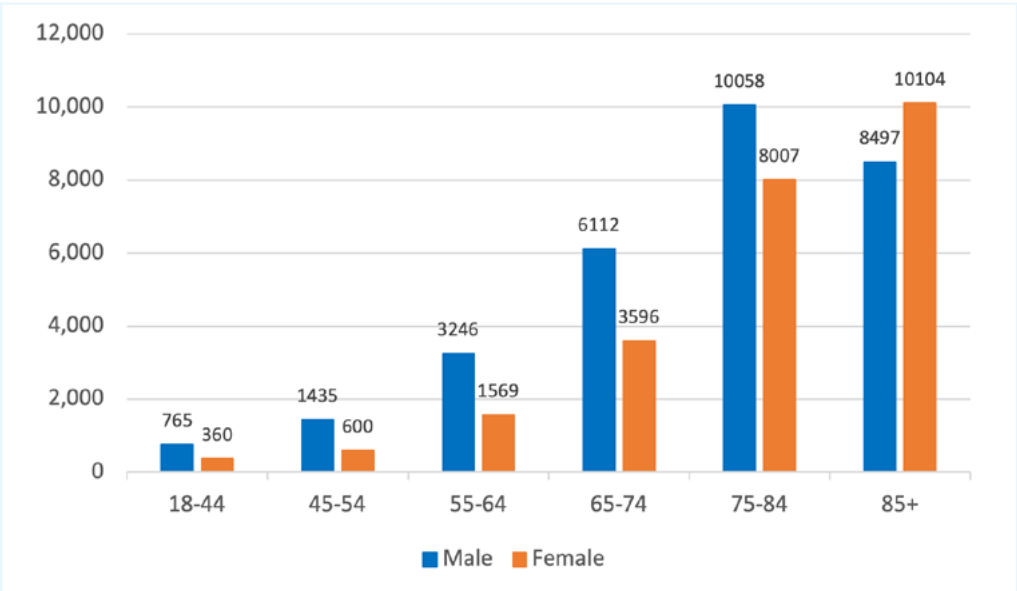


Figure 2.3: Age and sex of HF patients in England and Wales at first admission, 2021/22 [NHFA data]

2.4 A modest reduction in proportion of HFrEF cases was seen

Echocardiography is the main diagnostic imaging tool in determining the type of heart failure. It also provides some information on its underlying aetiology. As in previous years, very few patients (just over 1%) had a normal echo and, of those, only the cases with atrial fibrillation are included [Table 2.1].

Just under 56% of patients had heart failure with reduced ejection fraction (HFrEF), a lower proportion than the 58% reported in 2020/21 and 62% in 2019/20. Any decline in HFrEF is important as it is the phenotype of HF with the best evidence for disease-modifying therapies.

Table 2.1: Overall echo diagnosis breakdown of HF patients in England and Wales 2021/22 [NHFA data]

Assessment and diagnosis	%
Diastolic dysfunction	13
Left ventricular systolic dysfunction (LVSD)	55.8
Valve Disease	41.6
Hypertrophy	7.5
Normal Echo	1.2
Other	10.8

Ischaemic heart disease (IHD) continued to be more common in HFrEF cases, whereas hypertension and valve disease were more associated with HFpEF [Table 2.2]. Atrial fibrillation also occurs frequently, in 52% of patients with HFpEF and in 39% of those with HFrEF.

Of note is the consistently high co-morbidity burden. Over one third of patients had diabetes, and COPD and asthma were present in nearly 20% of HFpEF patients. Ten per cent of HF patients were recorded as having had a previous cerebrovascular accident (CVA).

Table 2.2: Causes and comorbidities in HF patients in England and Wales, 2021/22 [NHFA data]

Medical history	HFrEF (%)	HFpEF (%)
Hypertension	55.1	65.1
Atrial Fibrillation (AF)	39.2	52.3
Diabetes	34.2	36.4
Valve Disease	24.8	35.5
IHD	38.5	31.3
Previous COPD	15.5	19.7
Previous Asthma	10.3	11.2

2.5 Severity of symptoms and signs at admission

The profile of symptoms and signs reported this year is very similar to previous reports. Overall, 57% had either moderate or severe peripheral oedema and 80% were in NYHA Classes III or IV [Figure 2.4].

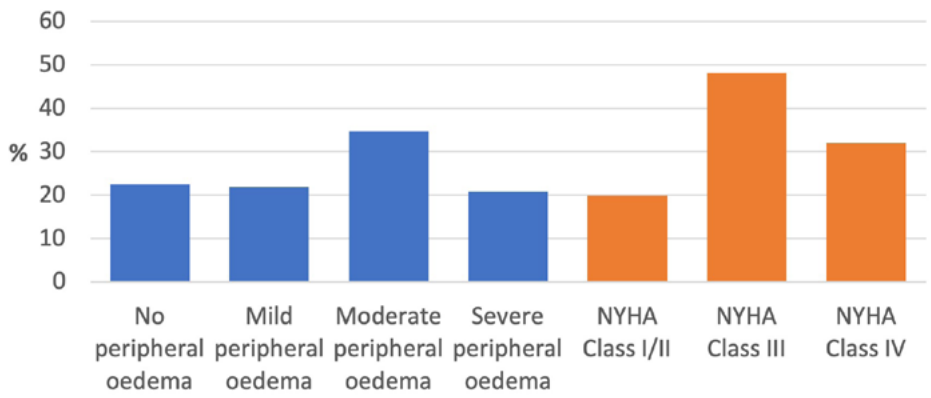


Figure 2.4: Severity of symptoms and signs of heart failure (%) in HF patients in England and Wales, 2021/22 [NHFA data]

2.6 Mortality

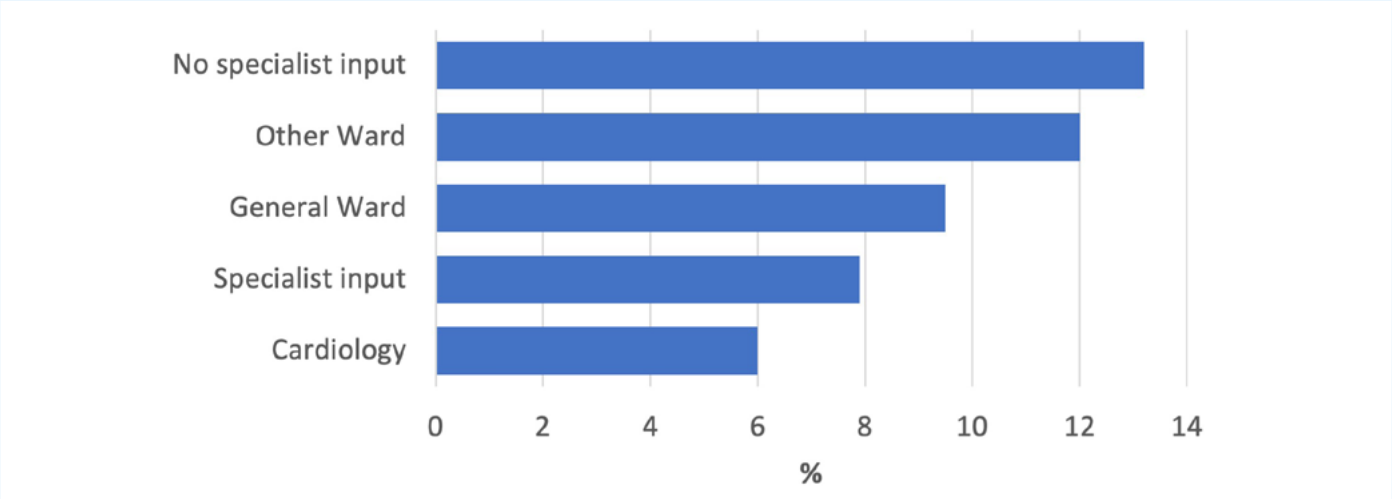
Good specialist care reduces the risk of death amongst HF patients, particularly those experiencing HFrEF. Mortality, both during admission and after discharge, reflects the quality of overall inpatient care during that admission. The benefits of such care for the patient, both in a reduced mortality risk and other measures, persist for years.

The NHF audit has repeatedly shown that in HFrEF a combination of three drug groups, namely beta-blockers (BBs), mineralocorticoid receptor antagonists (MRAs) and either angiotensin converting enzyme inhibitors (ACEIs), or angiotensin receptor blockers (ARBs) or ARNI (ARB with Neprilysin inhibitors), confer improved mortality and other benefits to a wider group than those usually seen in the clinical trials. Their use is strongly recommended.[6]

Overall in-hospital mortality for 2021/22 was 9%, similar to the previous year. Mortality varied with age, being 4.8% for those under 75 years and 10.4% for those aged 75 years or older.

The audit has consistently shown that mortality is lower for patients admitted to specialist cardiology wards (6.0% in 2021/22) compared to general medical wards (9.5%). It was also lower for those patients accessing specialist care (7.6%) compared to those who receive no specialist care (13.2%) [Figure 2.5].

Figure 2.5: In-hospital mortality of HF patients in England and Wales, 2021/22 [NHFA data]

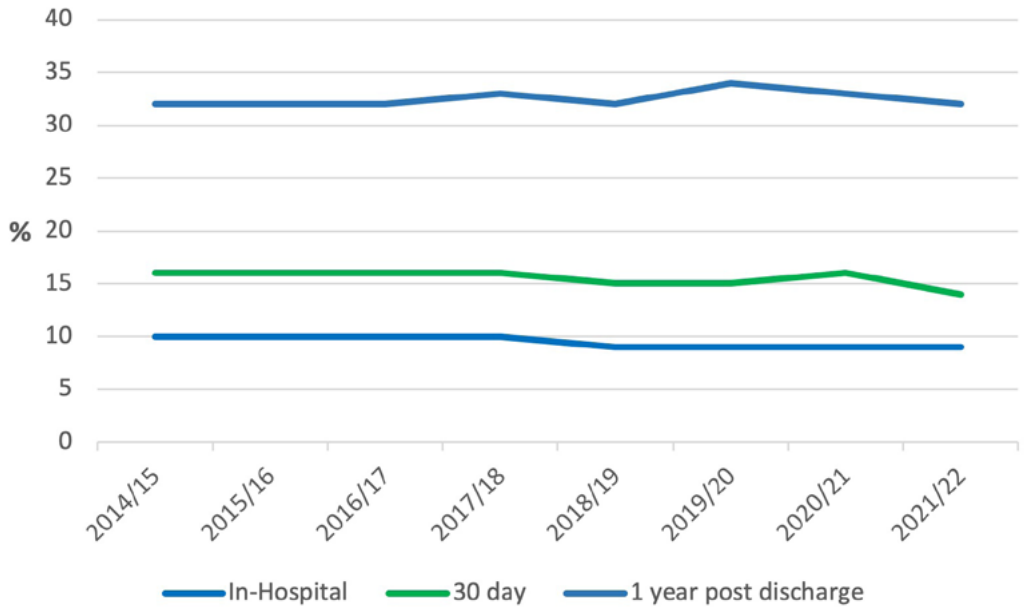


The findings are all important. Coming out of the COVID-19 pandemic, patients who are admitted to hospital and receive specialist care still have a markedly better outcome than those who do not. Specialist HF care despite the challenging post-pandemic phase remains vital for patients with HF. Hospitals therefore should review the adequacy of their current HF staffing levels accordingly, with careful review of their hospital data for the year 2021/2022, to ensure adequate HF specialist staffing provision.

