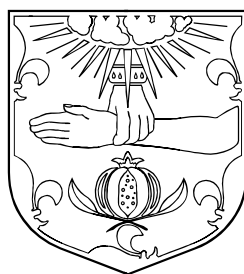


Myocardial Infarction National Audit Project (MINAP)

TRIAL STUDY REPORT

May – September 2000



Myocardial Infarction National Audit Project Team
(July 2001)

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York District Hospital (York Health Services NHS Trust)

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1. Executive summary

1. The Myocardial Infarction National Audit Project (MINAP), provides a mechanism that allows clinicians to examine the management of myocardial infarction within their hospitals in order to meet standards 5, 6 and 7 as specified by the National Service Framework for Coronary Heart Disease [1].

2. A trial study was carried out involving nine sites using the acute myocardial infarction core data set (CDS) [2]. Various forms of feed back from the sites were documented and analysed and the progress of the sites was monitored centrally. Issues highlighted from this analysis were documented and appropriate adjustments were made to both the core data set and literature informing the first wave pilot sites.

3. A workshop of trial sites was held on 14 September to discuss issues identified from the study and to enable sites to document their own experiences and make recommendations.

4. A feedback mechanism was established to report problems, questions and issues. This was then categorised to allow quick and simple analyses and help to provide standardised responses. The major internal processes underscored by the study were the need to involve key staff in the planning and implementation of the audit. These should include the cardiologist, Coronary Care Unit (CCU) nurse, IT department, audit department, pharmacy, A&E and ambulance.

5. The trial study also resulted in the addition of one extra field to the core data set (Was there justified delay before thrombolytic treatment?) as well as highlighting a number of places where extra options were required. The trial also picked out a number of areas requiring further information and the addition of context sensitive help for the software application.

6. The trial study emphasised the importance of promoting accurate recording of data in the clinical notes. It also recommended that data collection should be conducted prospectively and that secondary prevention data from the core data set can be collected for all acute myocardial infarctions as a cyclical audit of three months duration to be performed every 15 months.

7. Trial study recommendations have been incorporated into the relevant information and Welcome Pack literature provided for the project.

2. Background

The Myocardial Infarction National Audit Project (MINAP) aims to establish and implement a core data set to carry out a nationwide audit of acute myocardial infarction. The project is the response of the profession to the audit requirements of the National Service Framework for Coronary Heart Disease. This project began in late 1998 when the Clinical Effectiveness and Evaluation Unit (CEEU) of the Royal College of Physicians of London, in collaboration with the British Cardiac Society, drew together a multidisciplinary Working Group. The Working Group established a core data set for acute myocardial infarction [2] with definitions for terms that would allow the collection of comparable data across the country and provide the basis to monitor the standards for care of acute myocardial infarction (AMI) established by the National Service Framework for Coronary Heart Disease (NSF – CHD):

Standard 5:

People with symptoms of a possible heart attack should receive help from an individual equipped with and appropriately trained in the use of a defibrillator within eight minutes of calling for help, to maximise the benefits of resuscitation should it be necessary.

Standard 6:

People thought to be suffering from a heart attack should be assessed professionally and, if indicated, receive aspirin. Thrombolysis should be given within 60 minutes of calling for professional help.

Standard 7:

NHS Trusts should put in place agreed protocols/systems of care so that people admitted to hospital with proven heart attack are appropriately assessed and offered treatments of proven clinical cost effectiveness to reduce their risk of disability and death.

The core data set was established under the following categories:

- Demography
- Delays to treatment
- Cardiac arrest and resuscitation
- Thrombolytic and anti-thrombotic therapy
- Hospital course
- Secondary prevention initiated in hospital
- Investigations performed or recommended

The following principles were used to develop the data set:

- Data items should be relevant and must be known to be of valid clinical significance;
- Data items should be clearly and unambiguously defined and should be collected to standard definitions to ensure comparability between collaborating hospitals;
- Data definitions should be simple for straightforward data entry;
- Data should be collected as close to the patient and the time of treatment as possible;
- Data should be collected only once during a clinical episode.

The project is built upon a close collaboration with the Central Cardiac Audit Database (CCAD) group, which will maintain the database and ensure rigorous safeguards to allow secure data transmission. CCAD is registered with the Data Protection Registrar and has maintained a database that has been handling NHS cardiac data for several years. Data security measures include encryption of all data and double-encryption of patient identifiers (using a locally generated 56 bit public-private key).

The project will audit the care of patients with acute myocardial infarction in two parts:

- A continuous audit of delays to treatment of patients eligible for reperfusion treatment (about 55% of all infarctions admitted to hospital);
- A cyclical audit of provision of secondary prevention measures for all patients admitted to hospital with acute myocardial infarction.

3. Aim of the study

A trial study was to be carried out with five to ten sites using the acute myocardial infarction core data set. The aim was to identify and measure aspects of data quality (content validity, feasibility, accuracy and reliability). The trial study sought to identify key issues requiring further development leading up to the first phase national implementation of the data set.

4. Methodology

The study proposal established a time frame of approximately 5 months (May – September) for the study. Data collection was to continue after this time as the trial sites were incorporated in to the first wave of implementation.

The selection criteria for the trial sites was that they had a dedicated CCU and had the IT systems in place to carry out the audit. The trial sites were selected as those who had been in contact with the CEEU expressing interest in the planned audit or had been suggested by members of the MINAP Working Group as potential sites. Due to the resources available many of the sites were limited to those in geographical proximity to London. Trial sites had to be extremely enthusiastic and willing to dedicate time working closely with the CEEU to ensure the success of the study.

Each site was given the option of collecting hospital wide or only Coronary Care Unit (CCU) patient data. In both cases the trial sites were asked to collect data on secondary prevention and tests and interventions continuously so that the feasibility of collection could be tested.

4.1 The main phases of the study

1. Initial contact made by project team with lead hospital cardiologist
2. CCAD group made initial contact with hospital IT department
3. Initial site visit and meeting between hospital staff and project team
4. Hospital to set up required internal infrastructure (eg data collection and IT requirements)
5. Start data collection and transmission
6. Monitoring progress /feed back
7. Workshop of all pilot sites to discuss project results

4.2 Trial data collection methods

Site visits and meetings: The aim of the initial site visit/meeting was to bring together key persons involved in the local core data set collection and implementation to:

- a) inform and explain the background to the project
- b) explain what is involved in participating as a trial site
- c) explain and demonstrate the CCAD data collection and transfer system
- d) set in place feed back mechanisms, including audit diaries and telephone hot

- line/fax and e-mail
e) encourage discussion/questions

Discussions mainly focused on what data sites felt was feasible to collect, how they could collect them, what infrastructure was required to do so, who would be involved in this process and at what level. Thorough notes were taken by the project team of these discussions and the questions asked.

Audit diaries: The use of diaries by all those involved in data collection was encouraged. The importance of documenting ALL their experiences was emphasised. The diary included text describing the purpose of the diary, how the information would be used and listing prompt questions as shown below:

- Were the data available?
- Did you experience any problems obtaining these data?
- What was the burden of collecting these data (time and effort)?
- Do you feel confident in the accuracy of the data you have collected?
- Have you found the definitions clear and easy to understand?
- Have you used the online help? If so please document any difficulties.

Diary entries were categorised and entered onto the central database for analysis.

Feed back mechanisms: Telephone hot line/e-mails/faxes/reports. The telephone hot line and fax numbers were clearly stated in the information packs and diaries, all participants were encouraged to use these. Queries were answered and all communications were entered on to a central database for analysis.

Central monitoring: Central monitoring consisted of periodic semi structured telephone interviews to document progress and to ensure continuous communication between CEEU and trial sites. All communications of this kind were recorded centrally.

Workshop: The trial study workshop, held on 14 September at the Royal College of Physicians of London, aimed to discuss issues identified from the feedback and to provide an opportunity, for the trial sites, to present experiences and recommendations. The main contacts and lead cardiologists were asked to attend and to nominate representatives involved in clinical, technical and operational aspects of the audit. One representative from each site was asked to present on the data collection process adopted at their hospital.

5. Results, summary and recommendations

As shown in Figure 1, five hospitals had an initial site visit and three had an initial in house meeting . Eight of the nine hospitals started data collection within the study time frame. The average time taken for the set up of internal infrastructure and data collection procedures to allow for data collection to commence was just over four weeks (n=8). Five of the hospitals transmitted data by e-mail with in the time frame, while none achieved the CCAD gateway connection and data transmission. Factors that may have influenced the speed and success of implementation will be commented on, where appropriate, later in this report. It is important to note that the progression made after this time frame has not been commented on. Column order represents the order the sites were involved in the project (read from bottom to top).

