

DATA COLLECTION FOR THE

MYOCARDIAL ISCHAEMIA
NATIONAL AUDIT
PROJECT

APPLICATION NOTES

Version 7
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**National Institute for Cardiovascular Outcomes
Research**

Data Collection for the Myocardial Ischaemia National Audit Project

Introduction

The Myocardial Ischaemia National Audit Project (MINAP) is now in its eleventh year. In that time it has developed from a project covering the audit requirements of the National Service Framework (NSF), into a tool with which it is possible to audit all aspects of inpatient care for acute coronary syndromes. All hospitals in England and Wales continue to enter records. There are now more than 850,000 records collected over 10 years providing very powerful tool with which to monitor trends in care over time.

The dataset has grown from just over 50 items in 2000 to 122 in the present version. The dataset has grown in order to cover all aspects of care of patients having acute coronary syndromes (ACS). Every field that is added is considered carefully for value and applicability. It does not follow that all fields in the dataset are to be used for every record. This revision (January 2011) adds fields, (and removes some) and makes additions to options in existing fields in response to the rapidly changing management of acute coronary disease. When a field is removed the data contained within it are archived. We expect the number of fields to stabilise out around the present number.

The central purpose of the dataset, and of MINAP, is unchanged. It is to allow hospitals to record and analyse, in consistent fashion, the care that they provide for patients with all ACS. The data are, however, used by others with a legitimate interest. We would draw your attention to the fact that the Care Quality Commission (CQC) can request data from MINAP when they have to make specific enquiries into performance by an organisation. It pays to have first class data!

The new fields, and those removed are listed in Section 1. Every two years MINAP reviews the dataset in order to keep up with the rapidly changing world of cardiology. This revision has special significance as it marks the first step towards merger of the MINAP and British Cardiovascular Interventional Society (BCIS) datasets. The great majority of patients with troponin positive ACS now have a percutaneous coronary intervention during the admission. MINAP attempts to record as much of this activity as possible, but there are areas where this is difficult. In particular it is difficult to keep track of patients with nSTEMI who are transferred elsewhere for angiography and intervention, as they are not entered into MINAP at the interventional centre.

BCIS maintains a database of all coronary interventional work performed within the UK, including primary angioplasty for STEMI, and more delayed intervention for nSTEMI. While BCIS records what goes on in the catheter laboratory, there are about 28 fields that are identical between MINAP and BCIS and a further 10 or so that are fairly closely aligned, but in need of revision in order to be completely congruent. With almost 40 fields either identical, or nearly so, a joint dataset is a logical step. This will assist linkage of patients cared for by two hospitals, and it will reduce time consuming and wasteful double data collection. This will not happen overnight, but the process of alignment of overlapping fields has already begun. We have also modified the fields that are similar, but which lack complete agreement. There have been changes to both datasets in order to do this. With some fields it has been possible to make modifications that allow consistency with previously collected data. In a small number it has been necessary to archive the original field and introduce a new one.

MINAP continues strongly to encourage recording and analysis of patients having non ST elevation ACS; we make no apology that the completeness view and validation tool are largely based on data available for care of non ST elevation ACS. MINAP has enjoyed enormous support from colleagues in hospitals throughout England and Wales – many of whom we have come to know in person. Without you the project would have failed. We are very grateful for your continuing efforts and support.

Contacting MINAP

The MINAP team provides a Help Desk during working hours for problems related to either the application or the clinical definitions and related issues involved in the audit. We would very much prefer it if you contacted the help desk by e-mail, but if this is not possible you can also reach us by telephone. Where possible we will endeavour to get back to you within 24 hours of your query.

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1 The new dataset version 9.1

This version of the dataset (v 9.1) adds 2 new fields, modifies 3 fields and removes 1 field. These changes are part of the planned merger of the MINAP and BCIS datasets. There are modifications in the options or definitions to other fields, either at the request of users, or to adjust to new circumstances. The changes and additions are listed below and described in detail in the appropriate section.

1.1 New fields

2.40 Patient location at time of STEMI

2.41 Killip class

1.2 Fields archived and replaced with a new field

1.12 Patient ethnic group archived and replaced by 1.13 Patient ethnicity

2.02 Method of admission archived and replaced with 2.39 Admission method

1.3 Fields removed

4.22 Patient case record number at referring hospital

The new dataset (MINAP v9.1) with additional definitions and context sensitive help is in Appendix 3. It is also available together with a data collection form and a list of the new fields and options on the MINAP pages for the NICOR website at www.ucl.ac.uk/nicor/audits/minap.

