

National Heart Failure Audit

Initial report for the audit period ending April 2007

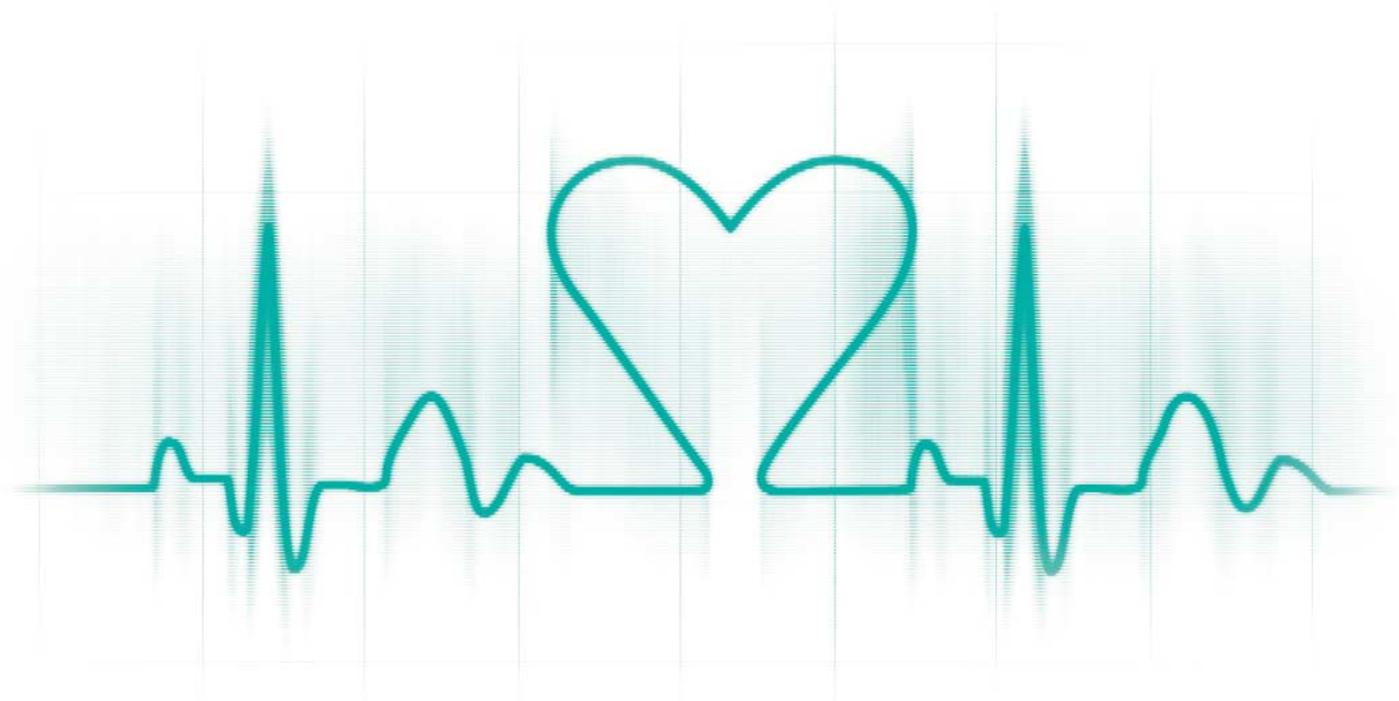


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National Heart Failure Audit Initial report for the audit period ending April 2007

This first report for the National Heart Failure Audit presents key findings and recommendations from the pilot phase undertaken between October 2006 and March 2007. The data included in this report was submitted during this period. Aimed at healthcare professionals, managers and clinical governance leads, the report describes how the audit has been modified to support a national roll-out.

The report also describes how participation will help providers and commissioners measure standards of care against evidence-based best practice and national standards, identify gaps in care and improve services.

Electronic copies of this report can be found at: www.ic.nhs.uk. If you have any queries or comments on this publication, please contact The Information Centre for health and social care 0845 300 6016 or email: enquiries@ic.nhs.uk quoting document reference 23070107.

For further information about this report, email: enquiries@ic.nhs.uk or contact:

National Clinical Audit Support Programme (NCASP)
The Information Centre for health and social care
1 Trevelyan Square
Boar Lane
Leeds
LS1 6AE

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I. Acknowledgments

The National Heart Failure Audit is managed by The Information Centre for health and social care (The IC) and has been commissioned by the Healthcare Commission and developed in partnership with British Society for Heart Failure.

Throughout the development a number of key individuals have provided considerable contribution. These include the Heart Failure project team:

- Theresa McDonagh, Henry Dargie and John Cleland, Clinical Leads and Members of the British Society for Heart Failure.
- David Cunningham, Senior Project Manager.
- Andrew Donald, Systems Developer.
- Nadeem Fazal, Service Manager.
- Tracy Whittaker, Project Manager.

Above all we would like to thank pilot sites and individual users for their support in developing the National Heart Failure Audit.

II. Foreword

Heart failure is now the commonest cardiovascular cause of emergency admission to hospital. Re-admission rates are among the highest for any common condition in the UK, standing at 25 per cent for a 60-day period. Mortality from heart failure during and after an acute admission is high, at around 10 per cent over the same time period. And heart failure services represent a significant cost to the NHS, coming in at an estimated £625 million each year.