Figure 1: Graph to show time frames of stages of implementation of the audit in each site.

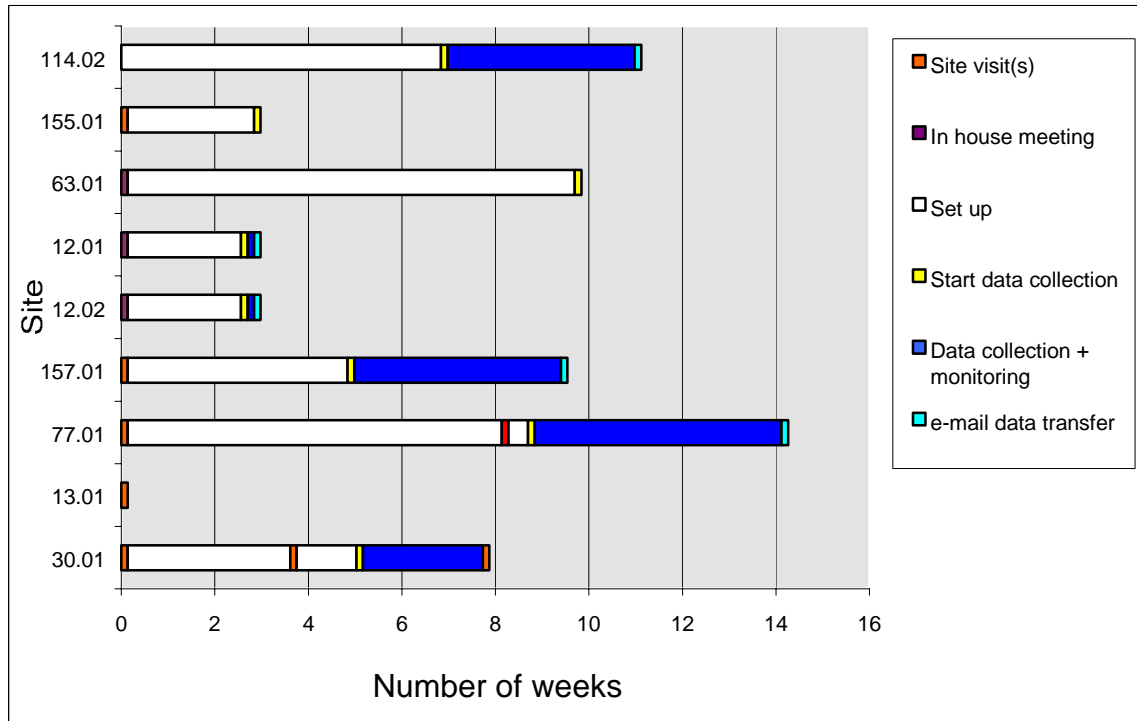


Figure 2 summarises the basic data collection arrangements in each site. The column showing the main contact job title demonstrates the variety of main contact job areas between sites. Data on all hospital wide patients were collected in four sites and CCU patients only in four. All sites collected secondary prevention data continuously. The CCAD software was used in six of the sites, with one site developing their own integrated software and one using a commercial software package. Three of the sites proposed data validation checks they planned to employ.

Table 1: Table summarising basic arrangements in each site.

HOSP	Main contact job title	Software type	MI's collecting	Secondary prevention data	Proposed validation checks
114.02	Senior Chief Cardiac Clinical Scientific Officer	CCAD	CCU Only	Continuous	Not confirmed
155.01	Senior Staff Nurse CCU	CCAD	CCU Only	Continuous	Not confirmed
63.01	Manager Cardiology Research Department	OWN	Hospital wide	Continuous	Not confirmed
157.01	Consultant Cardiologist	CCAD	Hospital wide	Continuous	Validation of 40% of records
12.02	Clinical Effectiveness Manager	CCAD	Hospital wide	Continuous	Validation of 20% of records
12.01	Clinical Effectiveness Manager	CCAD	Hospital wide	Continuous	Validation of 20% of records
77.01	CCU Sister	CCAD	CCU Only	Continuous	Not confirmed
13.01	Manager – Cardiology				
30.01	Professor of Cardiovascular medicine	PATS	CCU Only	Continuous	Not confirmed

The results of the trial study are identified according to the following categories:

- Feedback mechanisms
- Internal processes
- Contents of the core data set (CDS)
- Availability and accuracy
- Consumption of resources
- CDS definitions
- Patient inclusion
- What data to collect under different circumstances
- Other issues (data transmission, data validation)

Each of the categories is presented by: a) description of the issue, how it was identified and its importance; b) the results obtained from the quantitative or qualitative evaluation and c) actions and/or recommendations taken to address and solve the issue.

5.1 Trial site data and feed back mechanism

Issue: The evaluation in this trial study involved a number of different types of feedback from trial sites. The mechanism to deal with feed back was developed and refined as the study progressed. Where possible issues were logged separately, categorised and linked with the appropriate core data set field on an Access database devised by the project team.

The study sought to classify the types of issues encountered according to the following categories:

- Recurring (appeared regularly among all or most hospitals)
- Localised (appeared regularly specifically in one hospital)
- Sentinel (appeared only once)

The overall collection of feedback data was thus a mix of largely qualitative data with a few quantitative summaries. As such it is difficult to summarise the whole package. Feedback in the form of questions or comments arising from the diaries, telephone, fax and emails were relatively easy to log and to repeat in their original form. These have been replicated, where appropriate, in various appendices. For ease of reading they have been grouped according to the general issue being raised. Information in the form of discussion that arises from site visits/meetings and the workshop are less easy to summarise. Selected quotes and summary statements are made as appropriate within the text.

Action:

- This method of logging comments has been adopted for the first wave pilot sites by means of a help desk to answer queries and provide a feed back mechanism to inform any future developments. See Appendix 2.

5.2 Internal Processes

Implementation Process: Methods and issues involved in the implementing of the audit, from initial contact to the collection/transmission of data, were closely monitored throughout this study. These varied between hospitals but there were certain fundamental features that seemed to relate to the successful implementation of the project. These can be seen summarised, along with the required steps and centralised monitoring, in a flowchart. See Appendix 3.

Action: The Stages of the Implementation Process flow chart was included in the Welcome Pack to inform the first wave pilot sites

Data collection process: Differing processes of collecting and inputting of data were developed involving departments in different ways, these processes were subject to internal arrangements such as what data was being collected, IT systems in place, geography, resource availability and management. The following observations were noted:

- data collection and inputting processes were primarily either nurse or audit led.
- rehabilitation nurses and the pharmacy department provided useful support in the collection of data on secondary prevention, tests and investigations.
- for the capture of hospital-wide patient data the audit department were heavily involved, in some cases using triangulation systems to ensure all patients are

picked up ie, biochemistry, clinical coding.

Action: Recommendations/comments relating to the data collection observations, mentioned above, were included in the Application Notes manual of the Welcome Pack to inform first wave pilot sites.

Internal processes summary points:

Two main factors are fundamental to the overall success of the audit:

- Teamwork and involvement of key staff from the outset to allow feasible data collection systems to be developed and the successful implementation of the audit. The key members were: the cardiology team (Cardiologist(s), CCU nurse(s), Rehab nurse(s), Cardiac Liaison Nurse(s)), IT, A&E , Audit, and Pharmacy departments along with the Ambulance Service.
- A dedicated, enthusiastic, main contact, with good understanding of all project phases, who knows what is required from participating departments, is capable of maintaining internal monitoring reviews and communicating regularly with the project team.

5.3 Content of CDS

Issue:

There were 37 comments arising from the diaries, telephone, fax and email regarding the contents of the core data set. These comments were received from six of the participating sites and are shown in Appendix 4. Similar and other comments arose within meetings and from ad-hoc reports. Selective comments are quoted where appropriate. The majority of comments regarding the contents of the CDS concerned the addition of options or fields to the core data set to:

- a) Monitor more thoroughly the internal process ie, “Shouldn’t the time of the first ECG be included?”
- b) Include options that are not covered ie, “no option for cardiac ward/step down unit” and regarding the question did the patient receive aspirin during admission “what if patient is on warfarin?”

From comments during meetings and discussions it was evident that a third reason for the suggested additions to the core data set was to:

- c) collect further information which ensures that the current data once analysed will not provide misleading judgments about the management of patients.