1.3 The data application

In order to accommodate the new fields and options the MINAP data application has been modified. The updated MINAP application will be available to you automatically on the CCAD servers. Those using commercial applications or locally developed applications must ensure that their new applications contain all the modifications that have been made. Check with your provider if in doubt. If you are using locally developed software you will need to update the options dictionary held locally.

1.4 Use of MINAP data

MINAP data are used by increasing numbers of groups outside of your hospital who have a legitimate interest in the analyses. These now include

- Cardiac networks and Commissioners
- Ambulance service trusts who access data on their patients via the ambulance outcome database.
- Strategic Health Authorities. Quarterly aggregate analyses
- The Department of Health and Welsh Assembly Government. Quarterly aggregate analyses
- The Care Quality Commission (CQC) will use MINAP data for their Quality and Risk Profiles and may also request analyses of MINAP data on an *ad hoc* basis where concerns have been raised about hospital performance
- The Public Report, which is read widely by organisations as well as the general public
- Department of Health Indicators for Quality Improvement
- NHS Choices website

It is important that these groups are given an accurate impression of your hospitals' performance. Data entry must be timely and complete in order to provide high quality analyses.

1.5 Patient identification

There are strict rules for the use of potential patient identifiers. Although you enter patient identifiers into the MINAP record, these are not available unencrypted outside your own hospital. The following sums up the present position, and should allay any Trust concerns about access to patient identifiable data outside of your Trust.

- Forename and surname are imported to CCAD but remain pseudonymised on the servers.
- Date of birth is converted to age on admission.
- Hospital number (Patient case record number) is pseudonymised by CCAD so that it can still be used as a unique identifier within a hospital, but cannot be used to identify the individual.
- NHS number is pseudonymised by CCAD so that it can still be used as a unique national identifier, but cannot be used to identify the individual.

- Hospital identifier is pseudonymised when released for research purposes.
- Post code of residence can be an identifier where small numbers of individuals share a post code in rural areas. It is used to derive other post code dependant variables such as Index of Multiple Deprivation score (England only). Post code of residence is not available once derived fields have been created by CCAD.

2 Central audit requirements for AMI

We have agreed to supply the CQC with MINAP data for their Quality Risk Profiles. This will be provided quarterly, three months in arrears for the following:

- Participation in MINAP (defined as data completeness in each of the 20 data completeness fields of >90% and an agreement score of >80% in the data validation study based on >15 records)
- Call to needle within 60 mins for acute and ambulance trusts
- Call to balloon within 150 mins and Door to balloon within 90 mins. This will be based on BCIS data using MINAP data for ambulance trust codes and to complete missing times.
- Discharged on secondary prevention medication (aspirin, thienopyridine inhibitors, ACE inhibitor/ARB and beta blocker)
- nSTEMI patients that were referred or had angiography
- Admission of nSTEMI patients to a cardiac ward or unit

We also provide Call to Needle and Call to Balloon data by hospital and secondary prevention data by PCT to the Department of Health for their Vital Signs and Indicators for Quality Improvement.

3 Practical aspects of data collection

3.1 General

The MINAP dataset is a collection of terms and definitions which allow national consistency when comparing or describing any aspect of care of acute coronary syndromes. It does not follow that every data item should be recorded for every patient. Data collection for MINAP should ideally be part of the clinical pathway of care of these patients, rather than a secondary chore performed subsequently. Contemporary data collection is easier and more accurate than notes trawling some time after the event. Some hospitals have care pathways, and others use the data proforma we provide which makes data gathering before data entry very much easier.

MINAP should be thought of as a clinical support tool which allows you to examine all aspects of care of your patients with ACS. Local analysis of data using the Excel download is used by many hospitals to examine other aspects of care. See Section 3.10.4. There is considerable variation in the amount of local support given to data collection. Those with the most support are able to make the best use of the potential of MINAP.