There is a huge evidence base which demonstrates that effective diagnosis, co-ordinated specialist care and treatment can dramatically reduce mortality, admissions and readmissions, improve patient quality of life and reduce cost. Up to now, though, heart failure services have suffered from a lack of good, reliable, comparable audit information. One of the major criticisms of the Healthcare Commission's recent service review centred on the shortage of evidence of clinical audit.

It is therefore encouraging to see how much progress has been made in developing this National Heart Failure Audit. It is intended to redress the current and historic omission, and should act as a stimulus for improvement in heart failure care.



A handwritten signature in blue ink that reads "Roger Boyle". The signature is written in a cursive, flowing style.

Professor Roger Boyle

National Director for Heart Disease and Stroke

1.0 Executive Summary

1.0 Executive summary

The National Service Framework (NSF) for Coronary Heart Disease (2000) sets national standards of care relating to coronary heart disease, including providing better care for people with heart failure. The National Institute of Clinical Excellence (NICE) has issued guidelines on the management of heart failure in primary and secondary care (2003). Both play an important role in improving health standards and ensuring high quality care is available and accessible to all who need it.

1.1 Heart failure

Heart failure is a clinical syndrome characterised by symptoms such as breathlessness and fatigue, and signs of fluid retention such as swollen ankles. It is caused when the heart is unable to pump enough blood fast enough to meet the needs of the body. It develops over time as the pumping action of the heart grows weaker. Most cases are due to coronary heart disease and damage following a heart attack. A third of cases are caused by high blood pressure, which causes the heart's muscular wall to thicken, making it less flexible and unable to pump blood properly.

Heart failure affects around 1 per cent of people in the UK, increasing steeply with age to about 7 per cent in men and women over 75-84 years and 15 per cent of those aged 85 and above. The number of patients with heart failure is set to rise in the next twenty years. This is due to the combined effects of improved survival after a heart attack and an ageing population.

Survival rates are worse than for breast and prostate cancer, with annual mortality ranging from 10 per cent to 50 per cent depending on severity, and a high risk of sudden death. Patients with heart failure experience a poor quality of life, with over a third experiencing severe and prolonged depressive illness.

Heart failure is one of the largest sources of emergency hospital admissions and a major contributor to readmission rates and occupied bed days, equating to almost 5 per cent of all emergency medical admissions. There is good evidence that appropriate diagnosis, treatment and ongoing support can improve quality of life, help reduce morbidity and mortality and reduce hospital admission. The Healthcare Commission's 2005 report

on implementation of the NSF found that progress in improving heart failure services had been slow. The follow up service review published in 2007 found that substantial progress had been made in the last two years. The review reported improved access to diagnostics and key treatments for patients with heart failure. However, one of the enduring findings of the review was the lack of clinical audit data with fewer than 20 per cent of organisations able to meet the NSF criteria for auditing the delivery of heart failure services.

National clinical audits play a key role in supporting improvement by monitoring implementation of national evidence based guidance and measuring progress towards meeting national standards. Lack of high quality data makes it difficult for organisations to compare their performance in order to assess whether patients are receiving the best possible care and to identify areas where they need to improve services.

1.2 National Heart Failure Audit

The National Heart Failure Audit is run jointly by The Information Centre for health and social care (The IC) and the British Society for Heart Failure, and funded by the Healthcare Commission. The audit focuses on the care and treatment of patients admitted to hospital with heart failure. The main purpose of the audit is to measure the process of care and clinical outcomes enabling comparisons between hospitals in order to bring about improvement where necessary. Participating in the audit has many benefits. It:

- helps care providers to measure their standards of care against best practice and national standards, identify gaps in their care provision and improve their services.
- improves the quality of life of patients with chronic heart failure and support for their carers.
- supports the local healthcare system's ability to meet the Public Service Agreement targets for long term conditions by avoiding unnecessary hospital admission and reducing length of stay.
- supports Primary Care Trusts by providing information to support the effective commissioning of services.

- acts as a resource for healthcare professionals in both primary and secondary care to assess whether NHS Trusts are meeting the standards set by the Department of Health and assessed by the Healthcare Commission.

This report summarises progress during the first year of the National Heart Failure Audit and includes key findings from the pilot phase of the project undertaken between October 2006 and March 2007. Aimed at healthcare professionals, managers and clinical governance leads, the report describes how the audit has been modified to support a national roll-out. The report also describes how participation will help providers and commissioners measure standards of care against evidence-based best practice and national standards, identify gaps in care and improve services.

1.3 Summary of key findings and main recommendations

This report contains information from 719 patients from seven hospital units, relating to 691 initial visits and 120 follow up visits.

The pilot phase highlighted a number of challenges and amendments that need to be addressed before the audit is rolled out at a national level. These are set out in full in the main report but include the following points.