Action:

These comments were carefully considered and influenced the following changes made to the core data set:

- Whom did the patient first call for help (CDS_202): options added “called local help line” and “called GP, told to make own way to hospital”
- Admission ward (CDS_501): extra options added “cardiac ward” and “stepdown unit”
- Tests performed (CDS 701-704): extra option added for “planned after discharge”
- Did the patient receive aspirin during admission (CDS_407): added options for on other anti – platelet/warfarin
- Was there justified delay before thrombolytic treatment? (CDS_409): This whole field was added
- Secondary prevention drugs (CDS_601 – 604): an option for “contraindicated” was added

5.4 Availability, accuracy and completeness of data

Issues:

Comments relating to data availability, accuracy and completeness of data fields as summarised below.

Demography fields: Sites questioned the availability and accuracy of NHS numbers. Comments were also received relating to missing ethnic group and post code, which should be collected routinely as PAS data. Examples of these comments can be seen in Appendix 5.

Delays to treatment fields: Onset of symptoms had been reported as “difficult to obtain” and “not always documented” therefore “have to ask patient, relying on memory, hence may not be accurate.” Time contacted GP and arrival of GP has been reported as “missing” and “difficult to obtain.” Difficulties were reported with the collection of the ambulance times relating to the availability and completeness of ambulance incident forms. Examples of these comments can be seen also in Appendix 5.

Secondary prevention/tests and interventions fields: There were reports of missing/incomplete data in the clinical notes. Examples can be seen in Appendix 5 and in Appendix 6 when directly linked with consumption of resources (see section 5.5 also).

Actions:

- Recommendation to inform local ambulance association of the audit and work together sharing audit information.
- A link added between the National Strategic Tracing Service (NSTS) web site and the MINAP web site so that hospitals can easily trace missing patient NHS Numbers
- An algorithm check for the accuracy of the NHS number added to the CCAD software so that unrealistic numbers are flagged
- RCP to undertake discussions with ambulance bodies regarding future collaboration

5.5 Consumption of resources

Issues:

Comments relating to time burden of collecting data fell in to the following two categories:

- 1) chasing missing data for completeness
- 2) collecting out of CCU data – retrospective data

Refer to Appendix 6 for examples of relevant comments via diary, e-mail and telephone. It was discussed and agreed at the workshop that the burden of continuously collecting secondary prevention and tests and interventions data was too great and hospitals should initially have the option to collect this information on a cyclical basis.

Actions:

The following recommendations have been made:

- to collect secondary prevention, tests and interventions data for all MIs as a cyclical audit for 3 months in every 15 months
- to conduct prospective data collection where possible
- to promote the accurate recording of data in the clinical notes

5.6 CDS definitions

Issues:

There were 22 comments from four sites logged regarding the definition of core data set items these can be seen in Appendix 7.

It was very important to capture the comments regarding definitions and their clarity to ensure all are using the same definition and maintaining data consistency. The audit diary invited comments on this with the question: “Have you found the definitions clear and easy to understand?”

Action:

- From these comments and queries the project team further developed/improved the context sensitive help on the software so that there are clear definitions of each option.
- A statement clarifying the definition of MI in regard to this audit was included in the Welcome Pack.

5.7 Patients inclusion

Issues:

During the workshop it was agreed that in practice all patients admitted with myocardial infarction must be identified. It was advised that data collected on these patients was kept

to minimum data fields for use in mortality tracking. The NHS number must be collected for the ONS tracking service.

Action:

- Recommendation that all patients with MI should be logged, collecting minimum data fields for mortality tracking
- To carefully document in the Welcome Pack which patients to log in practice.

5.8 What data to collect under different circumstances?
--

The clinical discussion, and the questions asked by sites, during the workshop highlighted that clarification was needed about what data is to be collected in different circumstance to ensure correctness and consistency of data collection. For example “How do we log in hospital MI’s 24 hours after admission?”

Action:

- A set of clear scenarios demonstrating what data to collect under different circumstances was included in the application notes in the Welcome Pack

5.9 Other issues

5.9.1 Data Transmission

Data transmission stages are shown in Appendix 3: Stages of implementation process (stages 8 and 10)

Data transmission by e-mail

Five of the eight hospitals collecting data transmitted data by e-mail within the trial study time frame. There was an observed time delay between starting data collection and e-mail transmission (the initial stage of data transmission which should be achieved one week after the start of data collection). This is a relatively easy step to test the format of the export file, which is reliant on the e-mail facilities being available and someone having the confidence/knowledge to create the export file to be e-mailed. Appropriate IT support is necessary. The trial study noted that there was a period of complacency following data collection, suggesting that measures were required to encourage sites to move more rapidly to the transmission stage.

Data transmission by CCAD connection

None of the trial sites transferred data via the CCAD connection within the time frame

(this is the next stage after the initial e-mail transmission). It is important to note that to achieve this connection involves further IT support along with the required software. The gateway software was not available to the trial sites until mid-September.

Actions

- Provide CCAD instruction manuals with required software in the Welcome Pack
- Strongly recommend the involvement and support of the IT department from the outset

5.9.2 Data validation

The trial sites were encouraged to consider and plan a method of validating their own data. This was the subject of discussion during the trial site workshop. It was proposed, and agreed, that at least 5% of data entered onto the data application should be audited against the data entry forms, if used, or the patient notes.

Action:

- Recommendation that 5% of data entered onto the data application should be audited against the data entry forms, if used, or the patient notes.
- To consider the possibility of conducting a data quality study in the future.

6. Conclusion

The trial study objective was to identify and measure aspects of data quality and to identify key issues requiring further development leading up to the first phase national implementation of the data set. The study successfully met these objectives whilst demonstrating the feasibility of collecting the core data set .

The following areas were identified; feedback mechanisms, internal processes, contents of the core data set, definitions of the core data set, availability and accuracy of the data, consumption of resources and patient inclusion. For each area the issues were addressed and appropriate actions and recommendations made. These recommendations were incorporated in to relevant literature in the Welcome Pack developed to assist the first wave pilot implementation. In that way the process of undertaking the trial study helped to develop processes to facilitate the national implementation of the national audit project.

7. References

- [1] NHS Executive. *Coronary Heart Disease National Service Framework* March 2000.
- [2] Birkhead J, Norris R, Quinn T, Pearson M. *Acute Myocardial Infarction A Core Data Set for monitoring standards of care*. Royal College of Physicians. London: 1999.