3.2 Keeping MINAP up to date

In order to provide you with contemporary analyses we need up to date patient records. About 50% MINAP records are entered within 4 weeks of admission and about 85% within three months. MINAP analyses are made available to SHAs, and the Department of Health one month after the end of each quarter and they are updated monthly after that. Analyses for ambulance trusts are now updated weekly. Misleading impressions of hospital performance are inevitable unless data entry is as close to contemporary as possible. Editing or completion of records can still take place after the record has been sent to the servers, and this is preferable to waiting until all records are complete before download

3.3 Locking the database; time constraints on adding new records and editing

In future the database will be locked for the previous calendar year on 1 July. This means that no records with an admission date for the previous year can be added or edited after that date. The reason for this is primarily because, from necessity, MINAP is changing the way that it aggregates and analyses the very large number of records (>860,000) that it now holds. A second reason is that late data entry is associated with less good data quality

3.4 Which patients to record

We encourage you to record all acute coronary syndromes admitted to your hospital. The increasing use of primary PCI means that hospitals no longer admitting ST elevation infarction are in a position to focus on other ACS.

For interventional hospitals the interventional audit fields allow closer examination of process of care for those referred for primary PCI and other coronary interventions. It is as important to record those who do not receive the intended procedure – who will have activated the pathway, with subsequent cost – as well as those who are treated. Patients having primary PCI who may only be within the interventional centre for a few hours must be recorded. We suggest this is limited to fields listed for Rapid repatriation patients in Section 18.1.1, based on practice at Leeds General Infirmary.

3.5 Which patients not to record

While it is inevitable that some patients who are logged will turn out not to have an episode of acute coronary ischaemia, (overall figure ~ 5%), in some hospitals the figure is far higher, and this would not seem to be a good use of valuable resources.

3.6 Mandatory data items for STEMI and other ACS

The MINAP data set is a collection of terms and definitions which allows national consistency when comparing or describing care of acute coronary syndromes. It does not follow that every data item should be recorded for every patient. Some hospitals have described the limitations due to lack of support for data entry and we have been asked to designate which are fields are mandatory. The mandatory fields for both STEMI and other ACS are listed in Appendix 2. However the designation of fields as mandatory must not be interpreted as meaning that other fields are not required. Fields designated as Mandatory are those which are essential for existing and likely future national measures of performance, but they do not necessarily give you a complete picture of your hospitals activity.

3.7 Logging patients with ACS not admitted to cardiac wards

MINAP data for 2009 showed that less than 50% of patients with non ST elevation infarction are admitted to a CCU or other cardiac ward. They receive less secondary prevention medication, less coronary angiography and continue to have less involvement from cardiologists. In practice recording patients spread around a hospital is difficult, as it is very resource intensive but we strongly recommend it in the interest of equity of patient care. Overall MINAP probably receives records on about 60% of all admissions to hospital with non ST elevation ACS. Your biochemistry department will be able to provide a list of patients who have an elevated troponin value and this is a useful means of cross checking admissions with ACS. Each hospital should plan a strategy to move towards inclusion of all patients with acute coronary syndromes into MINAP, but this may have to follow the development of local facilities to care for all ACS within the same environment.

3.8 Logging patients to provide case fatality data

Vital status and date of death are available from the National Health Service Central Register (NHSCR). We can provide you with case fatality data only if you have provided a valid NHS number.

3.9 Logging patients with cardiac arrest in A&E

It is important that all arrests occurring to patients with infarction occurring in A&E or surviving an out of hospital arrest are recorded. Not all arrests who fail to survive A&E are recorded in MINAP, sometimes because the diagnosis is uncertain, and sometimes because of difficulties with record keeping. You may need to liaise with your Resuscitation Officer or A&E staff to identify all arrests in MI patients.

3.10 Data quality

MINAP data are now widely used for performance management purposes and it is essential that everyone has confidence in the data. Good data validation is essential to this project and the confidence of all involved in this work ultimately depends upon the integrity of the data collection and entry. The MINAP data application has always had inbuilt range checks to ensure that data outside permitted ranges are not allowed. It also has some new consistency checks to warn when data are entered inconsistently. Please be aware that hospitals are bound under the Data Protection Act 1998 to ensure that the data should meet the necessary standards of completeness, accuracy and relevance.

3.10.1 Data completeness

The analysis is based on records having a Discharge diagnosis of *4. Acute coronary syndrome (troponin positive)*. Data completeness for these key fields is currently 99% nationally. From 2011 the analysis will

be based on a requirement for every field to score $\geq 90\%$ rather than the existing requirement for an average of $\geq 90\%$ across all data items. The data completeness fields are listed in Appendix 1.

3.10.2 Data accuracy: the data validation exercise

Each year we ask you to re-enter the data from the case notes for 20 dataset items for 20 cases of non ST elevation infarction or troponin positive ACS that have been randomly selected by CCAD. Some of these dataset items may change from year to year. Hospitals receive individual reports showing their scores compared to the national average. The annual data validation study has been compulsory since 2004 and forms part of the evidence of participation in MINAP. The current data validation fields are listed in Appendix 2.