30-day mortality reflects the quality of care during admission, as well as the discharge planning and transitional support offered. The 30-day mortality rate did drop this year to 14%, after having risen to 16% last year [Figure 2.6]. The transient increase in 2021/22 may reflect the shorter length of stay seen in the peak pandemic year, with more unstable patients being discharged earlier from hospital.

The 1-year mortality reflects the care during admission and the quality of longer-term follow-up. In 2021/22, 1-year mortality post discharge was 32%, slightly lower than the 33% reported last year. The change in 30-day mortality is likely to be robust as similar numbers of validated admissions were reported in 2020/21 and 2021/22 (61,784 and 63,644 respectively).

Figure 2.6: Inpatient, 30-day and 1-year post admission mortality (%) of HF patients in England and Wales, 2014/15 - 2021/22 [NHFA data]



There continues to be huge variation in mortality between hospitals, both in-hospital and, for those surviving to discharge, at 30 days and 1 year. We have developed a risk-adjustment model for the next reporting cycle (2022/23) to perform funnel plot analyses to detect outliers for mortality. The analysis will help us give more meaningful feedback to hospitals that have poorer outcomes.

Please see Appendices 3 and 4 for more detail on the Kaplan-Meier survival curves and multivariate analyses, respectively.

The findings reported in the Kaplan-Meier analyses are very similar to previous years. The mortality rate at one year was 32% among people discharged alive following admission. As in previous years, mortality at 1 year was lower for patients admitted to cardiology wards at 26%, lower for those having cardiology follow-up at 24% and lower for those seen by HF nurses at 29%. Cardiac rehabilitation was also associated with a better outcome at one year – 22% mortality compared to 33% for those not referred for rehabilitation. This may reflect a selection bias in favour of the small number offered rehabilitation.

Interestingly, while the disease-modifying drugs for HFrEF are associated with better outcomes, there is a paradoxical effect with loop diuretics. They appear protective for short term outcomes but are associated with a poorer outcome long term. It may be that better decongestion dominates in-hospital and 30-day mortality but in the longer term, diuretics are either harmful or associated with more severe disease. The phenomenon requires further analysis.

In multivariable analyses, adjusted for age, not being admitted to a cardiology ward, lack of disease-modifying therapy in HFrEF and no access to echocardiography are independent predictors of worse survival when other common markers of disease severity are included in the model (see Cox proportional hazards and the multivariable analysis in Appendix 4 for in-hospital mortality, 30-day and 1-year mortality).

2.7 Length of stay is longer under specialist care

Length of stay (LOS) reverted to match longer-term trends after falling sharply in 2020/21 [Figure 2.7]. For all admissions, the median LOS was 8 days compared to 7 days last year. It remains higher for those accessing specialist care (9 days) or those who are admitted to cardiology wards (9 days) compared to those admitted to general medical wards (7 days) or those not seen by a specialist (5 days).

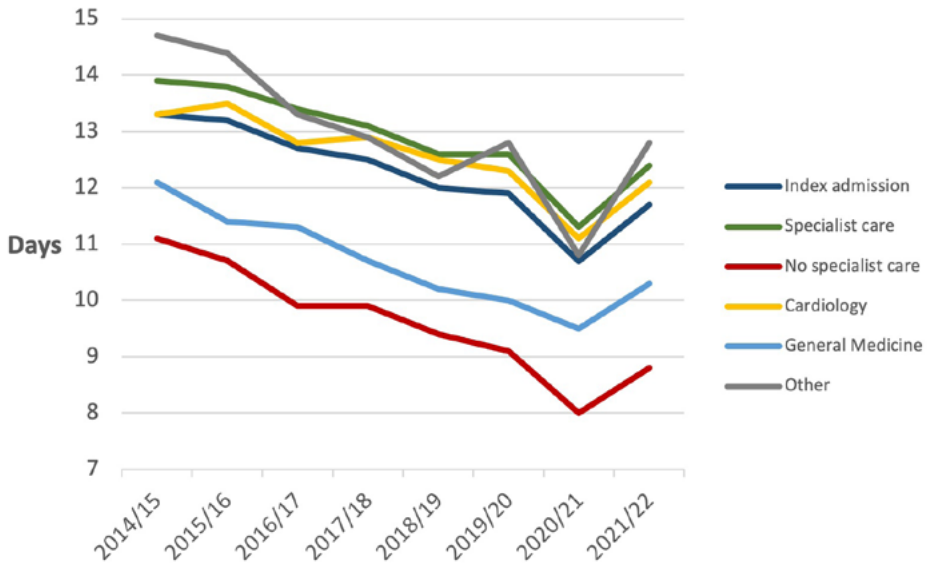


Figure 2.7: Mean length of stay by place of care and access to specialist care in England and Wales, 2021/22 [NHFA data]

2.8 Greater access to review within 2 weeks of discharge is needed

The percentage of patients offered a follow-up within two weeks of discharge, either at hospital or in the community, has fallen from 43% in 2020/21 to 40% in 2021/22.

3 Selected quality improvement metrics

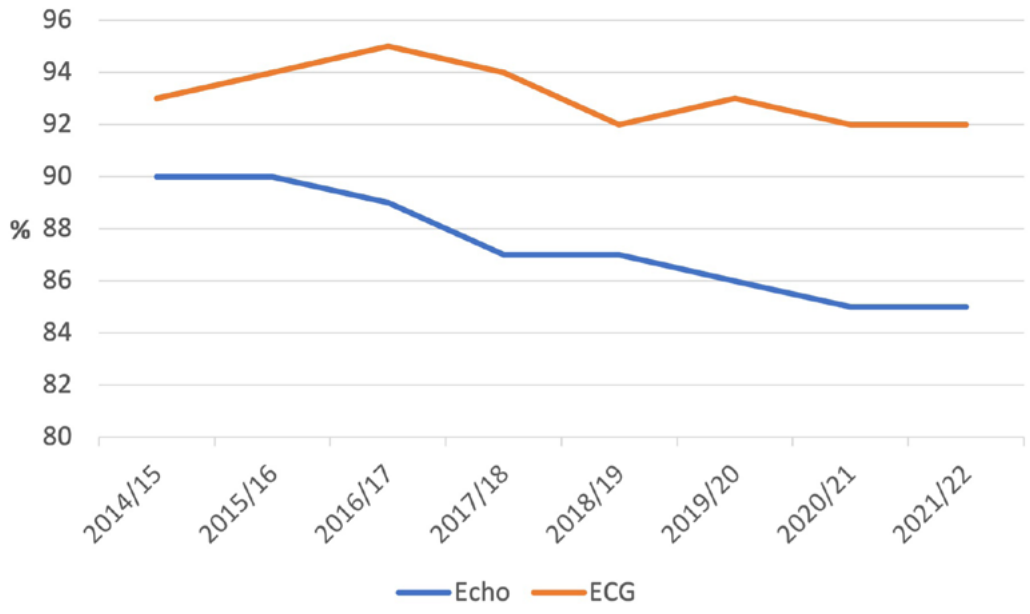
3.1 Overall rates of echocardiography remain high but there is still room for improvement for those not having access to cardiology or specialist care

3.1.1 Overview of QI metric

QI Metric Description/Name	Use of echocardiography for assessment and diagnosis.
Why is this important?	Attempting a diagnosis of HF on clinical symptoms and signs alone results in an incorrect diagnosis in 50%. An accurate diagnosis requires non-invasive imaging (most commonly echocardiography) to confirm underlying cardiac dysfunction. This also allows the underlying HF phenotype, which determines the treatment, to be assigned.
QI theme	Effectiveness, safety.
What is the standard to be met?	There is no accepted national standard. The NICE acute HF guideline recommends an early inpatient echocardiogram, ideally within 48 hours of admission for all new presentations of acute HF. Accepting that some patients may have had a recent echocardiogram, the NHFA standard is for at least 90% of patients to have undergone echocardiography.
Key references to support the metric	NICE Clinical guideline [CG187]. Acute heart failure: diagnosis and management.[2]
Numerator	Number of patients with an index admission with acute HF with an echocardiogram.
Denominator	Number of patients with an admission with acute HF.
Trend	Echocardiography was performed in 85% of patients. This was the same as last year. There is an obvious decline in echocardiography rates over the last eight years. 15% of patients are now not undergoing echocardiography in hospital and/or have no record of an echocardiogram within the last 12 months [Figure 3.1].
Variance	There is considerable variance between hospitals, from 100% to less than 60% [Figure 3.2].

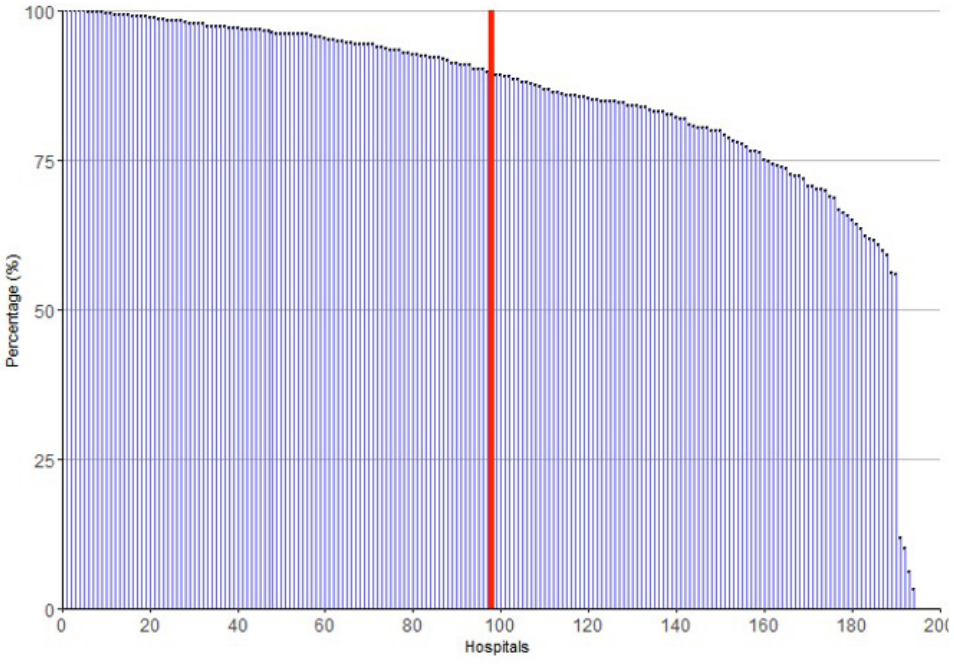
3.1.2 **Audit results**

Figure 3.1: Proportion (%) of patients receiving ECG and echocardiography, 2014/15 - 2021/22 [NHFA data]



Forty-eight per cent of hospitals achieved an echocardiography rate of 90% or more, exactly the same as last year [Figure 3.2].