Appendix 1: Table of trial site data

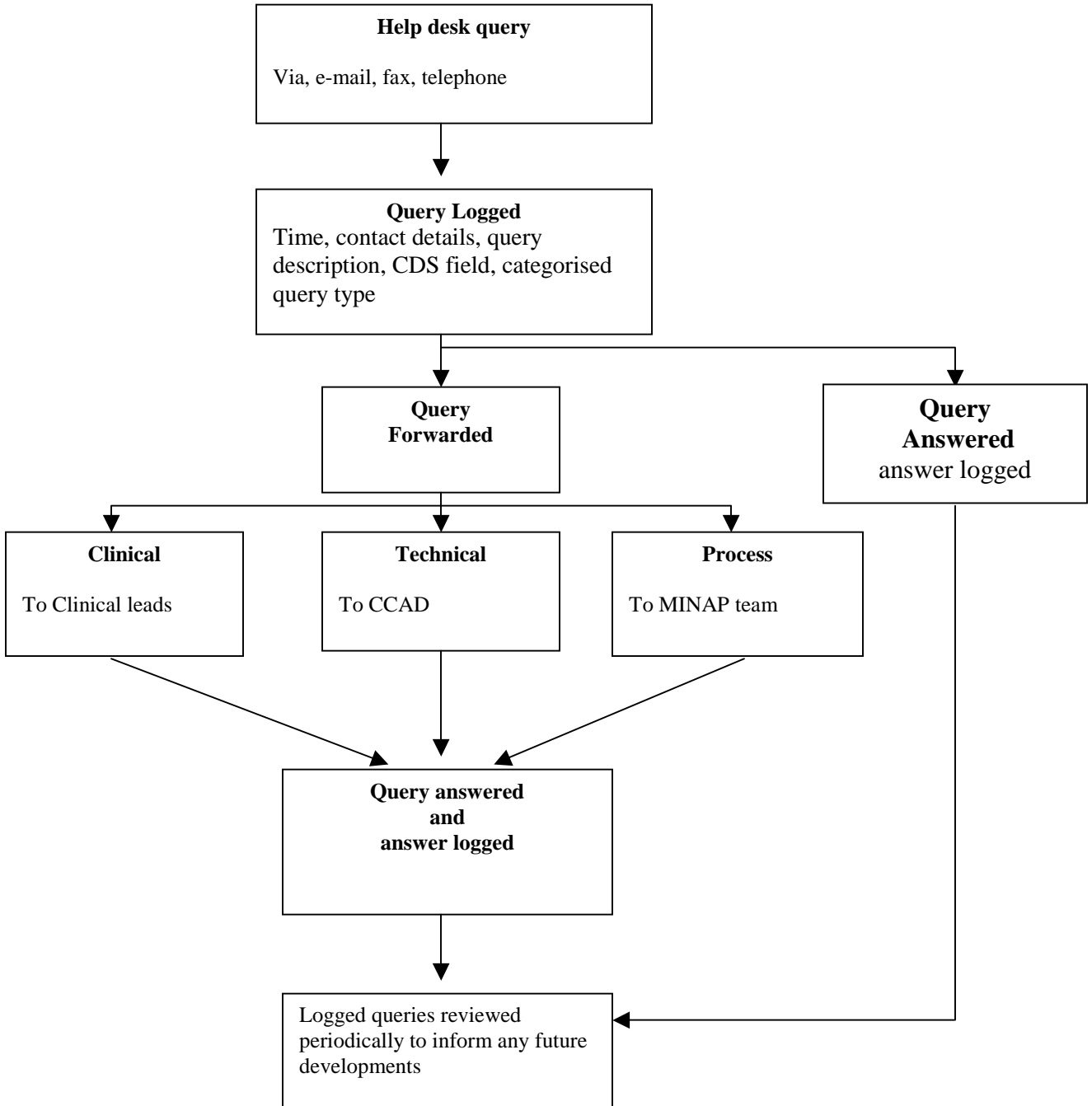
	30.01	13.01	77.01	157.01	12.02	12.01	63.01	155.01	114.02
Initial meeting									
Initial on hospital site meeting	YES	YES	YES	YES	NO	NO	NO	YES	NO
Initial meeting at RCP	NO	NO	NO	NO	YES	YES	YES	NO	NO
N of site staff involved	9	9	6	9	2	1	1	5	0
Representation from the following:									
Cardiologist	YES	YES	YES	YES	NO	NO	NO	YES	NO
CCU nurse	YES	YES	YES	YES	YES	NO	NO	YES	NO
Rehab nurse	YES	YES	NO	YES	NO	NO	NO	NO	NO
IT	YES	YES	YES	YES	NO	NO	NO	YES	NO
A&E	YES	YES	YES	NO	NO	NO	NO	NO	NO
Audit	YES	YES	YES	YES	YES	YES	YES	YES	NO
Pharmacy	YES	YES	YES	YES	NO	NO	NO	YES	NO
Other	YES	YES	NO	NO	NO	NO	NO	NO	NO
Diary: Queries & comments									
CCU staff	11	0	30	5	14	21	0	31	0
Audit	0	0	0	5	15	16	0	0	0
Tel/fax hotline	2	0	3	12	3	1	4	9	1
E-Mails	0	1	2	1	3	6	13	1	0
Progress reports (from any source)	4	2	5	10	6	6	2	10	4
Central monitoring (Telephone interview)									
One week after start date (same questions)	YES	NO	YES	YES	YES	YES	YES	YES	YES
Subsequent (targeted questions based on accumulated experience)	YES	NO	YES	YES	YES	YES	YES	YES	YES
Workshop									
Number attended	1	3	2	4	2	2	2	1	4
Representation from the following:									
Cardiologist	YES	NO	YES	YES	NO	YES	NO	NO	NO
CCU nurse	NO	YES	YES	NO	NO	YES	NO	YES	NO
Rehab nurse	NO	YES	NO	YES	NO	NO	NO	NO	NO
IT	NO	NO	NO	NO	NO	NO	YES	NO	NO
A&E	NO	NO	NO	NO	NO	NO	NO	NO	NO
Audit	NO	NO	NO	YES	YES	NO	NO	NO	YES
Pharmacy	NO	NO	NO	NO	NO	NO	NO	NO	NO
Other	NO	NO	NO	YES	NO	NO	YES	NO	YES
Presentation of data collection method	YES	NO	YES	YES	YES	YES	YES	YES	YES

Please note:

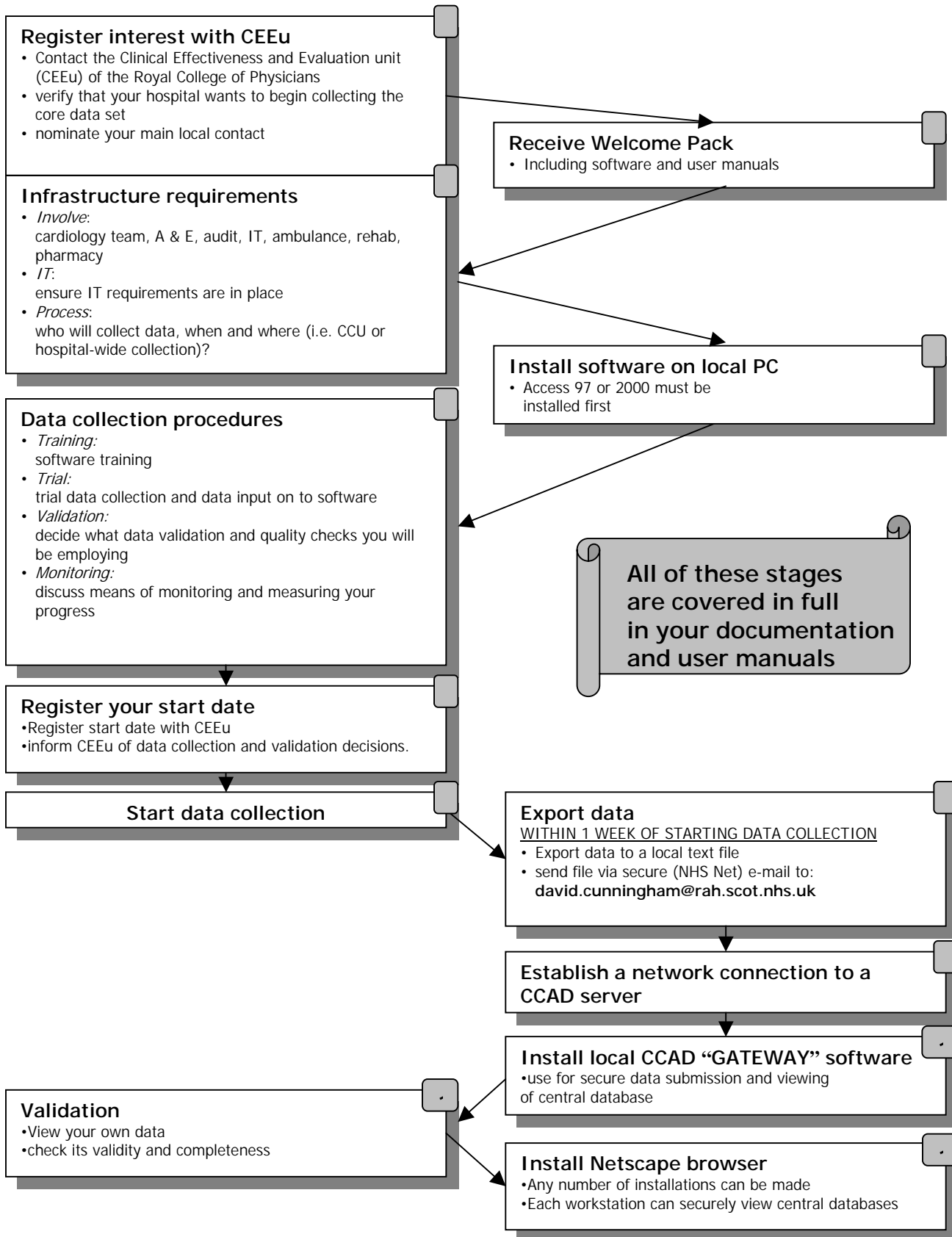
Column order represents the order the sites were involved in the project

* Hospitals 12.01 and 12.02 are part of the same Trust and managed together therefore joint feedback and presentations were received.