3.10.3 Recommendations for maintaining data quality

- You should register MINAP with your Trust data protection officer.
- You should designate one person to have overall responsibility for data collection, with clinical support if needed.
- Backup support must be identified for periods of leave etc. It is the responsibility of your Trust to support you in this.
- You should identify someone in your hospital with overall responsibility for MINAP.
- Current data collection manuals with MINAP definitions should be made available to all staff involved in data collection and entry.
- Data entry should ideally be contemporary.
- You should establish systems to routinely check case inclusion/exclusion.
- MINAP reports should be circulated to relevant clinical and managerial staff and commissioners to encourage shared ownership of the data.
- Issues arising from the annual data validation study should be investigated locally.

3.10.4 Exporting data to Excel

We recommend that you check analyses in your audit reports by downloading your data into Excel using the Export V9 Dataset option under Import/Export. This allows you to choose

- where to save the export
- the date range
- life status which appends life status to the record
- geographical and social deprivation data
- zip files which saves disc space by compressing your files.

4 A guide to using the MINAP data application (MINAP 9)

4.1 Overview of the data application

This section should be read by those who record and input data.

When using the application you will normally use the central servers on which to store the data rather than the hard drive on your PC. Depending on line speed this could be slow. You can, if you have a slow connection, make a local replica of the MINAP database. This is essentially a copy of a server database containing only your records that resides on your local PC. See Section 4.4. However, you must upload your records frequently to CCAD, for if you have a local crash you will have no backup. You are advised to upload at least weekly. Alternatively you can set up an automatic replication schedule to upload your data regularly. Incomplete records can be completed or corrected later on your local copy of the database, and when these are subsequently sent to the servers they will overwrite the originals without duplication.

4.2 Context sensitive help

Additional information is available for almost every field in the Application. Advice on data entry, definitions, etc is available by clicking on the field options and then the Field Help buttons on the text bar above the data entry screen, next to the Save and Close buttons.

4.3 Data entry tips

Moving about and selecting options

Almost all answer spaces are now white boxes. Where there are options a 'drop down' or 'combo' box is provided. This has a ▼ on the right side. Click either over the white space or on the ▼ to open the options. Either click on the option or hit the number of the option, followed by Tab which closes the box and moves you on to the next field. Alternatively use your mouse to get about, using Left click to open fields.

Every option starts with a number

You will soon remember them and this will speed data entry. If you enter the number for an option the rest will be entered for you. Short cuts always carry risks; check that you have selected the right option!

Dates and times

You can enter e.g. 02 07 2002 or even 2 7 2002, (with a space between day and month, month and year) and this will appear as 02/07/2002. For time you must enter the colon : between hh and mm, so 2 7 2 12:34 would become 02/07/2002 12:34, but 2 7 2 12 34 will produce an error message. Please note that for Date of birth you must enter the year in full.

Making a mistake with times

Error checking routines prevent most illogical times from being entered and give you a warning when this happens. Exception; it is possible to have an onset of symptoms after arrival in hospital for those patients who have an infarct in hospital having been admitted with an entirely separate diagnosis and patients receiving pre-hospital thrombolysis who will have a negative Door to Needle time. If a wrong date is entered wipe the whole entry using the mouse and re-enter.

Deleting incorrect entries

The Clear Current Field button allows you to clear the value of the current field but there are some fields that you can only change from one value to another and not set back to blank again.

When information is not available

If you are completing a multiple option field where the answer is unknown never leave the field blank as blank and 'Unknown' do not mean the same thing! Always enter an available option, such as 'Unknown'. All MINAP fields have options for unknown; please use them as appropriate. However, for numeric responses (cholesterol, troponin etc,) *never* enter 0, zero when the answer is not known; here you must leave a blank.

User definable fields

There are 32 free fields that you can use to record locally important data. This will be linked to the rest of the patient record, but will not be analysed by CCAD. The fields will be encrypted for transfer so it is safe to enter patient identifiers should you wish. Instructions on labelling fields are given.

Close and Save Record

On the text bar above the data entry screen are two buttons allowing you to Save the record or Close it. If you use Close this invites you to save the document with options Yes, No, and Cancel. Saving the record does not mean that further additions or changes cannot be made. You will not be able to save the record without your hospital encryption key and data entered for Hospital code, Hospital number, Date and time of admission and Initial diagnosis.