Figure 3.2: Percentage of patients in England and Wales undergoing echocardiography by hospital, 2020/21 [NHFA data]

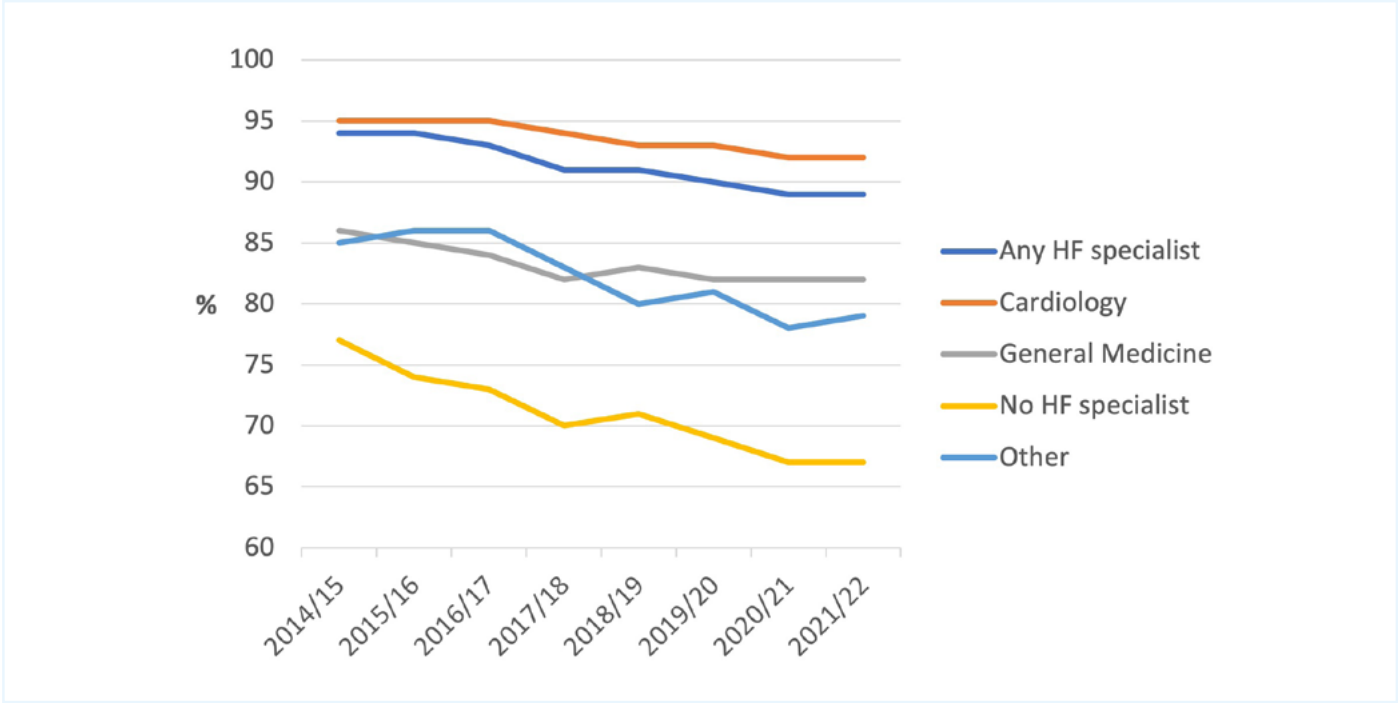


Hospitals to the right of the red line are not achieving the 90% target of patients having echocardiography. Data are from 198 hospitals; hospitals reporting <20 cases are excluded

Figure 3.3 shows that patients admitted to cardiology wards were more likely to have echocardiography than those admitted to general medical wards (92% versus 82%). Patients receiving specialist input to their care had higher rates of echocardiography, no matter where they are admitted.

The new audit dataset enabled identification, for the first time, of a small cohort of 256 patients admitted to ambulatory care units or diuretic lounges. Echocardiography was carried out less often in that setting (74%). This needs to be monitored going forwards so that patients being admitted to these care settings have the recommended access to specialist diagnostics and care.

Figure 3.3: Proportion of patients in England and Wales receiving echocardiography by place of care (or with specialist input regardless of the place of care), 2014/15 - 2021/22 [NHFA data]



There was no change in the echocardiography rate for those aged 75 years or more this year (83%) compared to last. However, it dropped further this year for those not seen by a specialist, to 67% from 69% in 2020/21.

The small gender gap reported last year persists with women being less likely to receive an echocardiogram than men (83% compared with 86%).

3.1.3 Recommendations for those not achieving the standard

Hospitals not achieving the recommended standard for the use of inpatient echocardiography for patients with acute HF should urgently review their clinical pathways and ensure that echocardiography is performed, ideally within the first 48 hrs of admission.

3.1.4 Case study

The Bridgend experience of ensuring early echocardiography for HF patients

We had a fairly good echocardiography department when I was appointed 8 years ago, but at that time the inpatient wait for an echocardiogram was around 3-4 days.

We then undertook a joint working project with industry funding to employ a band 6 specialist HF nurse. She reviewed all acute admissions with suspected heart failure and arranged natriuretic peptide measurement and expedited / requested echocardiography accordingly. This approach showed a reduction in echocardiography waiting time to within 24 hours of admission, which led to reduction in length of stay as the correct diagnosis was made early in the patient admission journey and appropriate treatment initiated early.

With subsequent expansion of the now BSE accredited Department, and support from Dr Cristina Constantin, the echocardiography lead, we then arranged access to "protected slots" for inpatients, where the level of suspicion is particularly high. These patients are also prioritised by the physiologist who undertakes the inpatient list. We are now usually able to obtain the scan within the day the request is made if received before 2pm.

The HF team (either I or one of the registrars) make a point of giving positive feedback to the echocardiographer undertaking the scan emphasising the impact of a timely echocardiogram. I think the importance of this sort of feedback and bi-directional relationships with our echocardiography colleagues are often under emphasised. In my opinion, feedback, that allows our colleagues to see and appreciate the value and impact of their work, is central to the excellence of our service.

Dr Aaron Wong, Consultant Cardiologist, General Physician and Heart Failure Lead at the Princess of Wales Hospital, Bridgend

3.2 Place of Care: More patients should be admitted to a cardiology ward

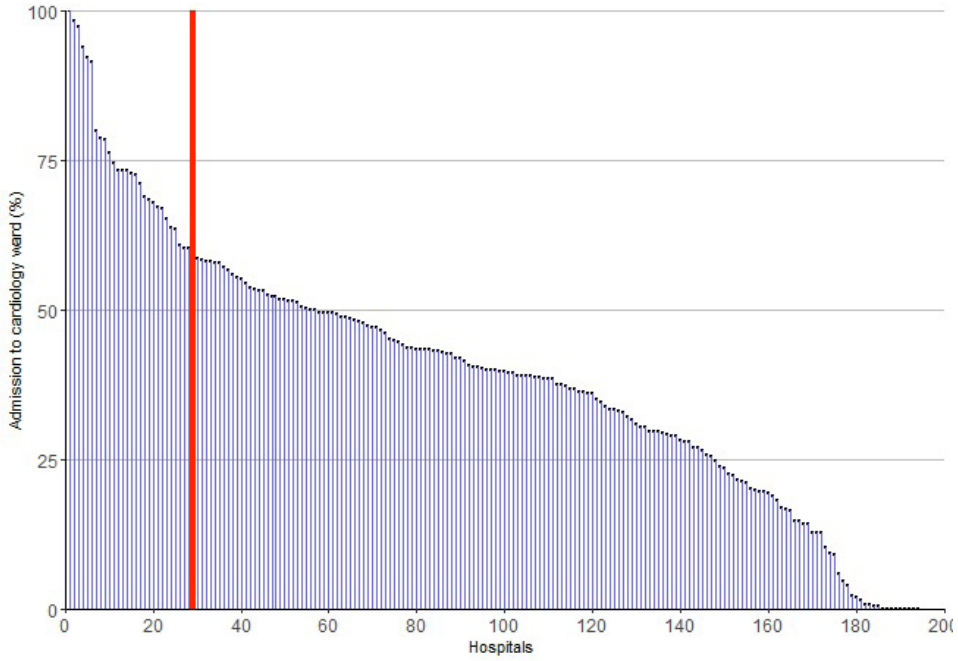
3.2.1 Overview of QI metric

QI Metric Description/Name	Place of care
Why is this important?	Place of care is a key QI for HF as care in cardiology wards is associated with lower in-hospital and subsequent mortality, better treatment for patients with HFrEF on discharge, and more access to specialist care.
QI theme	Effectiveness, safety.
What is the standard to be met?	There is no official standard. The NHFA has recommended improved access to cardiology wards as it is associated with better outcomes. HF patients are among those at highest risk without this access.
Key references to support the metric	NICE Clinical guideline [CG 187]. Acute heart failure: diagnosis and management.[2]
Numerator	All patients admitted with acute HF admitted to a cardiology ward.
Denominator	All patients admitted with acute HF.
Trend	Fewer than half of patients were admitted to cardiology wards. The trend is flat: 47% this year, 48% last year. Access to cardiology wards was lower for those aged over 75 years (42%) that those younger (57%). Similarly, women had less access to cardiology (42%) than men (51%).
Variance	While this may partly reflect a limited number of cardiology beds, there is disconcerting variation between hospitals, from 0% to 100% [Figure 3.4]. COVID-19 enabled hospitals to reorganise services and the learning from this could be applied to improve HF care with cardiology bed access.

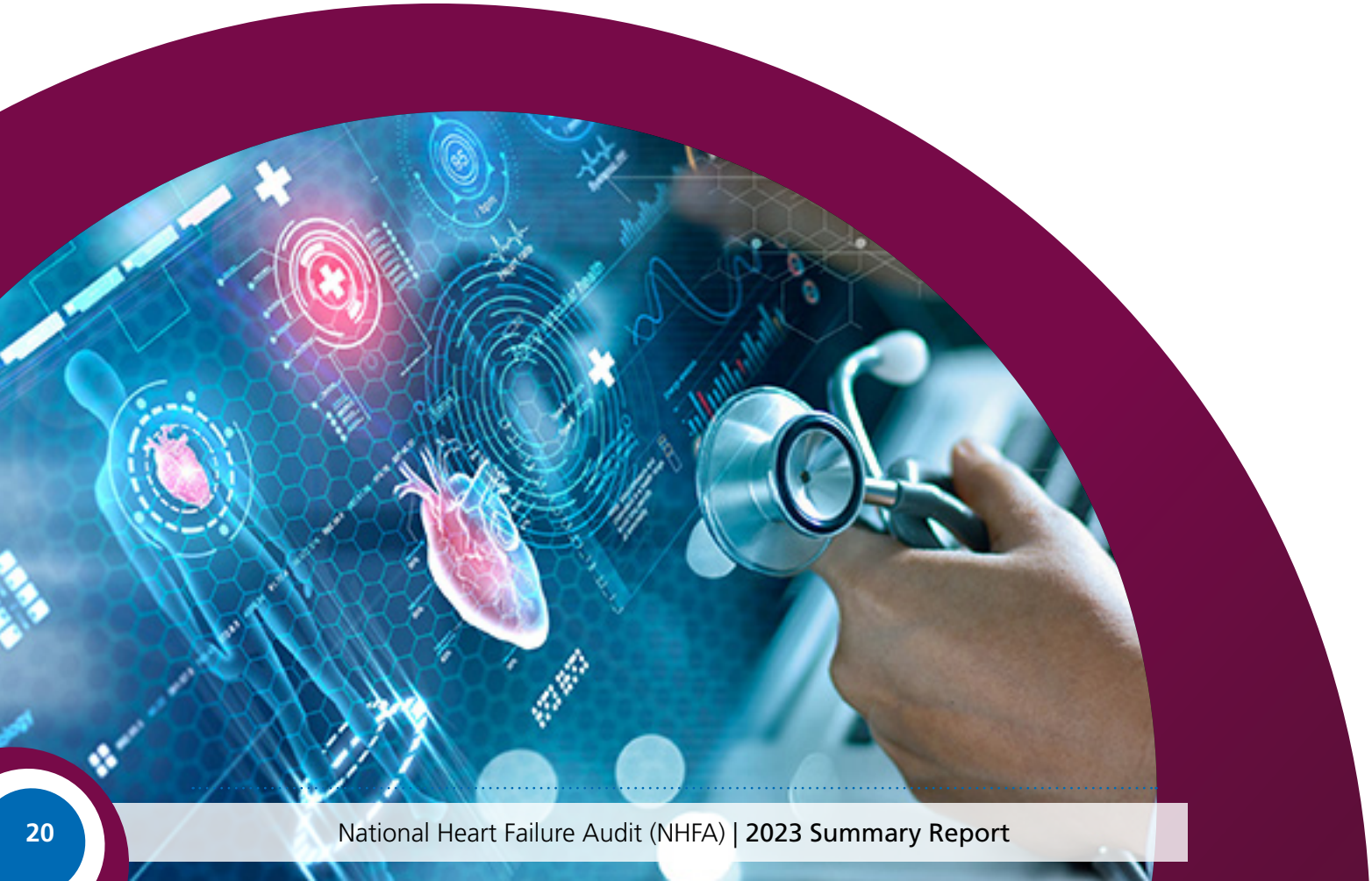
3.2.2 **Audit Results**

Only 14% of hospitals achieved the target of 60% of HF admissions being managed in a cardiology ward. This compares with 13% last year.