Appendix 2: Help desk process



Appendix 3: Stages of Implementation Process flow chart



Appendix 4: Comments on the content of the CDS

conversation type	HOSPN	Item number	Comment
Diary	30.01	.	It may be useful to name the territory of the infarct included for clarity of the information.
Diary	12.01	CDS200	Amendment needed to form: SHO times for: bleeped by CCU and Arrival at CCU
tel	155.01	CDS200	Recording time of arrival at CCU?
Diary	155.01	CDS200	No space allocated on form for justified delay although it is mentioned in the information section over the page on the forms
Diary	155.01	CDS200	On previous thrombosis form more emphasis was put on door to needle time and in house delay were identified though the form and problems discussed with the relevant areas. This form does not include any such data there by delays such as an hour in getting someone to CCU from time of admission are not being identified.
Diary	30.01	CDS202	When did the patient call for help? This hasn't covered all the options, but if you only want to collect these options, can we have an "other" box. We had a patient who phoned the GP and advised him to make his own way to hospital.
Diary	77.01	CDS202	Some confusion over which option is appropriate some times GP called who calls 999 without seeing pt. Also A&E help lines are available.
Diary	155.01	CDS202	Many pts have access to GP blocked by GP receptionist - told to drive to surgery, come to an appointment on a later date.
Diary	155.01	CDS300	Outcome of arrest only one box given but if patient had ROSC and was discharged from hospital which number should it be?
Diary	155.01	CDS401	Need extra number for chest pains relating to fast heart rate or "other"
Diary	155.01	CDS401	Admission diagnosis - nowhere for rate related pain
Diary	155.01	CDS402	I feel it could be possible to have two of the ECG changes mentioned that need treatment but there is no provision for this.
Diary	155.01	CDS402	Could be more user friendly - ie: ECG that doesn't meet criteria
Diary	12.01	CDS402	Amendment needed to form: time of initial ECG for diagnosis
Diary	12.01	CDS403	Amendment needed to form: was reperfusion attempted - Trial suggested if so, which one?
e-mail	63.01	CDS405	Asked about a demarcation with regard to the cardiology team or general medical team making the decision for reperfusion but not for Admitting Consultant.
Diary	77.01	CDS406	Reason treatment not given - ineligible ECG - misleading ? change to ECG non criteria
Diary	77.01	CDS406	Need inconclusive ECG probably op 1
Diary	12.01	CDS408	Current smoker - option: ex smoker
Diary	77.01	CDS500	Death in hospital - options limited
Diary	12.01	CDS500	Data of death/discharge add transfer to other hosp
Diary	155.01	CDS500	There are no indications for inpatient transfers or A&E referrals
Diary	155.01	CDS500	There are no boxes to fill in for pts transferred from B2 or other wards
tel	155.01	CDS501	Site of admission ward given but shouldn't there be a field for the ward where the patient is managed, ie, after acute admission ward ?
tel	157.01	CDS501	No option for cardiac ward/step down unit
Diary	155.01	CDS503	Needs "other" box

conversation type	HOSPN	Item number	Comment
Diary	155.01	CDS503	No box for: Previous thrombolysis, previous cardiac surg/investigations. Treated angina/hypertention - may have untreated
Diary	12.01	CDS506	Amendment needed to form: Serum cholesterol FASTING OR NON FASTING
Diary	12.01	CDS507	Final Diagnosis: added other cardiac diagnosis
tel	77.01	CDS600	The pharmacist expressed concern that the aspirin, beta blocker, secondary prevention section did not provide room for contraindication.
tel	12.01	CDS600	In the case of an elderly patient were secondary prevention is not appropriate the option "no" not discharged on drug will be selected but when the data is analysed is this going to be in an appropriate way?
tel	155.01	CDS600	What about recording reasons secondary prevention measures are not given?
e-mail	155.01	CDS700	Investigations performed or recommended, please confirm that you are only interested in echo. treadmill, angio etc at this admission and not those recommended for future out patient stage as is often the case with angio in our case. It is a little misleading that the title is "performed or recommended". In many cases angio could be classed as yes for recommended but no for performed.
Diary	12.01	CDS700	Add OPD + card f/up OPA
Diary	155.01	CDS701	For some people physical disability prevents them from doing test. But there is no way to reflect this in dataset
tel	155.01	CDS704	What about coronary angiograms planned post discharge?
tel	157.01	CDS705	We need another option respond to another hospital for PTCA or CABG.”

Appendix 5: Comments on availability, accuracy and completeness of the CDS items

conversation type	HOSPN	Item number	Comment
Diary	155.01		In general the information was available
Diary	155.01	CDS101	NHS Number not always available- not known by patient
meeting	12.02	CDS101	How widely is NHS number used and is it obtainable?
Diary	12.01	CDS101	NHS number / Hosp numbers not really available due to case notes not being with patients - once case notes had arrived these problems were eradicated.
tel	157.01	CDS104	Difficulties recording ethnic group. Can we combine 1, 2, 3 black and 4, 5, 6 as South Asian?
tel	157.01	CDS104	A&E have fed back problems with getting ethnic origin data
Diary	77.01	CDS106	Post code ward clerk making sure available
Diary	12.01	CDS106	no post code on demographics
e-mail	12.01	CDS200	Ambulance forms do not contain all the necessary information required.
Diary	12.02	CDS200	Ambulance record sheet not available ? Lost, misplaced
Diary	155.01	CDS200	Problems where mainly in obtaining accurate times in the section: Delays to treatment. If patient had self presented and ECG diagnosed MI other priority questions are asked first and details such as what time help was called may not be gained until later when information may not be accurate
Diary	77.01	CDS200	GP call times very difficult to obtain
Diary	12.01	CDS200	Having difficulty with recoding accurate times i.e. Amb times differ from A&E who diff from wards/CCU
Diary	77.01	CDS201	Times mostly recorded in the CCU admissions book but some times not recorded
Diary	77.01	CDS204	Arrival of GP almost impossible unless pt remembers time
meeting	12.01	CDS207	How do we capture cardiac arrest if it happens in an ambulance?
Diary	77.01	CDS500	Sometimes cholesterols not done routinely (they should be) - have to request cholesterol on admission blood sometimes
tel	157.01	CDS506	Just a note that with elderly patients the serum cholesterol is not taken.
tel	155.01	CDS506	What if serum cholesterol has not been measured?

Appendix 6: Comments regarding consumption of resources (for example comments relating to burden, time and difficulty)

conversation type	HOSPN	Item number	Comment
Diary	30.01	CDS509	Staff are finding it difficult to continue to obtain information once patients leave CCU, ie drug therapy and date of discharge. Rehab team and pharmacy being very helpful but clearly this impacts on the workload of the CCU team. Actually entering data itself is not a problem as it has/ will become part of the admission procedure but feels that this is an issue for discussion. Comment received twice.
Diary	30.01	CDS509	The retrospective data is proving difficult to collect. The discharge data can also take time to establish. If a network is developed, it would be more appropriate for us to put the date the patient was discharged from CCU.
tel	77.01		Comments regarding cardiac arrests: Will be able to collect data on patients who arrest in A&E via the resus team and the CCU arrests we will know. The arrests in other parts of the hospital will be difficult to collect and time consuming ie, post surgery arrests and is also concerned about collecting the out of hospital arrests. Are we collecting if the pt comes in the door with a pulse and not the out of hospitals arrests ie, like in the SHARP study?
tel	77.01		10 complete records (6 in process) Had to change process as the sheets are not getting completed and some times not returned. Also she notes that the medical staff will not enter the data on to collection sheet (even though they are very enthusiastic). Some audit time has been agreed (half day grade 5) not long enough so a lower grade is being used for longer. Feels this is a problem as the audit staff will not understand the terminology on the data collection forms therefore she will have to be trained up and will need to validate the data. This will be time consuming.
Diary	155.01		I feel that the forms do take a lot of nursing time especially as they are new. It would be useful to know what this information will be used for and have regular fed-back as to results found and the implications it will make.
tel	155.01	CDS509	5 pts data but none presently complete. Methodology: Using our data collection sheet which is in the admission packs. The CCU nurse completes as much as can, forms are kept in CCU at all times. Not currently using rehab nurse, audit or pharmacy (as pharmacy nurse who is informed of this project is presently away) and therefore CCU nurses have reported burden of tracking notes and retrieving information from discharge summaries. They have added a number of fields to the database for local use.
tel	155.01		Reporting difficulty in collecting the data, no support from rehab willing but just too much work (busy doing exercise tests, don't see patient till 2 weeks post discharge) As no step down unit pts go to 7 wards (over 400 meters distance) CCU nurse getting discharge summaries to get data. May try using labels on pts notes asking for the discharge summaries to be sent to CCU. Not received any help from pharmacy, pharmacy not computerised. No internal meeting arranged to feed back issues. Recommended that one is arranged to report on how data collection is going.
e-mail	157.01	CDS600	Difficulties accounted by Audit department: *26/7/2000 Database kept freezing , unable to enter information. *Chasing notes very time consuming and stressful. *6/7/2000 Database froze on field 503.