- To ensure audit data is representative of care in all organisations, it is essential that the quality of care for all relevant patients admitted to hospital is recorded. The number of cases submitted by each site varied considerably, ranging from 3 to 439 cases. Feedback from sites suggested this was more likely due to the combined effect of a large dataset and limited resources for data input rather than actual variation in caseload. In light of this,
 - The audit tool has since been redesigned and now consists of a small core mandatory dataset, as well as a more comprehensive optional dataset for more developed services. The smaller dataset will also encourage other units to opt-in and participate in the audit when rolled out nationally.
 - The complexity of the care pathway may also make it difficult to identify patients. As the audit progresses The IC will be able to compare HES clinical data with the number of patients submitted to the National Heart Failure Audit to monitor progress in capturing all data.
 - The core mandatory dataset reflects key investigations and interventions highlighted in the NSF and NICE guidelines. The number of completed fields varied and considerable effort will be required to ensure hospitals submit to a satisfactory standard of data completion. For example, the NSF and NICE guidelines emphasise the importance of a confirmed diagnosis of heart failure and access to key investigations such as electrocardiogram (ECG) and echocardiogram. In the pilot, ECG was recorded in 29 per cent of cases and 18 per cent of cases received an echocardiogram. Likewise, the NSF and NICE set out guidelines on the use of drugs such as ACE inhibitors, diuretics and Beta-blockers to enhance life expectancy, improve symptoms and help reduce hospital admission. Information on key drug therapies was reported in only 31 per cent of cases increasing to 50 per cent for newer cases. This will have significant implications for the production of national comparative data.
 - In response to this, key investigations and interventions have been made mandatory. In addition, the database will include 'pop-ups' providing instant feedback on the level of data quality and completeness.
- In a small number of cases, information may be unknown at the time of data input. However, clinical practitioners are required to keep clear, accurate, legible and contemporaneous patient records which report the relevant clinical findings, the decisions made, the information given to patients and any drugs care and treatment prescribed, together with the patient's response to treatment.
- The audit toolkit supports the process by offering an 'unknown response' and the facility to return, edit and update the record on completion of the record when the information becomes available. In addition to its role in clinical audit, participation in the National Heart Failure Audit could offer the added benefit of a vehicle for auditing record-keeping.

2.0 Introduction to the National Heart Failure Audit

2.1 Background to heart failure

Heart failure is a complex syndrome that can result from any structural or functional cardiac disorder that impairs the ability of the heart to function as a pump to support physiological circulation. The syndrome of heart failure is characterised by symptoms such as breathlessness and fatigue, and signs such as fluid retention.

Heart failure occurs in around 1 per cent of the adult population rising to 7 per cent in those aged over 75 years and 15 per cent for those aged 85 and over¹. Most cases of heart failure are due to coronary heart disease (approximately 70 per cent) and about a third result from hypertensive heart disease. Although there has been an overall decline in mortality from coronary heart disease, the number

of patients with heart failure is increasing². This is due to an ageing population combined with improved survival rates after a heart attack but with patients left with residual left ventricular dysfunction.

In 2001, over 11,000 deaths due to heart failure were officially recorded in the UK. However, the number of deaths directly attributed to heart failure is likely to be an underestimate of the actual number of deaths it causes. Guidance given on death certificates, that heart failure is not a cause but a mode of death, discourages doctors from recording heart failure as the underlying cause of death. This means that other causes of death, such as coronary heart disease, are more commonly given as the cause of death.

Figure 1: Deaths from heart failure, by sex, age and country, 2001, United Kingdom

	All ages	Under 35	35-44	45-54	55-64	65-74	75-84	85 & over
England and Wales								
Men	3829	8	10	26	103	467	1493	1722
Women	6573	9	6	19	70	391	1918	4152
Total	10402	17	16	45	173	858	3411	5874
Scotland								
Men	205	0	0	1	4	42	68	90
Women	470	0	1	0	4	37	104	324
Total	675	0	1	1	8	79	172	414
Northern Ireland								
Men	169	0	0	1	6	29	58	75
Women	270	1	0	0	4	25	88	152
Total	439	1	0	1	10	54	146	227
UK								
Men	4203	8	10	28	113	538	1619	1887
Women	7313	10	7	19	78	453	2110	4628
Total	11516	18	17	47	191	991	3729	6515

Notes: ICD code (10th revision) 150

Sources: Office for National Statistics (2002) Mortality Statistics: Cause Series DH2 no.27. The Stationery Office: London; General Register Office (2002) Annual Report 2001. General Register Office: Edinburgh; General Register Office (2002) Annual Report 2001. Statistics and Research Agency: Northern Ireland.



www.heartstats.org

2.2 Patient outcomes

This has significant implications for patient outcomes and NHS resources. For patients, survival rates are worse than for breast and prostate cancer, with annual mortality ranging from 10 per cent to 50 per cent depending on severity, and a high risk of sudden death. Newly diagnosed patients have a 40 per cent risk of dying within a year of diagnosisⁱⁱⁱ. Patients with heart failure experience a poor quality of life, with over a third experiencing severe and prolonged depressive illness.

2.3 Impact on services

Providing services to patients with heart failure costs the NHS an estimated £625 million per year. Heart failure places a significant demand on hospital facilities and resources through hospital emergency admissions and readmissions. It accounts for 5 per cent of medical admissions, while the readmission rate for heart failure has been estimated to be as high as 50 per cent over 3 months^{iv}.

2.4 The evidence base

There is good evidence that appropriate diagnosis, treatment and ongoing support can improve quality of life and help reduce morbidity and mortality^v. The National Service Framework (NSF) for Coronary Heart Disease (CHD)^{vi} emphasises the need to develop a systematic approach to the diagnosis, investigation, treatment and ongoing support of people with heart failure throughout the NHS. Evidence-based clinical guidelines^{vii} published by the National Institute for Health and Clinical Excellence aim to assist health professionals in clinical decision making.