Figure 3.4: Percentage of HF patients in England and Wales admitted to a cardiology ward, 2021/22 [NHFA data]

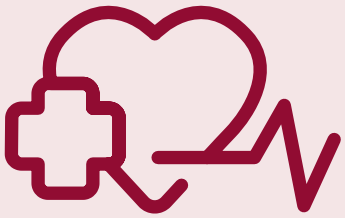


Hospitals to the right of the red line are not achieving the target of 60% of heart failure patients being admitted to a cardiology ward. Data are from 198 hospitals; hospitals reporting <20 cases were excluded



3.2.3 Recommendations for those not achieving the standard

Hospitals should ensure that high-risk cardiac patients have access to a cardiology ward. Heart failure patients often constitute the highest risk category of cardiology patients.



3.3 Specialist multidisciplinary care: more patients on general wards should be seen by the HF team

3.3.1 Overview of QI metric

QI Metric Description/Name	Access to specialist HF care
Why is this important?	Access to specialist HF care (by cardiologists and specialist HF nurses) is associated with lower in-hospital and out-of-hospital mortality, and better treatment of patients with HFrEF on discharge.
QI theme	Effectiveness, safety.
What is the standard to be met?	The audit standard is that at least 80% of patients admitted with acute heart failure should be seen by a member of the specialist HF team. Teams looking after HF patients on non-cardiology wards should be encouraged to refer to the HF team and the HF team need actively to seek out these patients.
Key references to support the metric	NICE Clinical guideline [CG 187]. Acute heart failure: diagnosis and management.[2]
Numerator	All patients admitted with acute HF who are seen by a member of the HF team.
Denominator	All patients admitted with acute heart failure.
Trend	Fifty-nine per cent of hospitals achieved specialist review rates of over 80%. This is a decrease of 6% since last year [Figure 3.5].
Variance	There is considerable variation with many hospitals having fewer than 50% seen by a specialist team [Figure 3.6].

3.3.2 **Audit Results**

Access to specialist care is a very strong recommendation in the NICE acute heart failure guideline:[2]

"All hospitals admitting people with suspected acute heart failure should: provide a specialist heart failure team that is based on a cardiology ward and provides outreach services"; and "ensure that all people being admitted to hospital with suspected acute heart failure have early and continuing input from a dedicated specialist heart failure team".

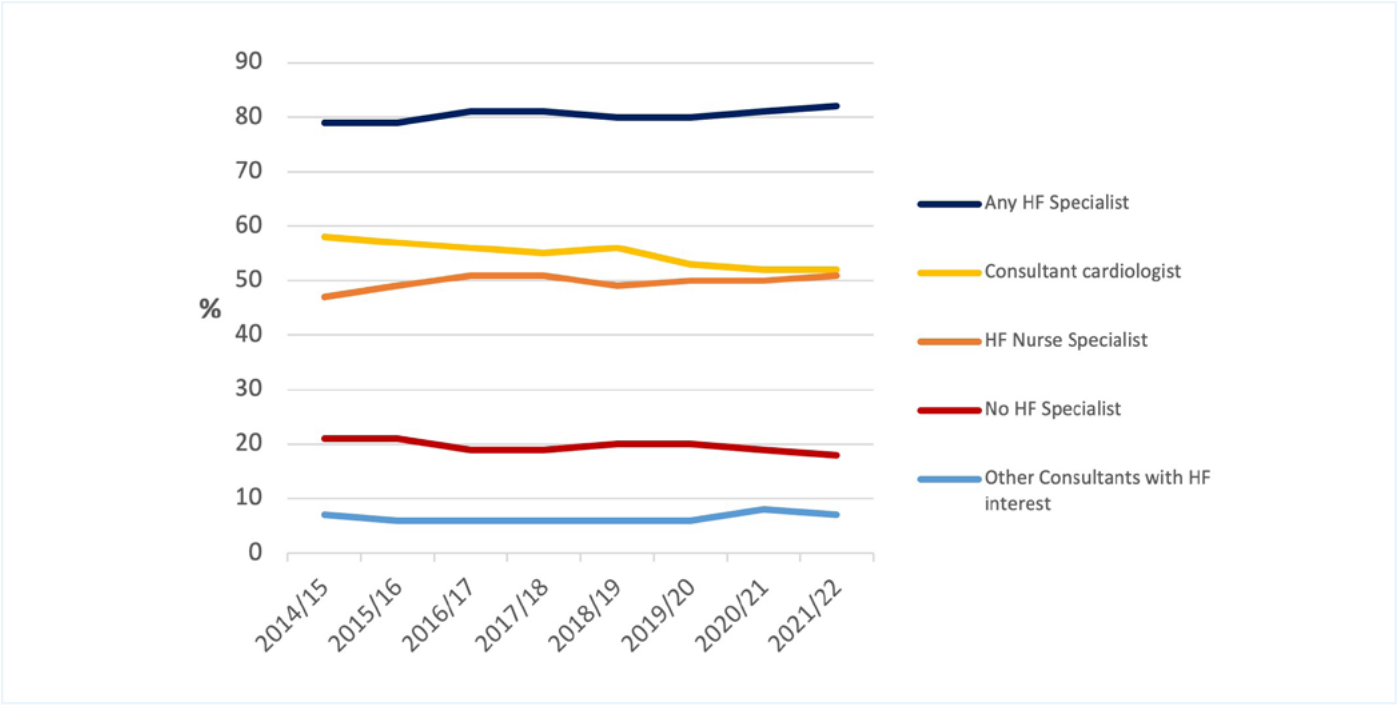
Eighty-two per cent of patients were seen by a HF specialist during the admission to hospital, either a consultant cardiologist, another consultant with specialist HF interest and training (usually a care of the elderly physician) or a HF specialist nurse. Ideally patients are seen by more than one member of the team. Fifty-two per cent of patients were seen by a consultant cardiologist and 50% of patients were seen by a HF specialist nurse during their admission.

For those on cardiology wards, 99% were seen by specialists, 92% were seen by a consultant cardiologist and 52% by HF nurses. This is an increase from the 83% seen by a cardiologist last year and may reflect the reduced need to redeploy cardiologists as we emerge from the pandemic.

Overall, 82% of patients were seen by 'any heart failure specialist', but this included only 72% of patients on general medical wards. The proportion of those seen by specialist HF nurses increased in general medicine wards to 51% (from 46% in 2020/21). Again, this hopefully reflects the repatriation of specialist HF nurses back into specialist HF teams post-pandemic.

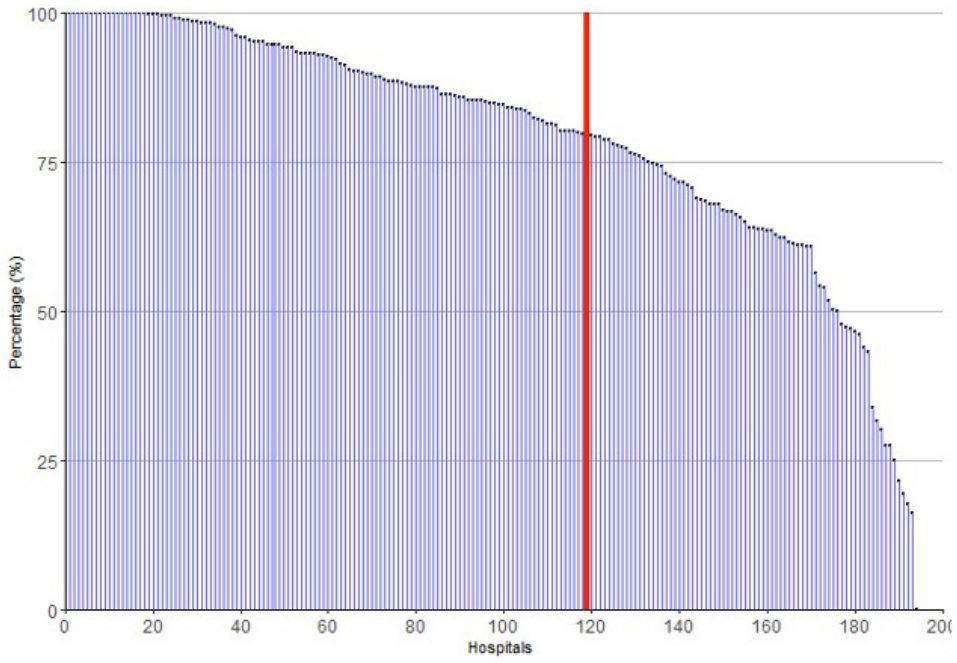
The latest dataset includes a 'specialist HF pharmacist' as an option, and this member of the HF team will be identified in the 2022/23 report.

Figure 3.5: Specialist input for HF patients (%) in England and Wales, 2014/15 - 2021/22 [NHFA data]



Input from a specialist was achieved in over 80% of cases (117 hospitals), 59% of the total in the audit. This is a decrease of 6% compared with last year. This is another QI metric with substantial variability between hospitals and represents significant scope for improvement [Figure 3.6].

Figure 3.6: Inter-hospital variation in percentage of HF patients seen by a specialist, 2021/22 [NHFA data]



Hospitals to the right of the red line are not achieving the target of 80% of HF patients seen by a specialist. Data from 198 hospitals; hospitals reporting <20 cases were excluded.

3.3.3 Recommendations for those not achieving the standard

Hospitals not achieving the standards for ensuring a patient with acute HF is seen by a HF team should review their pathways of care and consider a quality improvement programme to improve on their current performance.

Hospitals that do not have a clinical lead for heart failure should appoint one (ideally a consultant cardiologist with sub-specialty training in HF). The lack of a named lead should feature on their risk register.

Hospitals that do not have access to specialist HF nurses in their hospital team or in the community should urgently seek to appoint them

3.4 Best-practice drug therapy treatment at discharge for HFrEF continues to improve slowly

3.4.1 Overview of QI metric

QI Metric Description/Name	Best-practice treatment at discharge.
Why is this important?	Prescription of ACEI/ARB/ARNI, beta-blocker and MRA are key performance indicators for patients with HFrEF as these drugs are associated with better survival, lower hospitalisation rates and improved quality of life.
QI theme	Effectiveness.
What is the standard to be met?	All patients with HFrEF should be prescribed an ACEI/ARB/ARNI, and beta blocker and MRA unless contra-indicated. QI target for the prescription of ACEI/ARB/ARNI at ≥90%, for BB at ≥90% and at ≥60% both for MRAs and for the combination of all three drug classes.
Key references to support the metric	NICE guideline [NG 106]. Chronic heart failure: diagnosis and management.[1] NICE Clinical guideline [CG 187]. Acute heart failure: diagnosis and management.[2] ESC 2021 Heart Failure Guideline.[3]
Numerator	All patients with HFrEF prescribed each of these drug classes unless there is a contraindication.
Denominator	All patients with HFrEF with a Yes/No answer.
Trend	High aggregate standards were again achieved with 87% of patients being discharged on an ACEI/ARB/ARNI and 90% on a beta-blocker. Further improvements were seen compared to 2020/2021 with 63% on an MRA [Table 3.1]. Some of the increase in renin-angiotensin-aldosterone system (RAAS) inhibitors prescribing may be due to the availability of a new field for ARNI in the revised audit dataset. The most challenging target is the number discharged on all three classes of therapy which has also increased from 54% in 2020/21 to 56% this year [Table 3.1].
Variance	Figure 3.9, Figure 3.10, Figure 3.11 and Figure 3.12 show considerable variation between hospitals in the proportions of patients who are discharged on these medications.