4.4 Replication

Replication is a process that synchronises the data on your local PC with that on the CCAD servers. The replication facility allows you to work off line without a permanent network connection to the CCAD servers. While off-line you build up a database which is not synchronised with the central server until the process of replication has been performed. The advantage of not being permanently linked to the server is that your application will work much more quickly, especially if you have a slow internet connection. Replication performs a send and receive operation with the CCAD servers.

The first stage in the process of replication is to make a local replica of the MINAP database. This can be achieved through the Welcome Portal functionality. The Lotus Notes set-up has been configured by CCAD to replicate on Notes start and exit. This allows users to manually enter or import data into a local MINAP database that is located on their PC. When exiting Notes users may be informed by the message 'Do you want to send/receive documents to the server?' Choose Yes and this will run a replication event. The replication process will only send and receive information which is new or has changed since the last replication event. The replication process is very efficient and usually operates on checking for field level changes within a document. This will only update the corresponding field in the target document with the new value rather than copying an entire document between the source and target databases.

5 Adding a new patient record

In the Patient data view, click on Patients/All and then click on the Create New Patient button. This brings up the data entry application. You cannot save a record without entering the following fields: Hospital code, Hospital number, Date/time of admission, Initial diagnosis. Once those fields are entered you can access the record at any time to add to or modify the record, even after it has been sent to CCAD. On the left of the screen are 13 buttons allowing access to different pages for data entry.

The Hospital number (patient case record number) is an important field which used to identify when a patient is re-admitted. Please ensure that it is recorded accurately.

6 Demographics

Hospital number, Surname, First name, and Date of birth appear in the top panel of the screen and remain there to identify the patient. Age will appear after you have entered the Admission date in the **REPERFUSION** tab. After entering these, click on the **DEMOGRAPHICS** button at the top of the column of buttons to access the rest of the demographic details.

Hospital identifier (1.01) Your hospital code should default from your user ID.

Patient gender (1.07) The presence of *9. Not specified* as an option reflects a field shared with paediatric cardiology.

Post code (1.10) This is the post code of the main permanent residence. Full post code is required by the NHS. This is very important for local mortality/morbidity analyses. For visitors from abroad the NHS now has a pseudo post code.

NHS number (1.03) The NHS number is the unique identifier used to track the patient for mortality flagging via the National Health Service Central Register (NHSCR) or to track MINAP patients through the coronary intervention and surgical databases held on CCAD. All hospitals should now have access to NHS numbers for all patients. There is an algorithm in the Lotus Notes software to check the validity of the NHS number.

NHS Number verification status This is a new field, which is not part of the dataset. It is now included following a Department of Health Dataset Change Notice that requires that the NHS number is decrypted and displayed in all databases. Hospitals are required to verify each patients NHS number and upload the verification status. The options are

1. *NHS number present and verified.*
2. *NHS number present but not traced*
3. *Trace required*
4. *Trace attempted – no match or multiple match found*
5. *Trace needs to be resolved (NHS number or patient detail conflict)*
6. *Trace in progress*

Leave blank for overseas visitors, members of the armed services and travellers who have no NHS number.

Patient ethnicity (1.13) The patient's ethnic group as perceived by the patient. A new field which replaces 1.12 Patient ethnic group. The purpose of recording ethnicity has a single purpose: to identify patients whose ethnicity may have some bearing on co-morbidity and outcome. For example, Asians with higher rates of diabetes and premature coronary artery disease. Some years ago we were advised to change our recording of ethnicity to align this with the more detailed NHS classification. This, on reflection, was not helpful for MINAP's purposes, and we have agreed to revert to the original less complex field, which is a lower level classification that remains consistent with the NHS classification.

1. *Caucasian* Includes British, Irish, any other White ethnic group.
2. *Black* Includes Caribbean, African, Black British, any other Black ethnic group
3. *Asian* Includes Indian, Pakistani, Bangladeshi, Asian British, any other Asian ethnic group.
5. *Mixed* Includes White and Black Caribbean, White and Black African, White and Asian, any other ethnic group
6. *Not stated* Where the patient cannot or does not wish to state his/her ethnic group.
8. *Other* Includes Chinese, any other ethnic group.
9. *Unknown*

Admin status (1.09) Options 4. Other and 5. Visitor have been removed. Option 4 was very rarely used, and option 5, used to identify holidaymakers and foreign visitors is redundant as these can be identified by postcode and pseudo postcodes which can be used to identify the country of origin of all foreign visitors. The definitions of 1. *NHS*, 2. *Private* and 3. *Amenity* have been changed to align with the BCIS definitions.