2.5 Variation in practice

In a national review of CHD services, the Healthcare Commission found that despite significant progress in implementing the NSF, progress in meeting the heart failure standards had been slow (2004)ⁱ. In response the Healthcare Commission undertook a service review of heart failure services to assess the performance of local services against the NSF standards and NICE recommendations. The results, published in July 2007, indicate that significant progress has been made in the last two years although there is still variation across the country (2007)^{ix}. However, one of the key issues for the

review was that fewer than 20 per cent of organisations could meet all the audit criteria listed in the NSF. The deadline for meeting this standard was 2003. This makes it difficult to compare practice with clinical standards and so make a case for service improvement.

2.6 The Audit

The National Heart Failure Audit aims to provide national comparative data to help clinicians and managers improve the quality and outcomes of their services by assessing achievement against NSF targets and NICE guidelines for heart failure on an ongoing basis.

The provision of comprehensive and high quality services for patients with heart failure is complex. A multidisciplinary approach is advocated often involving healthcare professionals from both primary and secondary care as well as involving social care services. It requires good coordination at all stages of the patient pathway. Such complexity poses a number of challenges and an audit that encompasses all organisations would be extremely large and potentially unwieldy, and would be difficult to evaluate. This being the case, The Information Centre for health and social care and the British Society for Heart Failure have chosen to focus initially on auditing care within secondary care with a view to extending into primary care in the near future. The need to extend the scope to primary settings has also been highlighted by the Healthcare Commission (2007)^{ix} and will be the focus of the second phase of the project.

The first objective of the audit is to identify the percentage of people admitted to hospital with confirmed heart failure who have quality of care recorded. A second objective is to describe current clinical practices in heart failure diagnosis, care and treatment, and to explain variation in practice using data on patient characteristics and healthcare provider identity. A third objective is to describe patient outcomes following diagnosis.

Hospitals that consistently achieve above average results will be identified, allowing other centres to adopt their successful methods in order to improve the quality of care and survival rates for patients with heart failure across the United Kingdom.

As the audit will assess achievement against many of the NSF requirements and NICE recommendations, participating in the audit has many benefits:

- access to national comparative data allows clinicians to examine the management of patients with heart failure, improve the management of patients with chronic heart failure, and improve the quality of life and outcomes for patients with chronic heart failure
- improving services for heart failure and the effective management of heart failure has the potential to impact on the Public Service Agreement target to reduce emergency bed days
- audit results are a resource for healthcare professionals in both primary and secondary care to assess whether their hospitals are meeting the standards set by the Department of Health and assessed by the Healthcare Commission.

2.7 Organisation of the Audit

The National Heart Failure Audit is run jointly by The Information Centre for health and social care (The IC) and the British Society for Heart Failure (BSH). The audit has been commissioned by the Healthcare Commission and in the first instance will run for two years until March 2008. Work is underway to take the second phase of the project forward which will include ongoing audit within secondary care and extending the audits into primary and community care.

2.8 The British Society for Heart Failure

The British Society for Heart Failure (BSH) is a national organisation of health care professionals dedicated to improving heart failure outcomes in the UK. It is a charitable organisation and functions as an affiliated group of the British Cardiovascular Society. As part of the BSH strategy to improve patient care in heart failure, several of its board members have worked with The IC to design a national audit dataset for heart failure. The BSH project steering group have collaborated with The IC during the development and design of the heart failure dataset and database and the pilot phase of the audit providing clinical input and direction.

2.9 Audit and the Healthcare Commission

The National Heart Failure Audit has been commissioned by the Healthcare Commission. The Healthcare Commission is responsible for carrying out independent, authoritative and patient-centred assessments of the performance of each local NHS organisation. The Healthcare Commission recognises that participation in clinical audits and outcomes monitoring is an indication of good clinical governance and will be used in the Annual Health Check. Participation by trusts in national audits is amongst the information used to risk profile trusts and identify which should receive inspection visits, as part of the NHS core standards cross-checking process.

Participation in national clinical audit is also a requirement in the Wales Assembly Government's healthcare policy document, Designed for Life.

2.10 National Clinical Audit Support Programme (NCASP)

The Information Centre for health and social care (The IC) exists to collect, analyse and distribute facts and figures for health and social care communities in England. The National Clinical Audit Support Programme (NCASP) within The IC runs a programme of national audits in a number of disease areas including cancer and heart disease. The audits aim to improve the treatment of patients and improve patient care and outcomes. Each audit offers reliable information to help health professionals continually measure and improve care by comparing practice to specific standards and national trends. The heart disease audits look at various conditions as well as aiming to link audits together to follow a patient's treatment and outcomes throughout their lifetime. Further information about the clinical audits can be accessed via The IC website: (<http://www.ic.nhs.uk/our-services/improving-patient-care>).

The advisory groups for most of these audits include representatives from the wider professional bodies and from patient groups wherever possible. Current reports on the audits may be found at: <http://www.ic.nhs.uk/our-services/improving-patient-care/more-about-the-audits/audit-reports>.

2.11 Heart Failure Application

The National Heart Failure Audit application uses IBM Lotus Notes® and IBM Lotus Domino® as constituents for its software infrastructure. IBM Lotus Notes® and IBM Lotus Domino® are industry leading, client-server, collaborative document-management products incorporating robust security features, and have been widely adopted for use in the commercial sector.