conversation type	HOSPN	Item number	Comment
			*Difficult to get hold of patients' notes once it has left ward. *It's taking one working day to chase 3-4 sets of notes
e-mail	157.01		Difficulties accounted by CCU: 2 nurses working in CCU, sometimes one agency therefore: *Difficulty in completing form (unable to fill forms) *Form taking at least 30 mins to complete due to incomplete medical note, times and dates missing - when tests booked - times drugs commenced or whether tests performed or not. *Drug charts sometimes missing from the notes. *Time consuming, stressful and very difficult to complete due to staff members. *This is encroaching on inpatient management. Statements such as patient to be discharged home on Beta Blockers & ACE with no reference to some on discharge letter.
e-mail	157.01	CDS600	Reasons for incomplete data. 20 incomplete form were recovered from the file in CCU.· Difficulty of getting the clinical notes of cases ·Transfers from CCU needed tracking ·Pressure on CCU staff time to complete eg 30 minutes to complete 1 data form when 2 nurses in CCU ·Information incomplete in clinical notes eg dates times investigations drugs commenced ·Drug charts were missing from clinical nNotes ·Supply of data forms run out ·Nurses (new or Agency) unable to complete form ·Audit advised of incorrect patient location ward
tel	157.01		Called to inform us that a meeting between audit, CCU and rehab/research reviewing their internal pilot has highlighted that there is too much pressure on rehab/research to collect hosp wide MIs (1hr per day following up suspected MIs) and due to holidays they have draw up a contingency plan. Audit will follow up the suspected MI's and pass them on to CCU where the data will be extracted and entered on to data collection sheets. Audit will chase up the patients which have moved from CCU for the discharge data etc. The data collection sheets will be passed from CCU to audit to input. Preparing a presentation to the all ward sisters out lining the NSF and MINAP. He mentions the cost of someone in place to collect this data (ie,. 1 day a week, there are approx 50 cases per week to chase).
Diary	77.01	CDS600	These have not been filled in, in most cases since start. Will be filled in from discharge letter. This will take up time after discharge and will delay the early completion of that patients data.
Diary	77.01		The information missing was collected by myself before data entered. This took 2 hours and still some information could not be collected because patient discharged and some because notes not available without ordering from records (this taking up more time).
Diary	77.01		Sometimes forms are not complete when discharged, in this case ward clerk has been has been retrieving notes from medical secretaries and I have been finishing them off. Not taking too long. Valuable help from ward clerk.
Diary	77.01	CDS700	Not all filled in - will need to do from discharge letter.

Appendix 7: Comments relating to definitions of the CDS items

conversation type	HOSPN	Item number	Comment
Diary	12.02	CDS201	If patient admitted to another specialty and then develops chest pain which onset of symptoms do we record?
e-mail	12.01	CDS205	What constitutes actual ambulance arrival - time ambulance pulls up or time patient enters A&E?
Diary	155.01	CDS300	Pt had a resp. arrest post arrival in acute LVF -do you specifically differentiate cardiac from resp. arrest even when resp. arrest is a result of cardiac problem?
Diary	155.01	CDS303	Outcome of arrest only one box given but if patient had return of spontaneous circulation and was discharged from hospital which number should it be?
Diary	12.02	CDS401	Admission dx initial or admin in to CCU/medical ward
Diary	155.01	CDS402	I feel it could be possible to have two of the ECG changes mentioned that need treatment but there is no provision for this.
Diary	155.01	CDS403	The section; was reperfusion attempted, is slightly confusing if this was completed only for MI patients it would be clearer.
Diary	77.01	CDS406	Need inconclusive ecg probably op 1
Diary	77.01	CDS406	Reason treatment not given - ineligible ECG - misleading ? change to ECG non criteria
Diary	155.01	CDS504	With reference to enzymes are you looking at first bloods on admission or any elevation of enzymes after admission confirming diagnosis in conjunction with ECG changes.
meeting	12.01	CDS505	What is the time frame applicable for diuretic treatment?
Diary	155.01	CDS506	Serum cholesterol - fasting or none?
meeting	12.01	CDS506	What if serum cholesterol measure is carried out without fast?
e-mail	63.01	CDS507	What is the clinical definition for final diagnosis.
meeting	12.01	CDS507	What about units who have moved over to Troponin T?
tel	157.01	CDS507	Please verify that definition for AMI is as appears in software.
e-mail	63.01	CDS507	What is the definition of AMI?
Diary	155.01	CDS507	Threatened MI? what do they mean?
e-mail	12.01	CDS600	The core data set proforma lists "Secondary prevention initiated in hospital", wouldn't it be better as "Secondary prevention prescribed on discharge" as there are patients who are already on drugs prescribed previously.
e-mail	12.01	CDS602	Does a discharge letter from the hospital asking the GP to consider prescribing ACEI or other secondary prevention measure constitute "Secondary prevention initiated in hospital"?
tel	155.01	CDS602	What if patients are in a trial comparing ACE inhibitors?
e-mail	155.01	CDS700	Investigations performed or recommended - please confirm that you are only interested in echo. treadmill, angio etc at this admission and not those recommended for future out patient stage as is often the case with angio in our case. It is a little misleading that the title is "performed or recommended". In many cases angio could be classed as yes for recommended but no for performed.

Appendix 8:

Appendix 1 Core data set with context sensitive help and definitions

Core Data Set (CDS)	Parameter	Options	Definition / context sensitive help
CDS_1.01	NHS number		Unique national identifier. This will be encrypted before data transfer. If not available the computer generated accession number will be used. Any other event or procedure recorded by CCAD will be linked using this number. You should enter this number WITHOUT spaces.
CDS_1.02	Date of birth		
CDS_1.03	Gender	Male Female Not known	Standard classification
CDS_1.04	Ethnic group	White (British) White (Irish) White (other) Mixed white/black Caribbean Mixed white/black African Mixed white/Asian Mixed other Indian Pakistani Bangladeshi Other Asian Black Caribbean Black African Black other Chinese	Standard classification updated to reflect new ethnic codings used in 2001 census and adopted by NHS in 2001.

Core Data Set (CDS)	Parameter	Options	Definition / context sensitive help
		Other ethnic group Not stated	
CDS_1.05	Age		Calculated from date of birth.
CDS_1.06	Full post code		.
CDS_1.07	Accession Number		Number permitting 999999 patient episodes per centre. Computer generated and unique to this episode.
CDS_1.08	Hospital Organisational Code	Predetermined	For identification and analysis of individual centre data. Codes will be supplied centrally.
CDS_1.09	Hospital Number		Hospital number is required for identification if the NHS number is not known. You may enter the hospital case record number or any arbitrary local identifier code, as long as it is unique to this patient.
CDS_1.10	Ambulance job number		Unique number issued by ambulance service, will allow cross referencing with ambulance service database to check dates, times and other data.
CDC_2.01	Time and date of onset of symptoms		The time, to within 10 minutes if possible, when symptoms began. Where there is a prodrome of intermittent pain the time recorded should be the time of onset of those symptoms which led the patient to call for help. Where admission followed an out of hospital cardiac arrest, with no better information available, use the time of the arrest for onset of symptoms.
CDS_2.02	Whom did the patient <i>first</i> call for help?	Called GP, who saw the patient before calling emergency service. Called GP, who called emergency service before seeing patient. Called 999 NHS direct call	In every case the caller refers to the patient or other non professional in attendance. Use also when patient sees GP at surgery, drop in night time clinic etc. In some instances the GP may not actually see the patient.

Core Data Set (CDS)	Parameter	Options	Definition / context sensitive help
		Patient made own way (did not call anybody) Called local helpline Called GP, told to make own way to hospital Patient already in hospital (non CHD diagnosis) Not known	If the patient is already in hospital for a non cardiac admission, enter the time of symptom onset and the time of reperfusion treatment. The date and time of arrival at hospital must be entered but all delay times (except onset-needle) will not be calculated as they are clearly inappropriate.
CDS_2.03	Time and date of call for help		The time of the initial call by patient or attendant. This may be to a GP, NHS Direct, or the ambulance service. This time may be available from the ambulance service record as the time of the emergency call but will only be correct when a 999 call is made to the Ambulance service. Make sure you know to whom the initial call was made. If the call was to a GP (or deputising service), or NHS Direct you will have to establish this time as accurately as possible from the patient. An important time to record wherever possible for standard 6 of the NSF.
CDS_2.04	Time and date of arrival of emergency service		Routine ambulance service data. To be left blank where emergency service not used.
CDS_2.05	Time and date of arrival at hospital		This field MUST be completed - all patients have an admission date. Please use the time recorded by the ambulance service, not the time of the first ECG, nor the time of registration in A&E. Exception: when the patient is self-referred please use the time of registration at A&E. Even if precise times are unknown, you MUST enter the date of admission to hospital - use 00:00 as a default time. Time of arrival in hospital is the time of arrival of the ambulance at the front door.
CDS_2.06	Time and date of reperfusion treatment		The time of onset of reperfusion treatment whether by bolus or infusion. For angioplasty use time of first balloon inflation.
CDS_2.07	Time and date of first cardiac arrest		First verified arrest only to be reported. Excludes syncope or profound bradycardia due to vagal overactivity. Report date and time of death where resuscitation is not attempted.