GP practice/ PCT code (1.11) Please enter either the code for the practice of the patient's registered GP or select the PCT code from the drop down list . These codes should be available from your PAS system.

NHS number, Date of birth, GP practice/ PCT code and post code are fields which are stored encrypted on the CCAD servers and can only be accessed with your local hospital encryption key.

Configure PAS link

CCAD have developed a generic PAS link that will allow you to import demographic data from your local PAS system into the MINAP patient record. This may be helpful to you to reduce the chore of entry of demographics. The PAS link feature is not supported by CCAD so please do not contact the CCAD helpdesk for support with this feature. Click on Configure PAS link to configure the settings for your hospital. The client software and/or drivers for each of these connection types will need to be configured on the PC in order for the link to work. This is something that the local IT staff will need to configure.

7 Admission details

7.1 Initial diagnosis (2.01)

The Initial diagnosis is a working diagnosis whose primary purpose is to identify those patients with a diagnosis of definite ST elevation MI. This can include an Initial diagnosis made by an ambulance paramedic crew, or other clinician in a position to provide definitive treatment. Do not change Initial diagnosis on the basis of further ECGs or markers. The options are

1. Definite myocardial infarction The correct use is vital for analysis of Call to Needle times and Call to Balloon times. This option is only to be used where there are unequivocal changes of new ST elevation infarction or new LBBB on the initial ECG and appropriate history. LBBB of uncertain duration should be recorded as *3. Acute coronary syndrome*. If the initial ambulance ECG does not show ST elevation and the first hospital ECG does, the patient should be entered as *1. Definite myocardial infarction*. The new field, Patient location at the time of STEMI should be entered as *1. Onset of STEMI while patient not in hospital (STE on first ECG)*. Patients with ST elevation AMI, in whom the diagnosis was initially missed should be entered as *1. Definite myocardial infarction*.

Other points:

- If thrombolytic treatment has been given on the basis of either a pre-hospital ECG or the initial ECG then the Initial diagnosis must be *1. Definite myocardial infarction*, whether the use of thrombolytic treatment was correct or not. Similarly, for interventional centres, if a patient is referred to you from another hospital with a working diagnosis of ST elevation MI, you should enter these as *1. Definite myocardial infarction*. Where this is incorrect the Discharge diagnosis will make this clear.
- Patients who are incorrectly diagnosed as having ST elevation MI should always be logged regardless of treatment or outcome. (See Section 9 Interventional audit)
- Where there is LBBB and interventional treatment is given the Initial diagnosis is invariably *1. Definite myocardial infarction*.
- Where there is LBBB without ST elevation and lytic treatment was not given the Initial diagnosis should be *3. Acute coronary syndrome* unless it is clear from the notes that the clinician thought reperfusion treatment was contraindicated for any reason.

3. Acute coronary syndrome

Covers all other suspected acute coronary syndromes. Confirmation of the diagnosis awaits results of troponin assay. This should be used where there is strong likelihood of infarction on history and an abnormal ECG without significant ST elevation or new LBBB without ST segment elevation.

4. Chest pain ? cause A single episode of chest pain of possible cardiac origin where admission was thought necessary to exclude cardiac ischaemia. 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.

5. Other initial diagnosis A patient admitted with either another initial diagnosis (? pericarditis, pancreatitis etc), or who was already in hospital at the time of the event.

7.2 What procedure was performed at the interventional centre (4.29)

This field is for use by non interventional hospitals only, where the procedure concerned is performed at another hospital and the patient is returned to you. Hospitals performing less than 24/7 primary PCI should only use this for admission who are sent for primary PCI elsewhere. It should also be used when a patient is repatriated after direct admission to an interventional centre for primary PCI or rescue. This field is not intended for use with nSTEMI. It has the options the options

0. No angio or primary reperfusion treatment performed

1. Angiogram only

2. Primary angioplasty

3. Rescue angioplasty

4. CABG

5. Thrombolytic treatment

9. Unknown

7.3 Key times

Please record times for all patients who have ST elevation AMI diagnosed on the initial ECG, regardless of where performed, and who receive thrombolytic treatment or primary PCI. If a patient does not have definite ST elevation infarction then treatment delays need not be recorded. There is no need to enter Date/time of symptom onset, call for help, arrival of first responder and arrival of ambulance service for nSTEMI/other ACS patients.

Date/time of symptom onset (3.01)

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.