Use of the heart failure application requires connection to NHSnet or the internet. It is installed by an auto install CD with minimal local IT system changes required.

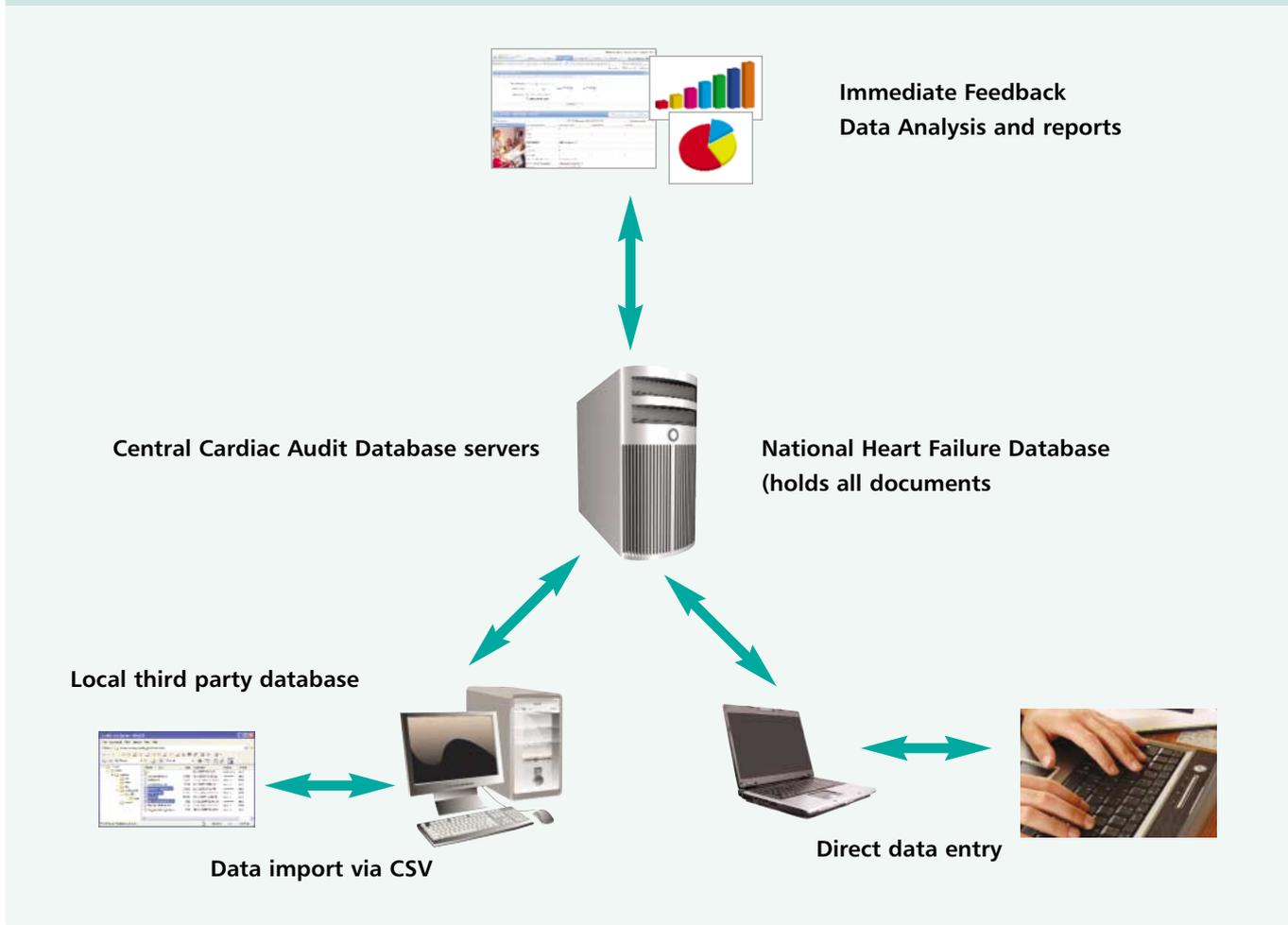
IBM Lotus Notes® allows documents to be defined for data entry and display and treats collections of documents as 'databases'. Each document can be populated with all the design elements familiar with web users.

Each hospital accesses the heart failure database via the Central Cardiac Audit Database (CCAD) portal and has the ability to create a local encrypted replica of the database so that response times are not subjected to local network performances (Figure 2).

Replication is automatically scheduled, every time you open or close the database.

Opening a database allows users to see all the documents to which they have authorised access, and in turn allows the creation of new documents, either by directly inputting the data or by importing data from third party systems, or by editing existing information. Once data has been entered into the hospital local heart failure database that database is then synchronised with the central heart failure database so that data can be analysed to provide immediate feedback.

Figure 2: National Heart Failure Database Infrastructure overview



2.12 Heart Failure application security and patient confidentiality

Security mechanisms are designed to ensure only authorised users access information on the Heart Failure application database. Users only see records submitted by their own organisation (unless permission is given for them to view other organisations' data from other trusts and cardiac networks), and published information contains only comparative analysis figures. Several levels of security are built into the system.