3.4.2 **Audit Results**

Table 3.1 shows that the aggregate QI target for MRAs was at last achieved in 2021/22, so this will be increased to 85% from the next reporting next cycle.

Using data submitted to the revised audit dataset, for the first time this year, we are reporting the proportion of those with HFrEF who are discharged on the angiotensin receptor/neprolysin inhibitor (ARNI), sacubitril valsartan (25%), and the sodium-glucose co-transporter-2 (SGLT2) inhibitors dapagliflozin and empagliflozin (32%).

Table 3.1: Treatment on discharge for HFrEF, 2021/22 [NHFA data]

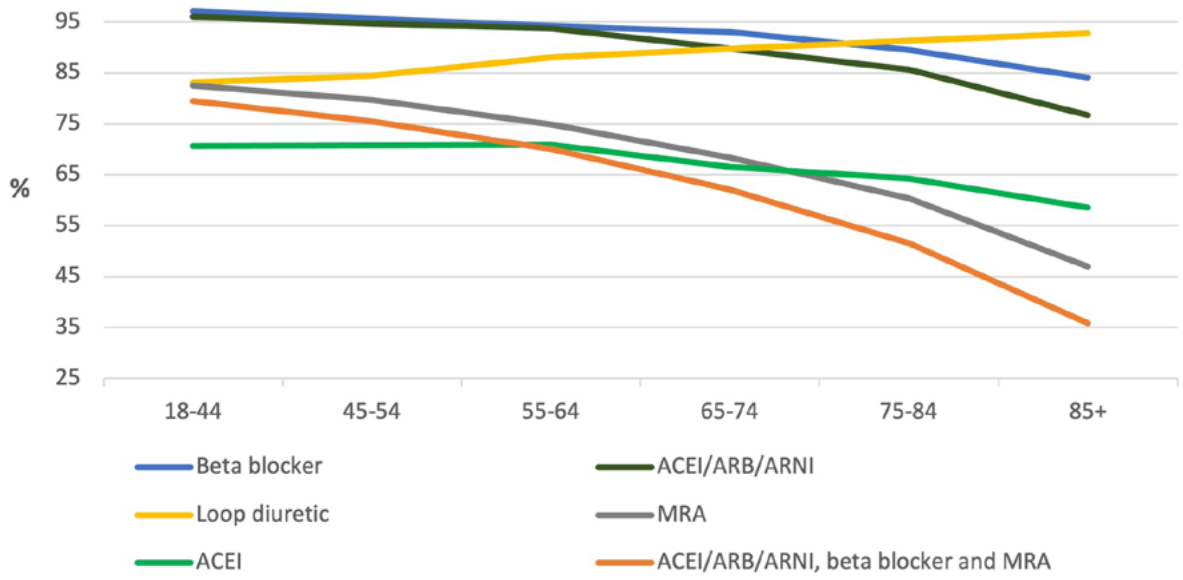
Medication	Total prescribed (%)	Inclusion of unknowns in denominator
ACEI	64.9	52.1
ARB	21.6	13.4
ARNI	24.9	15.9
ACEI/ARB/ARNI	86.7	79.1
BB	90.2	86.4
MRA	62.9	54.9
SGLT2i	32.4	19.1
ACEI/ARB/ARNI, BB and MRA	56.1	46.2
Loop diuretic	90.3	n/a
Thiazide	3.3	n/a
Digoxin	18.9	n/a

The figures for drug prescribing rates have until now always excluded submissions where the hospital responded 'unknown'. Consequently, this has the potential to overstate the number of hospitals reporting 100% prescription rates. For 2021/22, these 'unknown' responses have been included as 'no'. The impact of this in reducing the achieved rates can also be seen in Table 3.1.

We intend to prioritise this analysis in future, which emphasises the importance of making certain that prescriptions at discharge are accurately completed for all cases submitted to the audit.

The differential prescribing of disease-modifying treatment with an ACEI/ARB/ARNI, BB and MRA with age was also seen again this year [Figure 3.7]. The inflexion point for reduction in these drugs is in the 55-64 age group. The problem remains greatest for MRA use. This is an area for urgently targeting better practice in the next few years.

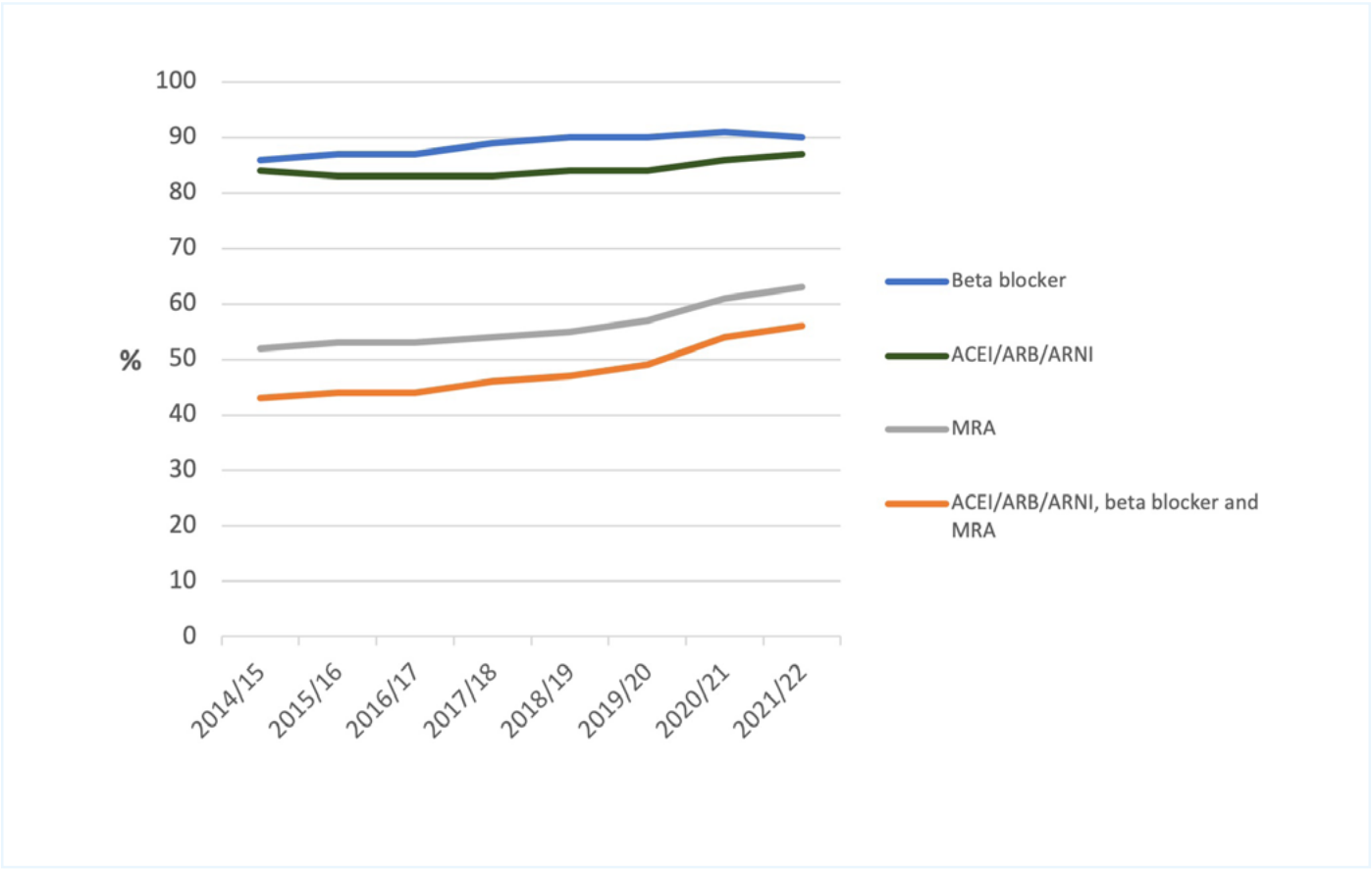
Figure 3.7: Treatment on discharge (% receiving medication) for HFrEF by age, 2021/22 [NHFA data]



Angiotensin Converting Enzyme Inhibitor (ACEI); Angiotensin Receptor Blocker (ARB); Angiotensin Receptor/ Neprilysin Inhibitor (ARNI); Mineralocorticoid (aldosterone) Receptor Antagonist (MRA)

The trends in prescribing of the three classes of disease-modifying medicines reported over the last eight years were either maintained or improved. The data presented here are for patients eligible for the therapies (i.e., after those with contraindications have been removed), so arguably the rates of prescriptions for all three drugs should be approaching 100%.

Figure 3.8: Trends in prescription rates (%) for HFrEF from 2014/15 - 2021/22 [NHFA data]

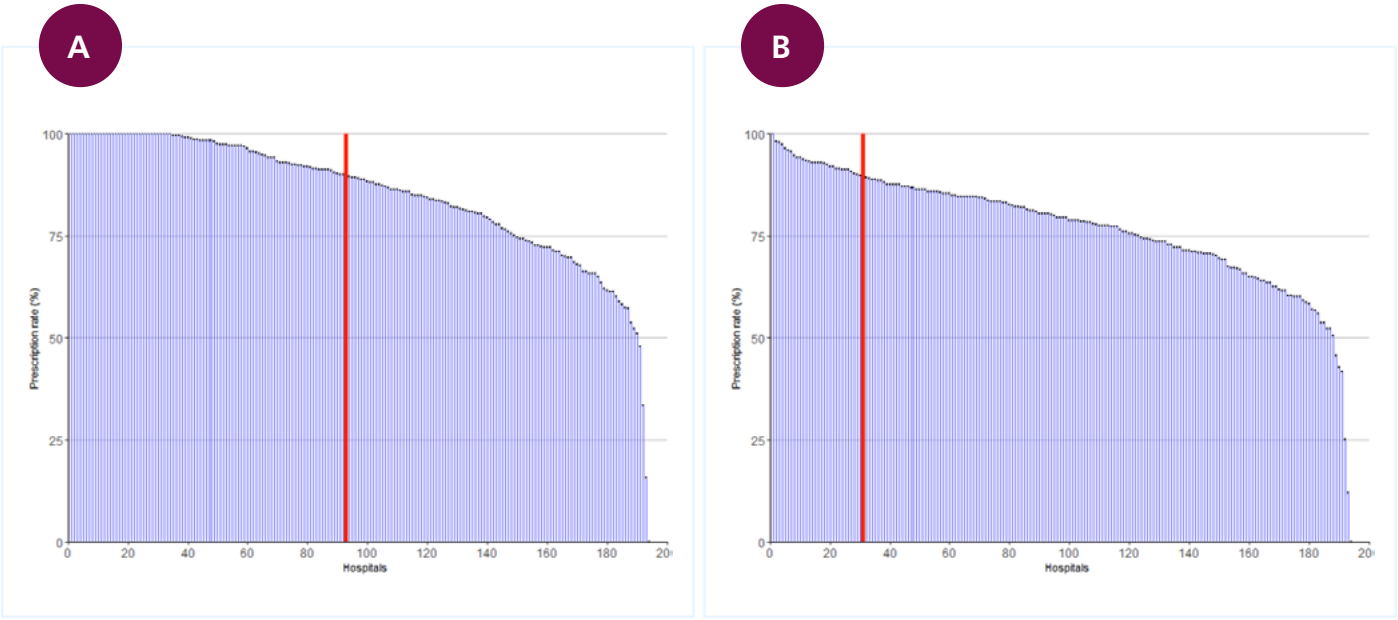


There is significant variation between hospitals in the prescription of these drugs [Figure 3.9, Figure 3.10, Figure 3.11, Figure 3.12]. The percentage of hospitals achieving those standards is even lower when 'unknowns' are not excluded from the calculation (right hand graphs in the figures). As a result of this the proportion of hospitals achieving the targets have fallen for:

- ACEI/ARB/ARNI from 44% to 15%
- BB from 58% to 35%
- MRAs from 55% to 30%.