Date/time of call for help (3.02)

The time of the initial call by the patient, relative or attendant to a GP, NHS Direct, or the ambulance service. If a 999 call, use the call connect time which is the time the emergency call is connected to local ambulance control. It is not the time of the first ECG to show ST elevation. The call connect time should be taken from the ambulance CAD form. If the call was to a GP (or deputising service), or NHS Direct the call time is the call to the ambulance service. Call times only required for STEMIs.

When patients are transferred from a non interventional hospital to an interventional centre for primary PCI, the interventional centre should enter the time of the first call for help, as well as the time of arrival at the interventional centre. Call to balloon time is based on the initial call for help and the interventional centre may have to liaise with the non interventional hospital or ambulance service to obtain it.

Date/time of arrival of first responder (3.03)

This includes a community first responder or a paramedic in a car.

Date/time of arrival of ambulance (3.04)

This is the time of arrival of an ambulance capable of transporting the patient. This will help address concerns about prolonged call to hospital times (not infrequently a first responder can be there much earlier than the ambulance).

Date/time of arrival at hospital (3.06)

This refers to arrival at your hospital and must be completed - all patients must have an admission date and time. Time of arrival in hospital is the time of arrival of the ambulance at the front door. An accurate time is vital for any patient eligible for reperfusion treatment. Please use the time recorded by the ambulance service, not the time of the first ECG, nor the time of registration in A&E or admission to the CCU. Use A&E registration time only if patient self presented in A&E. The time 00.00 is reserved for date/time of admission of patients already in hospital. If a patient arrives on the stroke of midnight, enter 00.01

Interventional centres should use 3.06 Date/time of arrival at hospital as the Date/time of arrival at the intervention centre and use 3.46 Date/time of arrival at first (non interventional hospital) for arrival at the non interventional hospital if a patient is transferred to an interventional centre for primary PCI.

7.4 Admission method (2.39)

A new field replacing 2.02 Method of admission. The original field developed too many options over time. It was initially focussed on examining the process of admission of patients having thrombolytic treatment, and this is now less important. The new field merges all original options where the patient came to hospital by emergency ambulance into one. In every case the caller refers to the patient, other non professional in attendance or other health professional. Patients that have no admission method entered are excluded from Door to Needle, Call to Needle, Door to Balloon and Call to Balloon analyses so it is essential to complete this field for patients that receive thrombolytic treatment or primary PCI. The options are

1. *Direct admission via emergency service* Implies arrival by ambulance, helicopter.
2. *Self presenter to this hospital* Implies that the patient made their own way (public transport, brought by relative etc,) to hospital. Includes those advised to do so by GP.
3. *Already in this hospital* Should be used if the patient is already in hospital with another diagnosis. As you need to enter a date and time of arrival at hospital to save a record, you may enter 00.00 as the admission time if it is unknown. Patients already in hospital are excluded from Door to Needle, Call to Needle, Door to Balloon and Call to Balloon analyses. Use if the patient is attending a Rapid Access Chest Pain Clinic.

4. *Inter-hospital transfer for specific treatment* Specifically covers transfer to specialist centre for proposed treatment.

5. *Repatriation after coronary intervention* Return from interventional centre (after intended primary PCI etc.) The patient need not have been admitted to your hospital before repatriation.

6. *Other* To include patients admitted from clinics, or becoming ill while visiting hospital

9. *Unknown.*

7.5 Ambulance job number (3.05)

Select the relevant 3 letter ambulance trust code from the drop down box and enter the PRF/CAD number. The Ambulance job number is then automatically created from the date of call for help, the ambulance trust code and the PRF number. The ambulance job number allows ambulance trusts to identify their patients which are transferred from the MINAP database into the ambulance outcome database. It is important that you complete this field for all ACS patients but if the PRF/CAD is not available it is better to enter just the ambulance trust code than to leave the ambulance job number blank. Some Ambulance trusts attach a date to their PRF number; enter the complete number including the date.

7.6 Admitting consultant (2.02)

It is accepted that care may be shared between cardiologists and general physicians. Enter the clinician that has primary rather than advisory care of the patient during the first 24 hours or longer after admission to hospital. This will be subject to local procedures. In general, if the local arrangement is for a same day transfer to a cardiologist– within a few hours of admission, then record as a cardiologist. If it is a next day transfer then the admitting physician should be entered

7.7 Admission ward (3.17)

The purpose of this question is to determine where immediate care took place. It refers to the unit to which the patient is admitted either from A&E or directly by ambulance service and where patient will spend the majority of the first 24 hours in hospital. If patient admitted direct to catheter lab, enter facility to which patient admitted on leaving lab.