- **ID security:** the Heart Failure application is accessed through use of an IBM Lotus Notes® ID, and that ID can be set to expire or have its access terminated, thus preventing unauthorised users from accessing the system. A complex password is required to access the IBM Lotus Notes® ID (and thus, the CCAD application itself) and that password can be set to expire after a given period forcing the user to change it regularly.
- **Server security:** the central (server-based) Heart application database replica is also protected by server security so that no unauthorised persons can obtain access to it or replicate data to it.
- **Application security:** access to the IBM Lotus Notes® database is controlled by a database Access Control List (ACL). This ensures both non-repudiation, (a user cannot deny that they have accessed data), and that users and organisations only have access to their own records. Users may be given 'read only' or editing rights. Users can delete records if they have the correct permissions and if there are no child documents relating to that record.

The application is also encrypted so that if any unauthorised person were to somehow obtain the hard drive upon which the Heart Failure application exists, they would also need an authorised ID file (and knowledge of its password) to access it.

All system database accesses are recorded in a system log file that can be audited in the event of suspected security threats or data misuse.

2.13 Patient confidentiality

Audit data is subject to strict rules of confidentiality. NCASP continues to work with the Healthcare Commission and the Patient Information Advisory Group (PIAG) to ensure that support is provided under Section 60 of the Data Protection Act for the collection and use of patient identifiable data. All current NCASP audits have PIAG support. Hospitals send the data to the National Heart Failure Audit application via a secure connection to the NHS secure network, (NHSnet) and internet (access via an ISP is through Port: 1352 on the Internet. This is not Port: 80 (WWW access) which has known security flaws), where it is securely stored on a highly encrypted national computer database. Once captured, the data is only accessible to people who store and analyse the data. Patients can choose to opt-out of the audit, such that their details will not be stored or used for any purpose by the audit.

3.0 Audit progress

During 2006:

- the heart failure dataset and data application were developed and circulated to members of the British Society for Heart Failure for feedback.
- data integrity and validation mechanisms were built into the application.
- data extraction tools were built into the audit application so that sites can download and analyse data.
- data import tools were built in to the database to allow hospitals to submit data using local third-party systems.
- documents about the National Heart Failure Audit have been produced and include:
 - an application guide (user manual).
 - a quick start guide which contains simple instructions to help users with the system.
 - guides to the constitution and format of an upload file in csv or xml format.
- several workshops were held to provide support and advice to the pilot sites.
- the technical helpdesk provided support to the pilot sites.
- The IC demonstrated the National Heart Failure Audit at the British Cardiac Society annual conference (June 2007).
- the heart failure audit toolkit was piloted between May 2006 and April 2007 in seven sites across England and Scotland. The next section describes the key findings from this period and makes recommendations for developing the audit toolkit and audit process in preparation for national roll-out.

4.0 Findings

4.1 Quality of care

Measures of the quality of care received by patients are required to drive and monitor improvement. Access to key investigations, treatments and interventions, length of hospital stay and mortality are all indicators of the quality of heart failure services.

Eleven centres expressed an interest in contributing to the pilot phase of the project although four postponed contribution until the audit was rolled out nationally. As a result, seven centres contributed data between October 2006 and April 2007. The sites were based across England and Scotland and are listed in Figure 6 (section 4.2.3). Information from 719 patients was submitted to the audit, of which 691 were initial visits and 120 follow up visits.

4.1.1 Patient demographics: Age, gender and ethnicity

The incidence of heart failure is gradually increasing partly due to the ageing population. The prevalence of heart failure increases sharply with advancing age and there are differences in onset between men and women. Up to age 74, more men than women have heart failure. This reverses at ages above 75, when slightly more females have heart failure than males.

This pattern is reflected in the early findings which showed slightly more cases of men (n= 354; 51.2 per cent) than women. The mean age at initial visit was 76 years although there are differences between men and women with women being older at initial visits (79.4 years) than men (72.9 years).

4.1.2 Diagnosis: access to key investigations

The NSF and NICE guidelines emphasise the importance of having a confirmed diagnosis of heart failure because many of the symptoms are similar to those of other conditions such as asthma. If heart failure is suspected, a number of tests (such as electrocardiogram, chest x-ray and various blood tests) are recommended. If heart failure is not ruled out, echocardiography is recommended to confirm and identify the cause.

Electrocardiogram (ECG) was recorded in 29 per cent of cases. Echocardiography was recorded in 18 per cent (n=124) of cases, of which 63 per cent were reported as having left ventricular dysfunction.

Whilst the overall level of data completeness was poor, the results showed that new cases are more likely to receive key investigations such as ECG and echocardiography (Figure 3).

Figure 3: Reporting rates of key investigations for heart failure

Year	ECG recorded	Echo recorded
2006	16%	7%
2007	86%	70%

4.1.3 Care and treatment: Access to drug therapies

People with heart failure due to left ventricular systolic dysfunction need to receive optimal doses of certain drugs to improve symptoms, enhance life expectancy and help reduce hospital admissions. Key drugs include ACE inhibitors, diuretics and Beta-blockers. Prescribing these drugs in the right doses is a key element of the NSF and NICE guidelines.

At the time of the initial visit, information about drug therapies was recorded in 31 per cent of cases. This improved for follow up visits with approximately 50 per cent of cases recording information about drug therapies (Figure 4).