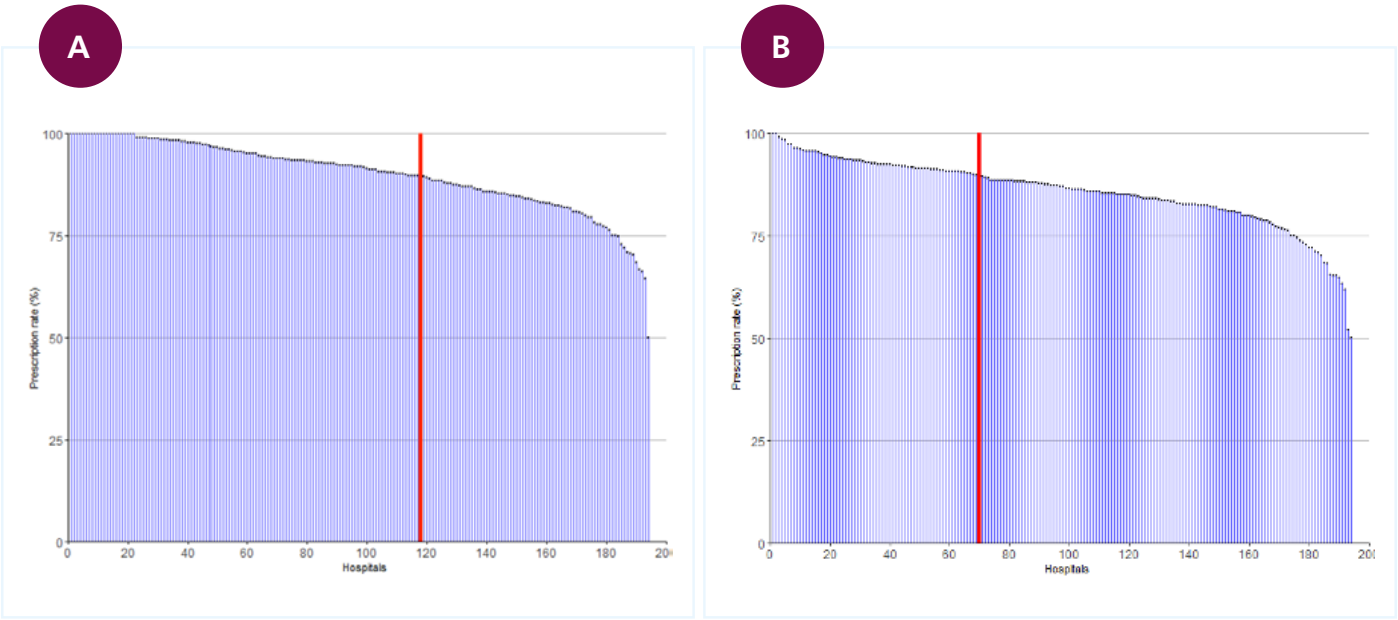
In particular, prescribing rates for the combination of all three drugs classes needs to improve in the inpatient setting.[2] The proportion of hospitals reaching the 60% benchmark has increased from 36% last year to 42% but reduces to 16% when 'unknowns' are included.

Figure 3.9: Proportion of patients (%) with HFrEF receiving an ACEI/ARB/ARNI by hospital, 2021/22 [NHFA data]



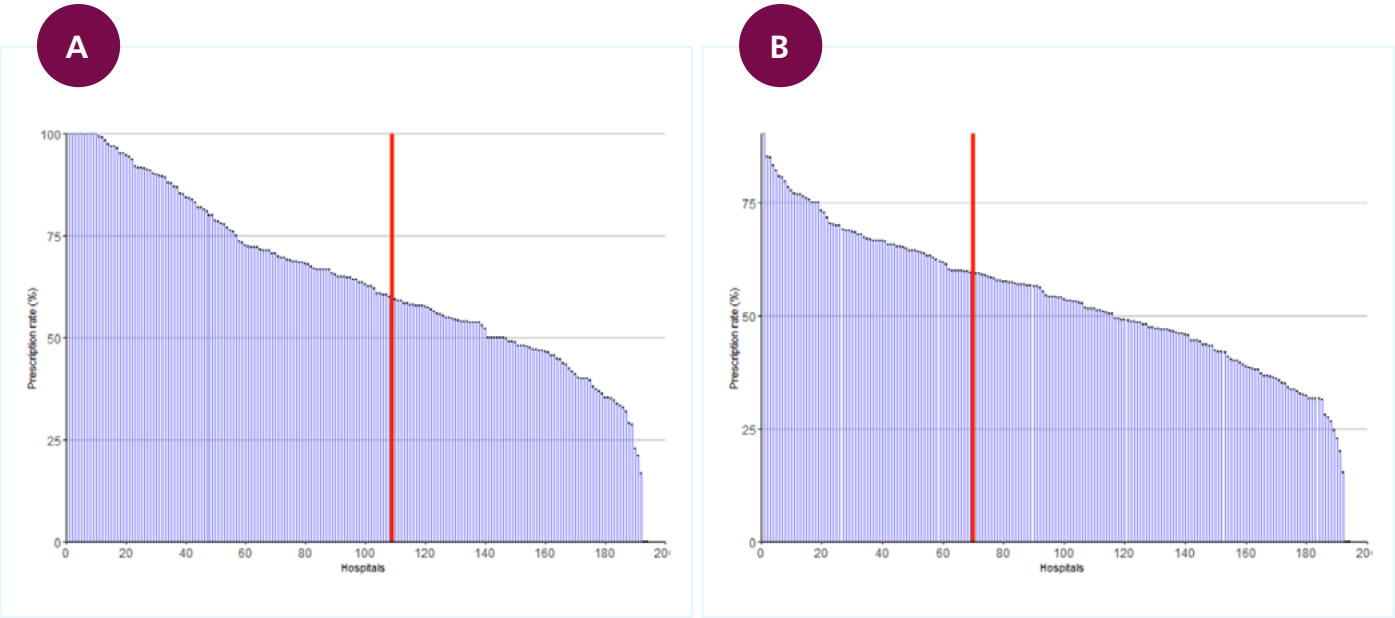
Hospitals to the right of the red line are not achieving the 90% of eligible HFrEF patients receiving an ACEI/ARB/ARNI. 94 (47%) of hospitals achieved this in graph A and 30/198 (15%) in Graph B. Data from 198 hospitals. Hospitals reporting <20 cases were excluded. In graph A (on the left) 'unknowns' are excluded from the denominator, and only those submissions with a definite yes/no entry are included. Data for graph B (on the right) include 'unknowns' in the denominator.

Figure 3.10: Proportion of patients (%) with HFrEF receiving a beta-blocker by hospital, 2021/22 [NHFA data]



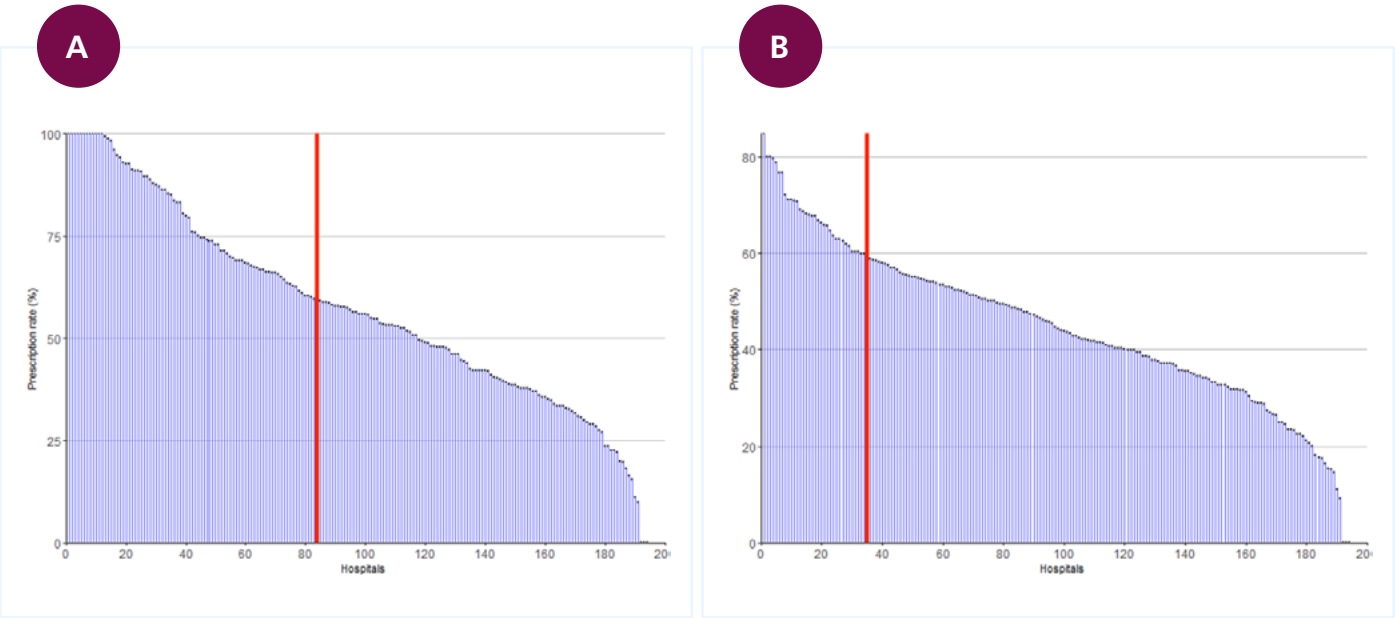
Hospitals to the right of the red line are not achieving the 90% of eligible HFrEF patients receiving a BB. 116 (58%) of hospitals achieved this in graph A and 70 (35%) in Graph B. Data from 198 hospitals. Hospitals reporting <20 cases were excluded. In graph A (on the left) 'unknowns' are excluded from the denominator, and only those submissions with a definite yes/no entry are included. Data for graph B (on the right) include 'unknowns' in the denominator.

Figure 3.11: Proportion of patients (%) with HFrEF receiving an MRA per hospital, 2020/22 [NHFA data]



Hospitals to the right of the red line are not achieving the 60% of eligible HFrEF patients receiving an MRA. 108 (55%) of hospitals achieved this in graph A and 60 (35%) in Graph B. Data from 198 hospitals. Hospitals reporting <20 cases were excluded. In graph A (on the left) 'unknowns' are excluded from the denominator, and only those submissions with a definite yes/no entry are included. Data for graph B (on the right) include 'unknowns' in the denominator.