Core Data Set (CDS)	Parameter	Options	Definition / context sensitive help
CDS_2.08	Delay from onset of symptoms to call for help		
CDS_2.09	Delay from call for help to arrival of emergency services		Component of NSF Standard 5. Allows better understanding of total delay from call for help to treatment. Measured in minutes.
CDS_2.10	Delay from call for help to arrival in hospital		Component part of NSF standard 6. Allows better understanding of total delay from call for help to treatment. Measured in minutes.
CDS_2.11	Delay from arrival in hospital to reperfusion treatment		Component part of NSF standard 6. Allows better understanding of total delay from call for help to treatment. Measured in minutes.
CDS_2.12	Delay from call for help to reperfusion treatment		NSF standard 6.
CDS_2.13	Delay from onset of symptoms to reperfusion treatment		
CDS_2.14	Time and date of arrival of <i>initial</i> professional help		Time of arrival of general practitioner or other first responder.
CDS_3.01	Cardiac arrest	No arrest Before ambulance arrival After ambulance arrival A&E CCU Medical ward Elsewhere in hospital	This field applies only to a first arrest. Multiple arrests cannot be covered by this data set. Provides confirmation that patient did not have an arrest. Implies arrest did not take place in presence of a trained medic/paramedic (specifically called to the scene) and including trained first responders deployed by the ambulance service. Implies arrest in the presence of a medic/paramedic. Refers to OPD, X-ray etc.

Core Data Set (CDS)	Parameter	Options	Definition / context sensitive help
CDS_3.02	Presenting rhythm	Asystole VF/pulseless VT EMD Not known	
CDS_3.03	Outcome of arrest	No return of circulation Return of spontaneous circulation but died in hospital Discharged from hospital (with neurological deficit) Discharged from hospital (no neurological deficit) Resuscitation not attempted Not known	Applies only to outcome of the first arrest but includes arrest in which resuscitation was deemed to be inappropriate. Please enter the fact that resuscitation was not attempted for whatever reason (such as severe co-morbidity). If further arrests occur the outcome will be recorded in the field 'Death in hospital'. Represents failed resuscitation. Represents return of a stable circulation with subsequent death in hospital.
CDS_4.01	Admission diagnosis	Definite myocardial infarction	This is a working diagnosis at the time of admission, whose purpose is to identify those patients who are admitted with a diagnosis of definite MI. Do not change Admission diagnosis on the basis of further ECGs or enzymes/markers. Diagnosis based on unequivocal changes of infarction on admission ECG (ST elevation or new LBBB) and appropriate history and are thus eligible for consideration for reperfusion treatment.

Core Data Set (CDS)	Parameter	Options	Definition / context sensitive help
		<p>Probable myocardial infarction</p> <p>Unstable angina</p> <p>Chest pain ? cause</p> <p>Other initial diagnosis</p> <p>Already in hospital</p>	<p>Should be used where there is strong likelihood of infarction on history and an abnormal ECG without ST elevation or LBBB. It is a working diagnosis needing confirmation by further ECGs and/or rapid enzyme assay. See 'Was there Justified Delay' field for advice on what to enter when first ECGs are not diagnostic, and a subsequent ECG is diagnostic and results in reperfusion treatment being given.</p> <p>Covers all other unstable coronary syndromes apart from AMI. Use when there is release of CK to less than twice upper limit of normal with appropriately timed samples and/or troponin release below your cut off point for AMI.</p> <p>Single episode of cardiac sounding chest pain with admission thought appropriate to exclude ischaemic event. For patients who have no clear admission diagnosis. This covers all other admissions where no clear initial diagnosis has been made, but where there is an index of suspicion that the symptoms may be ischaemic in nature.</p> <p>Other diagnosis should be used for those who were initially given another firm diagnosis such as acute aortic dissection, pancreatitis, etc. and were then subsequently found to have an infarction.</p> <p>In hospital with any condition apart from a manifestation of acute coronary disease. The patient is an inpatient at the time of onset of symptoms. This should not be used to cover a missed diagnosis of infarction.</p>

Core Data Set (CDS)	Parameter	Options	Definition / context sensitive help
CDS_4.02	ECG determining treatment	ST segment elevation Left bundle branch block ST segment depression T wave changes only Other abnormality Normal ECG Not known	The ECG appearances upon which a decision to offer reperfusion treatment including angioplasty, was based. Appearances considered typical of acute myocardial infarction. Any degree of ST segment depression involving more than one lead without any ST elevation (except aVR). Includes non q wave infarction. All other abnormalities thought potentially relevant to this admission eg arrhythmias, conduction disturbances.
CDS_4.03	Was reperfusion attempted?	Thrombolytic drug Primary PTCA Rescue PTCA (in house) Referred for rescue PTCA elsewhere Reperfusion not attempted	Implies one or more doses of any thrombolytic agent. This also includes multiple doses of thrombolytic drug, although only timing of the first dose to be recorded. Rescue PTCA' options imply that thrombolytic treatment was given and was perceived to have failed. Referred for rescue PTCA elsewhere only requires REFERRAL for rescue PTCA, as it is possible that confirmation that this actually took place may not be available at the time of data entry.

Core Data Set (CDS)	Parameter	Options	Definition / context sensitive help
		Not known	
CDS_4.04	Where was initial reperfusion treatment given?	<p>No reperfusion attempted</p> <p>Before admission to hospital</p> <p>In A&E</p> <p>In CCU (direct admission)</p> <p>In CCU (slowtrack)</p> <p>Elsewhere in hospital</p> <p>Not known</p>	<p>Treatment before reaching hospital regardless of who initiated treatment.</p> <p>Regardless of who initiated treatment there.</p> <p>A patient who enters CCU directly from an ambulance without assessment by hospital clinical staff before arrival.</p> <p>Implies admission via A&E or other assessment unit where a diagnosis of definite infarction was made, followed by transfer to CCU where thrombolytic treatment was initiated.</p> <p>Includes acute admission units, general medical wards and catheter laboratories for PTCA.</p>
CDS_4.05	Who took the <i>initial</i> decision to attempt reperfusion?	<p>No reperfusion attempted</p> <p>Specialist nurse</p>	<p>If this was GP or PARAMEDIC you may type this in using capitals.</p> <p>Nurse with appropriate training to initiate thrombolytic treatment according to local protocol.</p>

Core Data Set (CDS)	Parameter	Options	Definition / context sensitive help
		A&E clinician Member of on call medical team Member of on call cardiology team Not known	Clinician employed in A&E; any grade. On call medical team; any grade. On call cardiology team; any grade.
CDS_4.06	Reason thrombolytic treatment not given	Ineligible ECG Too late Risk of haemorrhage Uncontrolled hypertension Administrative failure Elective decision Not known	Note that some of the original contraindications are no longer used, including diabetic retinopathy, liver disease, and warfarin therapy. Sometimes there may be more than one contraindication to treatment. You can only enter one with 'Too late' having priority over all the others. ECG does not show unequivocal ST elevation or LBBB. Represents a decision made in light of a local protocol. It may be checked against other recorded delays where admission diagnosis is definite myocardial infarction. Includes risk of bleeding from all sites and prolonged resuscitation. A decision made in the light of local protocol, an appropriate contraindication especially in older people. To be used where in the opinion of a senior clinician thrombolytic treatment was withheld incorrectly. To be used where a decision was made not to treat a patient (severe coexisting morbidity or dying).

Core Data Set (CDS)	Parameter	Options	Definition / context sensitive help
CDS_4.07	Did the patient receive aspirin during admission?	Already on aspirin	Regular use of aspirin during this episode.
		Aspirin given out of hospital Aspirin given after arrival in hospital Clinical contraindication to aspirin (and no other antiplatelet agent used) Other anti-platelet used No anti-platelet agent used On warfarin, aspirin not given	Aspirin started for this episode before admission. Either already on another antiplatelet agent or started on one because of clinical contraindication to aspirin.

Core Data Set (CDS)	Parameter	Options	Definition / context sensitive help
		Not known	
CDS_4.08	Current smoker	Yes No Not known	A smoker is a patient regularly smoking one or more cigarettes per day, or equivalent and includes someone who has smoked during the last month.
CDS_4.09	Was there <i>justified</i> delay before thrombolytic treatment?	No Sustained hypertension Clinical concern about recent cerebrovascular event or surgery	You should have a local protocol for management of sustained hypertension and the use of thrombolytic treatment after cerebrovascular events. When an initial ECG is not diagnostic of acute infarction (i.e. not eligible for reperfusion treatment), and a subsequent ECG develops 'typical' ST elevation so that reperfusion treatment is given, record this as 'Justified delay' (option: Initial ECG not diagnostic), and use 'Probable Infarction' as the Admission diagnosis. The frequency of use of this field will be subject to close scrutiny. There is no option for delay caused by entering the patient into a clinical trial. Only one choice is available, use the most applicable. As defined by local protocol. As defined by local protocol.