Of the cases where drug therapy was recorded, approximately half of the patients (51.9 per cent) were prescribed ACE inhibitors and just under half (45.2 per cent) prescribed Beta blockers (Figure 5). In the follow-up visits, prescribing rates rose for both ACE inhibitors (75 per cent of cases) and Beta-blockers (69 per cent of cases) increased. To compare this with the national average, the Healthcare Commission found that nationally, only 33.4 per cent of patients discharged with heart failure, were prescribed beta-blockers, although rates for individual trusts ranged from 11.1 per cent to 66.7 per cent ^x.

Figure 4: Percentage of cases recording evidence based treatment

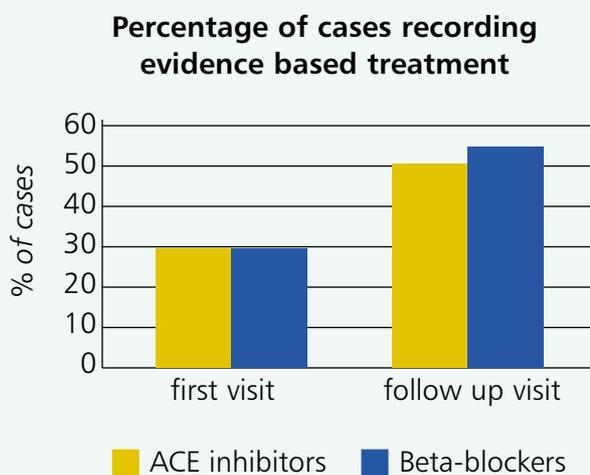
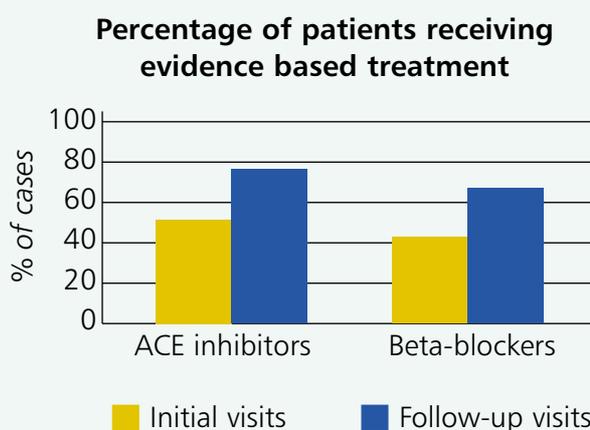


Figure 5: Increased prescribing rates of ACE inhibitors and Beta-blockers in follow-up visits



4.1.4 Care and treatment: Implantable cardioverter-defibrillators (ICDs)

NICE (2007)* recommends that implantable cardioverter defibrillators should be considered for patients with heart failure who are no worse than Class III of the New York Heart Association functional classification of heart failure.

Very few cases (n=9) provided information about device therapies and is to be expected as the guidance was only recently published. NICE also acknowledge that implementation will require an increase in the number of cardiologists and clinical staff trained in cardiac resynchronization therapy, and in the number of implantation centres. As a result, NICE has advised

the Department of Health that full implementation within the NHS is likely to take 18 months. The National Heart Failure Audit can play a key role in monitoring implementation of this guidance and in the effective use of ICDs within the NHS.

4.1.5 Care and treatment: regular monitoring

Heart failure drugs require careful titration and monitoring. NICE guidance^{viii} recommends that all patients with chronic heart failure require monitoring on at least a six monthly basis. Monitoring should include:

- a clinical assessment of functional capacity, fluid status, cardiac rhythm, and cognitive and nutritional status
- a review of medication, including need for changes and possible side effects
- serum urea, electrolytes and creatinine.

The National Heart Failure Audit tool is designed to capture information from both initial visits and all follow up visits. Additional records for each subsequent visit or contact can be added to the database. Information from 120 follow up visits were submitted to the audit during the pilot phase.

4.1.6 Patient outcomes: Length of stay

Length of hospital stay may be a very simple and effective way of measuring quality of care. It reflects whether a patient’s condition has been managed effectively and medications have been initiated and titrated in a methodical way. This was not measured as part of the pilot phase but will be included for the national roll out. In addition to the data collected as part of the audit, The IC will link audit data with Hospital Episode Statistic (HES) data to measure length of stay.

4.1.7 Mortality

Access to high quality heart failure services will also have a positive impact on inpatient and post-discharge mortality rates.

Factors affecting mortality are patient’s age, general state of health and stage of heart failure as well as the quality of care. Mortality data must therefore be adjusted for case mix. Hospitals in deprived areas, where death from all causes may be greater regardless

of whether they have access to quality services, will appear to have worse outcomes if there is no adjustment for casemix. The audit aims to collect in-hospital mortality data via the hospital submissions. During the pilot phase, 19 deaths were reported in 719 patients, 9-207 days after initial visit (median 162 days).

Post-discharge mortality will be recorded by linking audit data with national mortality data.

4.2 Implementation issues

Pilot sites were asked to evaluate the dataset, software application and audit process. Questionnaires were sent to each site and were completed by the primary contact.

4.2.1 Installing the software

The IT infrastructure worked well and centres felt well supported by the technical helpdesk. However, several sites experienced initial difficulties when installing the Lotus Notes® software. The main reason was that local IT departments were prioritising resources to work on Connecting for Health. However, all hospitals participate in the Myocardial Infarction National Audit Project (MINAP) which is also supported by Lotus Notes®. As part of the national rollout, The IC will provide information on existing licence arrangements and availability of The IC technical support helpdesk.