Figure 3.12: Percentage of HF patients with HFrEF in England and Wales HFrEF receiving all 3 classes of drugs per hospital, 2020/21 [NHFA data]

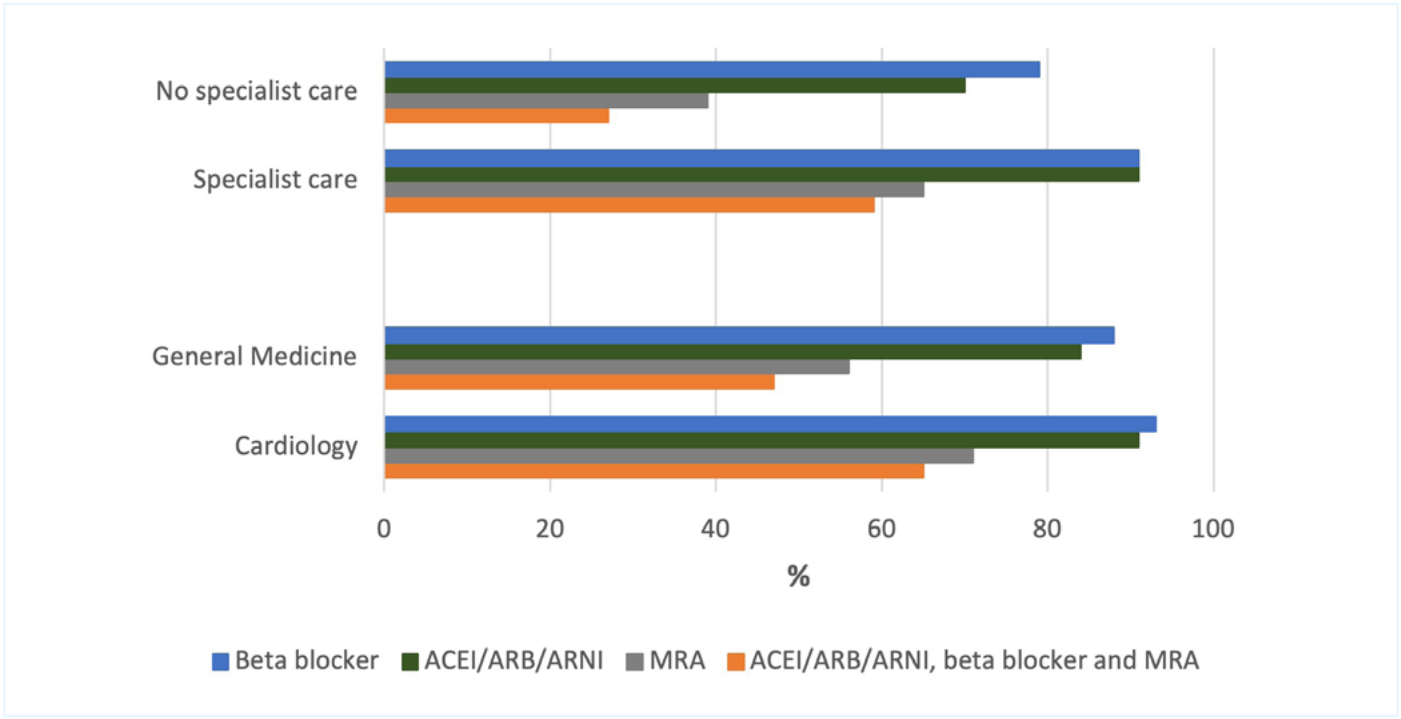


Hospitals to the right of the red line are not achieving the 60% of eligible HFrEF patients receiving an ACEI/ARNI/ARB and a BB and an MRA. 82 (42%) of hospitals achieved this in graph A and 32 (16%) in Graph B. Data from 197 hospitals. Hospitals reporting <20 cases were excluded. In graph A (on the left) 'unknowns' are excluded from the denominator, and only those submissions with a definite yes/no entry are included. Data for graph B (on the right) include 'unknowns' in the denominator.

All of the disease-modifying therapies for HFrEF are prescribed more frequently for those who are treated on cardiology wards or receive specialist care [Figure 3.13]. The audit continues to find that specialist care increases appropriate drug prescription and more should be done to ensure that patients receive best therapy. The rate of prescription of all three disease-modifying medicines in combination improved from 58% last year to 65% on cardiology wards. It has increased much more modestly from 45% to 47% on general medical wards [Figure 3.13].

The proportion of patients prescribed all three medicines increased from 55% to 59% in 2021/22 among those seen by a specialist. It was only 27% for patients not seen by a specialist, irrespective of their ward allocation. This demonstrates that specialist outreach services to other wards improves care.

Figure 3.13: Proportion of cases (%) prescribed disease-modifying-therapy for HFrEF by place of care and access to a HF specialist, 2021/22 [NHFA data]



3.4.3 Recommendations for those not achieving the standard

All patients with HFrEF should receive the disease-modifying drugs that they require unless there is a contra-indication. This can be increased if patients are managed on cardiology wards or are seen by a HF specialist team early during an admission. Those hospitals not meeting the expected standards should perform a clinical pathway review to investigate where improvements can be made.

Hospitals should make every effort to record all those on these medications at discharge and avoid entering 'unknowns' in their audit submissions.

3.4.4 **Case study**

The Southampton experience of introducing a heart failure team and their approach to managing patients admitted to hospital with heart failure (HF)

Fifteen years ago, we introduced an inpatient HF team in Southampton. This was on the background of a poor performance in the 2005 Health Care Commission Audit which identified that 30% of patients hospitalised with HF died on the index admission with only 16% being seen by a cardiologist.

The aim of the team was to provide specialist care wherever the patient presented and was novel at the time. We were able to show on retrospective audit a dramatic impact on survival in the first year of the HF service[1]. We had an inpatient mortality of 6%, compared with the previous six months' mortality of 22%. Baseline characteristics were remarkably similar between the two groups. Importantly the benefit of inpatient care translated into improved outcomes, with a 1-year mortality of 27% (43% in the previous cohort). The major differences between the two groups was that the HF team gave higher doses of diuretics and started patients on more mineralocorticoid receptor antagonists (MRAs), with a marginal increase in ACEI / ARB prescription. Prescription of beta-blockers was not significantly changed.

Today we offer a fully integrated HF team which works seamlessly with our community colleagues. We have many more HF consultants and HF nurse specialists, but the principles remain the same. A hospital admission is an opportunity to get the patient fully decongested and on best medical therapy. Personally, I always start an MRA when I start iv diuretic therapy, as it helps maintain potassium during diuresis. Next in line comes ACEI, ARB or ARNI, with a beta-blocker started when the patient is euvolaemic pre-discharge.

We have always taken the view that it is better to be on small doses of each agent rather than on higher doses of one or two agents. Our challenge now is to achieve the four pillars of therapy prior to discharge, or if we can't achieve this, to ensure early introduction post discharge under the supervision of the HF team. Early community (or hospital) follow-up remains vitally important in establishing stability on best medical therapy and allowing opportunity for early up-titration before assessing the need for device therapy.

The world of HF management has changed a lot in the last 15 years. We have continued to develop, evaluate, and adopt new strategies and innovations throughout. To date, our inpatient HF unit remains an unmet goal, but one we hope to achieve in the next year.

The key remains to do the basics well. We have excellent drug and device therapy, and we need to continue to ensure that HF patients get access to the specialist care they deserve.

Dr Peter Cowburn. Consultant Cardiologist, University Hospital Southampton

1.Masters J, Morton. G, Anton I et al. Specialist Intervention is associated with improved patient outcomes in patients with decompensated heart failure: evaluation of the impact of a multidisciplinary heart failure team. Openheart 2017; 4 (1) e000547.

3.5 Follow up: more patients should be offered specialist follow-up and rehabilitation

3.5.1 Overview of QI metric

QI Metric Description/ Name	Follow-up appointment within two weeks of discharge.	Specialist follow-up alongside access to cardiac rehabilitation.
Why is this important?	People admitted to hospital due to HF should be discharged only when stable and should receive a clinical assessment from a member of a multidisciplinary HF team within 2 weeks of discharge (NICE Quality standard 103).[4] This is a 'high-risk' period when the patient is at increased risk of hospital readmission.	Specialist cardiology and HF nurse follow-up improves morbidity and mortality in HF and reduces likelihood of early readmission. Cardiac rehabilitation is also associated with better outcomes.
QI theme	Effectiveness.	Effectiveness.
What is the standard to be met?	The standard should be 100%.	100% of stable patients fit for discharge should ideally leave hospital knowing when, where and by which member of the specialist HF team they will be reviewed within two weeks. They should also be referred to cardiac rehabilitation.
Key references to support the metric	NICE Quality standard [QS 103]. Acute heart failure.[4]	NICE guideline [NG106] 2018. Chronic heart failure in adults: diagnosis and management 2018.[1]
Numerator	All patients discharged alive after an admission with acute heart failure with evidence of a follow-up appointment within 2 weeks.	All patients discharged alive after an admission with acute heart failure with specialist. cardiology/ nurse follow-up to be seen within 2 weeks.
Denominator	All patients discharged alive after admission with acute heart failure.	All patients discharged alive after admission with acute heart failure.