Core Data Set (CDS)	Parameter	Options	Definition / context sensitive help
		Delay obtaining consent Initial ECG not diagnostic Cardiac arrest	<p>Where patient requests delay. Use only when the patient wishes to take time to consider use of a conventional (non trial) thrombolytic drug.</p> <p>When initial ECG not diagnostic of acute infarction (ie not eligible for reperfusion treatment), and a subsequent ECG develops typical ST elevation so that reperfusion treatment is given.</p>
CDS_5.01	Admission ward	Cardiac care unit Acute admissions unit General medical ward	<p>Refers to the unit to which the patient is admitted either from A&E or directly by ambulance service and where patient will spend majority of first 24 hours in hospital. If patient admitted direct to cath lab, enter facility to which patient admitted on leaving lab.</p> <p>A unit specified for this purpose including those with shared facilities with ITU, or HDU, or a dedicated CCU unit which is part of a general medical ward or a dedicated cardiac ward and where the major part of early management takes place.</p> <p>Unit specifically for assessment, evaluation, or admission of emergency medical patients.</p> <p>Where this is separate from a CCU, and is not the usual place for care of early infarction.</p>

Core Data Set (CDS)	Parameter	Options	Definition / context sensitive help
		Intensive therapy unit Other Died in A&E Cardiac ward (non CCU) Stepdown ward	Where this is separate from a CCU, and is not the usual place for care of early infarction. To record patients admitted to non-medical wards or who had infarction while already in hospital.
CDS_5.02	Admitting consultant type	Cardiologist Other general physician Other	The clinician having primary rather than advisory care of the patient immediately (first 24 hours) after admission to hospital (not the A&E consultant). Full time cardiologist or physician with a major interest in cardiology. All other physicians. Patient admitted under another discipline, eg surgeon.
CDS_5.03	Previous medical history	None Previous AMI Previous treated angina Hypertension	Enter each diagnosis as appropriate, whether it is a new diagnosis or previously recognised. Multiple values may be selected.

Core Data Set (CDS)	Parameter	Options	Definition / context sensitive help
		Diabetes Hyperlipidaemia Peripheral vascular disease Asthma Not known	
CDS_5.04	Were cardiac enzymes elevated?	Yes No Not known	Enzyme activity (CK, CK_MB or other cardiac enzyme) greater than twice the upper limit of normal for the hospital laboratory on a single sample. If non cardiac specific enzymes are normally used in your unit, please enter in appropriate field. If enzymes are elevated by more than twice the upper limit of normal then the Final Diagnosis must be 'Definite infarction'. If the patient dies before bloods are taken enter 'Not known'.
CDS_5.05	Diuretic treatment	Yes No Not known	The use of a diuretic implies recognition of clinical manifestations of heart failure. If diuretic therapy is initiated at this admission or the dose is increased, enter 'Yes'.
CDS_5.06	Serum cholesterol		Ideally a fasting sample taken within 24 hours of admission to hospital.

Core Data Set (CDS)	Parameter	Options	Definition / context sensitive help
CDS_5.07	Final diagnosis	<p>Definite myocardial infarction</p> <p>Unstable angina</p> <p>Threatened MI</p> <p>Chest pain of uncertain cause</p> <p>Myocardial infarction (unconfirmed)</p>	<p>The definition, for the purpose of this audit, requires the presence at least one of two features; a history consistent with the diagnosis, and/or cardiographic changes plus biochemical confirmation either by release of a cardiac specific enzyme to greater than twice the upper limit of normal for the local assay, or elevation of troponin T or I to a level accepted locally as representing infarction. If non cardiac specific enzymes are used then a serial rise and fall of these enzymes over the appropriate time period is required, with at least one value greater than twice the upper limit of normal. A single abnormal value of a non cardiac specific enzyme is inadequate to make a diagnosis of infarction.</p> <p>Where there is release of CK to less than twice the upper limit of normal from appropriately timed samples, in the context of a history consistent with cardiac ischaemia, a diagnosis of unstable angina should be made (synonymous, for the present, with acute coronary syndrome). This diagnosis should also be used when there is release of troponin to an amount less than the local cut off point for AMI.</p> <p>After early reperfusion treatment there may be rapid resolution of existing ST elevation associated with a CK rise less than twice the upper limit of normal. This term should be used in this circumstance. If only troponin has been measured and is elevated, it is a local decision whether this is recorded as definite infarction or threatened infarction. In practice analysis of the use of thrombolytic treatment will be based on the admission diagnosis rather than the final diagnosis.</p> <p>Use in any patient admitted with chest pain not accompanied by significant cardiographic change or enzyme / troponin release, and where no other clear diagnosis emerges. It is likely that at admission there was a high index of clinical suspicion that the pain was cardiac, but this remains unconfirmed</p> <p>Exceptions must be made for patients who die before enzyme release can occur or samples taken. Clinical judgment, preferably with additional evidence of a history of chest pain or cardiographic changes, has to be made. If in doubt this diagnosis can be made and analysis will take this into account.</p>

Core Data Set (CDS)	Parameter	Options	Definition / context sensitive help
		Other diagnosis	Use where a patient is admitted with clinical suspicion of cardiac pain, and where any diagnosis other than cardiac ischaemia is confirmed.
CDS_5.08	Death in hospital	No From MI From complication of treatment Other non cardiac related cause	From all causes directly attributable to index event; whether due to VF or cardiogenic shock. Death from haemorrhagic stroke or other bleed as a result of treatment.
CDS_5.09	Date of death or discharge		Routinely collected HES data. Date of discharge should also be used for patients who are transferred elsewhere for coronary angiography or intervention. For patients who are transferred for an agreed day case procedure, the date of discharge is when the patient finally leaves hospital.
CDS_5.10	Peak CK		The biochemical definition of acute infarction and acute coronary syndromes has to take account of proposed changes of biochemical criteria which have not yet gained widespread agreement or acceptance. The dataset has been increased to allow entry of two markers and the locally agreed cut off point. Definitions have to take account of the fact that some Trusts are using troponin with different cut off points for the definition of infarction, as well as the fact that only about 50% hospitals were using troponin in mid 2000. The rest are likely to be using creatine kinase (CK). If you are measuring both please record both peak values.
CDS_5.11	Peak troponin		
CDS_6.01	Beta blocker		Discharged from hospital on oral beta adrenergic blocker treatment.

Core Data Set (CDS)	Parameter	Options	Definition / context sensitive help
		Yes No Contraindicated Not known	
CDS_6.02	Angiotensin converting enzyme inhibitor	Yes No Contraindicated Not known	Discharge from hospital on angiotensin converting enzyme inhibitor.
CDS_6.03	Statin	Yes No Contraindicated Not known	Discharge from hospital on a statin.
CDS_6.04	Aspirin or other anti platelet drug	Yes No Contraindicated Not known	Discharge from hospital taking aspirin or any other antiplatelet agent.
CDS_6.05	Cardiac rehabilitation	Yes No Not known	Referral to a rehabilitation service either in hospital or after discharge.
CDS_7.01	Exercise test	Yes No	Performance of an exercise test during this admission.

Core Data Set (CDS)	Parameter	Options	Definition / context sensitive help
		Planned after discharge Not known	Only use this option when firm arrangements are in place before discharge.
CDS_7.02	Echocardiography	Yes No Planned after discharge Not known	Performance of an echocardiograph during this admission. Only use this option when firm arrangements are in place before discharge.
CDS_7.03	Perfusion or other cardiac radionuclide study	Yes No Planned after discharge Not known	Performed at this admission. Only use this option when firm arrangements are in place before discharge.
CDS_7.04	Coronary angiography at this admission	Protocol driven investigation performed in this hospital Symptom driven investigation performed in this hospital Protocol driven investigation performed at another centre Symptom driven investigation performed at another centre Not performed Planned after discharge	Where clinician considers angiography necessary for management in the absence of continuing clinical symptoms. Angiography performed for continuing symptoms. Only use this option when firm arrangements are in place before discharge.

Core Data Set (CDS)	Parameter	Options	Definition / context sensitive help
CDS_7.05	Coronary intervention at this admission	PTCA /stenting CABG Not performed Planned after discharge	Procedure for recurrent symptoms or as an elective procedure. Use CDS_4.03 for primary PTCA and rescue PTCA. Only use this option when firm arrangements are in place before discharge.