4.2.2 Dataset fields

The aim was to produce audit tools that would be useable and applicable to health professionals working in a range of health care settings. The dataset used for the pilot phase was comprehensive and reflected the NSF standards and NICE recommendations across the entire patient pathway. The dataset consisted of 231 fields including 20 mandatory fields. The fields were categorised into one of the following records: Patient registration, Initial visit, Follow-up, Unscheduled event, and Life status.

Feedback from the pilot sites suggested a number of changes were needed to the heart failure dataset and IT application before the audit was rolled at a national level. These include requests for:

- specific changes and additions to the existing data items. These tended to focus on additional clinical fields

- the capacity to access sequential data to monitor changes over time e.g. changes in drug dosage
- data definitions and 'help pop ups' in the database to provide guidance on completing the data fields
- a facility to export the audit data to produce a summary or discharge letter.

The clinical group agreed that additional clinical fields would not be added at this stage but to review as part of the evaluation process. A facility to monitor change over time and a facility to produce GP discharge summary and letters has been built into the database. Data definitions and help prompts have also been incorporated and will be updated on an ongoing basis in response to user feedback.

4.2.3 Data completeness

Data completeness should be 90 per cent or above for each of the mandatory data fields. Figure 6 shows variation in the level of data completeness for the five key standards of care outlined in the NSF and NICE guidelines.

Feedback from the pilot sites highlighted a number of factors likely to affect data completeness. These include the size of the dataset and limited resources for data input, complexity of the heart failure care pathway, access to clinical information, and feedback about data quality. A number of approaches have been taken to support improvements in data quality before the audit is rolled out at a national level.

- The size of the dataset has been reviewed giving priority to the requirements of the NSF^{vi} and audit criteria provided by NICE^{vii}. The new design includes a small core dataset that meets the key investigations and interventions but with the flexibility of collecting more information as required.
- Identifying patients admitted with heart failure can be problematic especially for services that do not have designated heart failure specialist staff. To support implementation, the audit will take a staged approach. In the first six months, hospitals will be asked to submit as a minimum, the first ten consecutive cases of heart failure admitted per month, increasing to all heart failure admissions by 31 January 2008. This will give hospitals time to identify the most effective process for identifying patients within their organisation.

Figure 6: Field completeness (as of April 30 2007)

Hospital	Number of records	% NHS number	% Postcode	% ACE Inhibitors	% Beta-Blockers
England					
Harrogate District Hospital	3	33	33	67	67
Hull Royal Infirmary	439	98	100	84	81
Royal United Hospital	26	92	73	87	90
Royal Brompton Hospital	9	44	89	71	64
The Great Western Hospital	98	86	93	87	92
Princess Royal Hospital	72	100	100	99	99
Queen Elizabeth Hospital	48	0	0	73	71
Scotland					
Western Infirmary	24	0	0	90	90

- The database includes an export facility to import data from other systems. Work is also underway to develop an interface with the Athena database currently being used by British Heart Foundation heart failure specialist nurses.
- The database now provides instant feedback reports so that each hospital can monitor progress by comparing local data completeness with the national average.
- The database is clinically useful and includes a facility for using data to populate clinical discharge letters and summaries.
- In addition to supporting clinical audit the National Heart Failure Audit can also support audit of record keeping and monitor the standards of records produced. Record keeping is an integral part of professional practice, designed to inform and support all aspects of the care process^{xi}. All clinical practitioners are required to keep clear, accurate, legible and contemporaneous patient records which report the relevant clinical findings, the decisions made, the information given to patients and any drugs or other care/treatment prescribed, together with the patient's response to treatment. Within the database, each of the clinical investigations and interventions fields provide both

'no' and 'unknown' options. Over time the audit will be able to measure improvement in the level of information recorded.

5.0 Conclusion

The first phase of the National Heart Failure Audit is a two-year project. At the halfway point, the pilot phase has been undertaken and has provided valuable information about the design of the Heart Failure Audit. A number of changes to enhance the quality of data collection have been recommended and undertaken.

It is hoped that improved participation and data completeness will enable units to assess whether they meet the requirements of the NSF and NICE guidelines and safely compare themselves nationally against other hospitals. The audit provides a specific contribution to other national initiatives including the Standards for Better Health and the Annual Health Check. It will also help organisations meet the Public Service Agreement target. The audit will also support Primary Care Trusts in commissioning the most clinically and cost effective care for patients.

It is hoped that greater national awareness of the audit amongst patients, health professionals and trust chief executives and the acknowledgements of its value will increase participation and data submission. The public have a right to expect open reporting and this will help patients to make informed decisions about their own care and treatment.

Recommendations for the future are for:

- patients to ask if their hospital participates in the national audit
- all hospitals to participate in the audit
- cardiac networks to encourage trusts to submit data to the audit and to use this data for local audit
- Primary Care Trusts and commissioners to use evidence of participation in the national audit as part of the process of commissioning clinical and cost effective services.
- The IC to use the findings and recommendations of the pilot phase of the heart failure audit and the Healthcare Commission service review to inform the development of the next phase of the heart failure audit.

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 The Information Centre for health and social care
1 Trevelyan Square
Boar Lane
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LS1 6AE