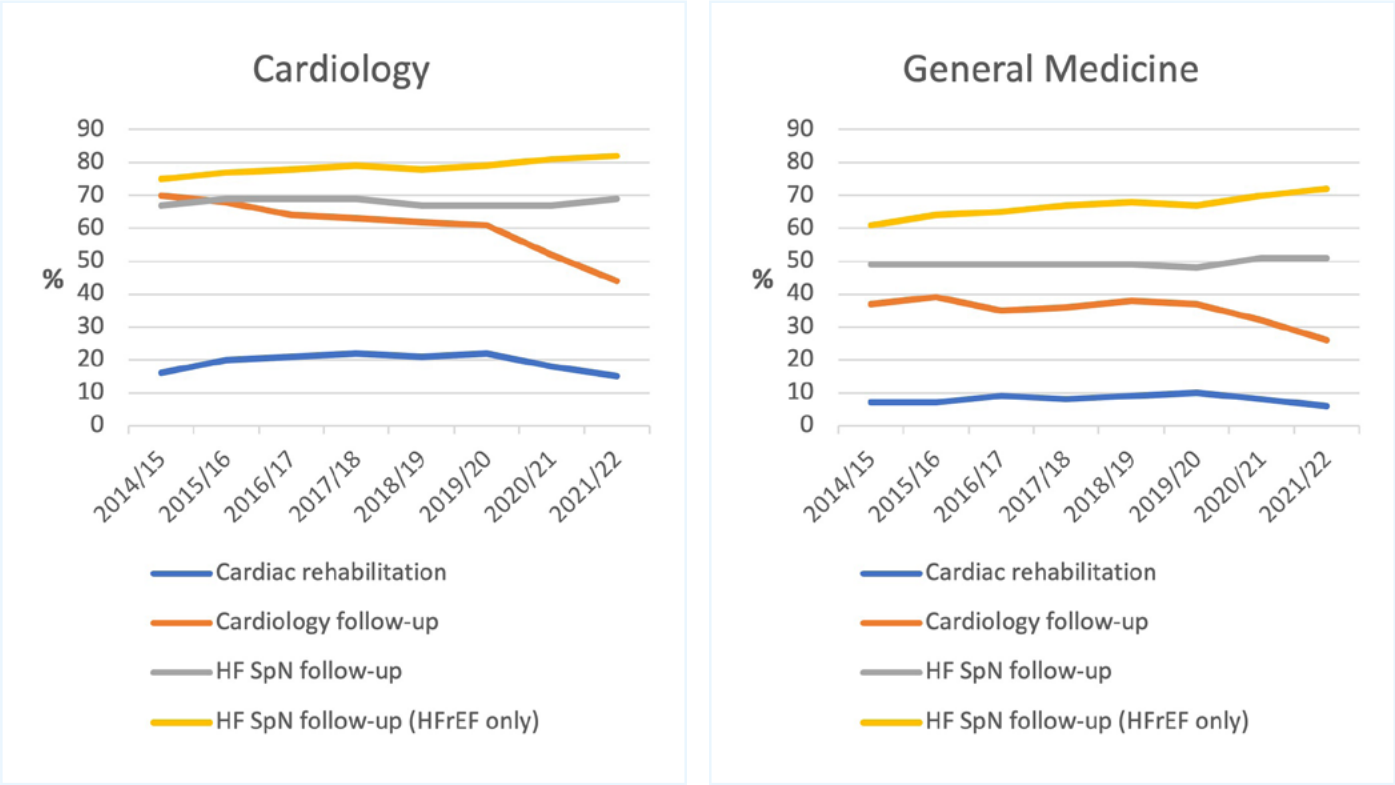
QI Metric Description/ Name	Follow-up appointment within two weeks of discharge.	Specialist follow-up alongside access to cardiac rehabilitation.
Trend	This metric has reduced again this year to 40%, from 43% of patients in 2020/21.	Overall, 32% of those discharged have cardiology follow-up (down 7% from last year), and 58% have HF specialist nurse appointments post discharge (up 11% from last year). The trends for cardiology follow-up continue to fall but HF nurse follow-up is increasing again. This is a key area for future improvement as such follow-up has been demonstrated repeatedly by this audit to be associated with improved outcomes. Overall, just under 10% of patients are referred for cardiac rehabilitation during hospitalization (down 3% from last year). Rates are higher for those cared for in cardiology wards (15%), a decrease of 3% from last year compared to 6% for those seen on general medical wards (trend downwards by 2%). Anecdotally many more are purportedly referred after discharge by community teams; however, the audit does not capture such referrals.

3.5.2 **Audit Results**

The COVID-19 pandemic was associated with a marked reduction in all discharge referrals to cardiology, HF nurses and rehabilitation [Figure 3.14]. That trend persists this year for cardiology-follow-up and rehabilitation, with services resetting more slowly post-pandemic as cardiology deals with the backlog of appointments and procedures.

HF specialist nurse follow-up is increasing though, suggesting that the redeployment of HF specialist nurses during the pandemic has been reversed. As rates of specialist follow-up of any genre are higher for those looked after in cardiology, keeping cardiology specialist care going in hospital as we emerge from the pandemic is clearly vital to improving outcomes.

Figure 3.14: Trends in multidisciplinary HF team follow-up post discharge in England and Wales, 2014/15 - 2021/22 [NHFA data]



The overall percentage of patients referred for cardiac rehabilitation was extremely low at 9.6% in 2021/22, even for those seen on cardiology wards (15%). Like many other aspects of the HF services, rehabilitation was variably suspended, or modified, for some or all of the present cycle which may have deterred referrals.

If hospitals are to achieve the cardiac rehabilitation goals from the NHS Long-Term Plan (ie to be "among the best in Europe, with up to 85% of those eligible accessing [cardiac rehabilitation] care"), there needs to be a dramatic increase in the provision and prescription of cardiac rehabilitation services.

The investigation and establishment of remote rehabilitation services may prove a fruitful avenue for commissioners of services to investigate in order for the service to drive towards meeting NHS 2028 targets.

3.5.3 Recommendations for those not achieving the standard

Patients should be referred for Cardiology & Specialist HF Nurse follow-up, ideally leaving hospital with their first appointment.

Hospitals should review their pathways for referral to cardiac rehabilitation to allow greater access and uptake for HF patients.

4 Future direction

Maintaining and improving the use of audit data to support the delivery of healthcare is crucial. The 2021/22 HF data has been invaluable in confirming the essential role of specialist nurses and cardiologists working from a cardiology ward as we emerge from the COVID-19 pandemic.

In developing the audit into the future, the following areas will be prioritised to improve access to specialist heart failure care and drive down inpatient mortality rates.

Improving data quality and completeness

A key aim will be to drive up the quality of data submitted to the audit, including encouraging all hospitals to use the revised dataset for this.

The incorporation of a new data completeness tool will further improve data quality. Hospitals will be able to access this on-line to act as a stimulus for more complete data submission on the use of echocardiography and for the aggregate prescribing of ACEI/ARB/ARNI plus BB plus MRA in HFrEF.

We are aware that sodium-glucose co-transporter-2 inhibitors (SGLT2i) now have a Class I recommendation for the treatment of HFrEF in many guidelines.[3] As this is only captured in the most recent dataset change, we will report on this class of drugs and their combination with ACE/ARNI plus BB plus MRI, as new QI metrics, once most centres are complying with the data completion requirements.

In this report we presented the analyses of drug prescriptions for HFrEF in the usual manner, alongside analyses where 'unknown values' are replaced with a "no" to try and minimise the use of exception reporting. We will continue to report in this way with the intent of minimising exception reporting over time to improve the quality of reporting.

Identifying and understanding variance

In next year's report, we will be presenting 30-day mortality by hospital using a validated risk-adjusted mortality model that is currently being finalised for publication. This will look at statistical variations in mortality at hospital level, attributable to the hospital care as distinct from patient characteristics. This should lead to improvements in both inpatient quality of care, outcomes at one year and, critically, mortality for patients with HFrEF, for whom there is strong evidence that leaving hospital on disease-modifying treatments improves outcomes.

The poor uptake of cardiac rehabilitation, which has been impacted seriously by COVID-19 and its aftermath, will remain a key QI theme. A recurring response from those completing the HF audit submissions regarding the low numbers receiving cardiac rehabilitation is that referrals are being made **after** discharge from hospital. The separate Cardiac Rehabilitation Audit will be aligned with other NCAP Audits to allow us to assess this, taking advantage of the larger and arguably more representative cohort of cases than is currently included in the NHFA data.

In addition, hospitals will be urged to reduce the variability in access to high quality HF care for older people and women.

More detailed exploration of the data

As the audit has now become one of the largest of its type in the world, there are three featured areas we need urgently to explore further with the ambition of identifying future good practice. First is the relationship between length of stay and outcomes. This hopefully will lead to advice as to the optimal range of length of stay for HF patients.

A second focus will be regional variation in delivery of specialist care. We aim to produce 'heat maps' for key quality indicators to identify geographical inequalities in the care of HF patients.

Finally, we have the opportunity to explore the effects of the prescribing of newer agents for HFrEF, HFmrEF and HFpEF with implementation of our new dataset.[7,8] In addition to examining the associations between ARNI and SGLT2i with outcomes, we will also be reporting on the use of direct-acting oral anticoagulants (DOACs) for patients with AF and HF.

Making the data more available for research

For data governance purposes, the NCAP audits are now hosted within NHS England (NHS Arden and GEM Commissioning Support Unit). This should enable streamlining of the process to access audit data for research use. At the same time, increased linkages with the other NCAP datasets will add to the granularity, quality and understanding of the HF data that this audit was designed to document and improve.

5 References

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6 Thanks and acknowledgements

We would especially like to thank the contribution of all NHS Trusts, Welsh Heath Boards and the individual nurses, clinicians and audit teams who collect data and participate in the audit. Without this input the audit could not continue to produce credible analysis, or to effectively monitor and assess the standard of heart failure care in England and Wales.

This report was written and compiled by Theresa McDonagh (Domain Clinical Lead), and Suzanna Hardman (Deputy Lead) with help from Andrew Clark, John Cleland, Gethin Ellis, Richard Mindham, Mark de Belder, Kathy Simmonds, Aminat Shote, Sarah Ajayi and Shenaka Singarayer, with input from the National Heart Failure Audit Domain Expert Group, whose members, in addition to those mentioned above, include: Roy Gardner, Dawn Lambert, Denise Hockey, Gemma Baldock-Apps, Janine Beezer, Ailsa McGregor, Jim Moore and Sophie Welch. We are very grateful to Ross Pow of Power of Numbers for his expertise in design, formatting and editing of the report.

Data extraction and linkage was carried out by the NICOR Informatics team. Data cleaning and analysis was performed by Aminat Shote.

Specialist clinical knowledge and leadership is provided by the BSH and the audit's clinical lead, Professor Theresa McDonagh. The strategic direction and development of the audit is determined by the Domain Expert Group. This includes major stakeholders in the audit, including cardiologists, a pharmacist, a GP, the BSH, Heart Failure specialist nurses, clinical audit and effectiveness managers, patient representatives, NICOR Developers and HQIP.

National Institute for Cardiovascular Outcomes Research (NICOR) is hosted by NHS Arden & GEM Commissioning Support Unit (Arden & GEM). NICOR is funded by NHS England and the GIG Cymru (NHS Wales) to collect and report patient information nationally in order to improve the quality of care received in hospital by patients with heart disease.

Please go to www.nicor.org.uk for more information.

Email: nicor.auditenquiries@nhs.net

This report is available online via the NICOR website.

This report was published on 8 June 2023.

National Institute of Cardiovascular Outcomes Research (NICOR)

NICOR is a partnership of clinicians, IT experts, statisticians, academics and managers who, together, are responsible for the National Cardiac Audit Programme (NCAP) and a number of health technology registries, including the UK TAVI registry. Hosted by Arden & GEM CSU, NICOR collects, analyses and interprets vital cardiovascular data into relevant and meaningful information to promote sustainable improvements in patient well-being, safety and outcomes. NICOR is funded by NHS England and the GIG Cymru (NHS Wales).

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British Society for Heart Failure (BSH)

The BSH is a national organisation of healthcare professionals which aims to improve care and outcomes for patients with heart failure by increasing knowledge and promoting research about its diagnosis, causes and management.

NHS Arden and GEM

NHS Arden & GEM is a Commissioning Support Unit (CSU) working across the health and care sector in England to provide a range of services including procurement and contracting, service transformation, business intelligence, business support and clinical support. Its ability to draw upon expertise from over 1000 staff, working in multidisciplinary teams, enables the CSU to help healthcare commissioners and providers navigate and implement the change needed to improve patient care and outcomes. Arden & GEM's clients include more than 70 customers including Integrated Care Boards, NHS England, Integrated Care Systems, Primary Care Networks, NHS provider trusts and local authorities.

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NHS England

NHS England leads the National Health Service (NHS) in England. NHS England provides national leadership for the NHS. Through the NHS Long Term Plan, we promote high quality health and care for all, and support NHS organisations to work in partnership to deliver better outcomes for our patients and communities, at the best possible value for taxpayers and to continuously improve the NHS. We are working to make the NHS an employer of excellence and to enable NHS patients to benefit from world-leading research, innovation and technology.

GIG Cymru (NHS Wales)

NHS Wales is the public funded National Health Service of Wales providing healthcare to some 3 million people who live in the country. The Welsh Government sets the Health Care strategy and NHS in Wales delivers that strategy and services via the seven Local Health Boards, three NHS Trusts and two Special Health Authorities. The NHS has a key principle which is that good healthcare should be available to all.

National Cardiac
Audit Programme

NICOR

National Heart Failure Audit (NHFA)

2023 Summary Report (2021/22 data)