1. *Cardiac care unit* A unit providing level 2 facilities. This may be a cardiac care facility shared with ITU or HDU, or might be part of a cardiac ward or general ward, but providing a higher level of monitoring and cardiac nursing numbers and expertise.

3. *General medical ward* A medical ward without fixed monitoring facilities or additional cardiac nursing expertise.

7. *Cardiac ward (non CCU)* A cardiac ward, having staff with specific cardiac nursing expertise, but without necessarily higher numbers of staff/patient or central monitoring facilities.

7.8 Where was aspirin/other antiplatelet given (2.04)

Identifies if and when aspirin or other antiplatelet drug was first given to patient. This includes Clopidogrel and other thienopyridine inhibitors that may become available.

1. *Already on aspirin/antiplatelet drug* Regular use of aspirin/antiplatelet before this episode. Ignore the administration of additional doses by paramedics.

2. *Aspirin/antiplatelet drug given out of hospital* Aspirin or other antiplatelet drug started for this episode before admission. Patient not previously taking any antiplatelet drug.

3. *Aspirin/antiplatelet drug given after arrival in hospital*

4. *Aspirin/antiplatelet contraindicated*

8. *Not given*

9. *Unknown*

7.9 Place first 12 lead ECG performed (2.23)

This refers to the 1st ECG recorded, not necessarily the diagnostic ECG. It has the options

1. *Ambulance* An ECG performed in any location by ambulance paramedic staff as a result of an emergency call.

2. *In hospital*

3. *Other healthcare facility* Includes general practice or care home where the ECG was performed by a non paramedic. This could include a non interventional hospital before a patient is transferred for primary PCI.

9. *Unknown*

8 Reperfusion

This section gives advice on completing data entry for specific circumstances

- 8.1 Patient is ineligible for reperfusion treatment (too late etc.)
- 8.2 Patient is eligible for reperfusion treatment. See Section 19 for data entry for patients that are transferred for primary PCI.
- 8.3 Patient is initially not eligible for reperfusion treatment
- 8.4 Patient is already in hospital with another condition

Initial reperfusion treatment (3.39)

This refers to the initial reperfusion strategy performed in your hospital. The options are

0. None

1. Thrombolytic treatment

2. pPCI in house Primary PCI for STEMI/LBBB.

3. Referred for consideration for pPCI elsewhere. Intended primary PCI for STEMI/LBBB. At the time of referral (or data entry) it may not be known if reperfusion treatment was actually performed, but if the patient was transferred with this intention, this option should be used. These cases will subsequently be linked with the interventional centre record.

9. Unknown.

If a non-interventional hospital refers a patient for primary PCI, Initial reperfusion treatment should be 3. *Referred for consideration for pPCI elsewhere* and not 2. *pPCI in house*. If a hospital performs primary PCI less than 24/7, and sends patients elsewhere for primary PCI out of hours, care must be taken to select the correct option.

Reason reperfusion treatment not given (3.08)

Reperfusion treatment refers to both primary PCI and thrombolytic treatment and applies only to patients with ST elevation infarction. If the Initial diagnosis is Definite (meaning ST elevation) myocardial infarction you must record details of reperfusion (thrombolytic treatment or primary PCI treatment), or the reason why it was not given or delayed.

ECG determining treatment (2.03)

The ECG appearance upon which the treatment strategy is based. Record the appearances even if the patient did not receive reperfusion treatment. The ECG can include any 12 lead ECG performed before admission. If ST elevation consistent with infarction is recorded on any ECG during the episode, regardless of treatment, this should be recorded and the Discharge diagnosis should be Myocardial infarction (ST elevation). NB if ECG appearances are consistent with true posterior infarction this should be recorded as ST elevation, and noted in Site of infarction.

There are some changes to this field in V9.1. Option 6, Normal ECG has been removed in favour of 0. *No acute change*, which includes a normal ECG. Note, therefore, that any pre-existing changes, such as old ST elevation, that do not alter during this admission, should be recorded as option 0.

0. *No acute changes* ECG is normal or unchanged from one recorded before this admission.

1. *ST segment elevation*

2. *Left bundle branch block*

3. *ST segment depression*

4. *T wave changes only*

5. *Other acute abnormality* Other ECG abnormality related to this acute event.

9. Unknown.

ECG QRS complex duration (2.37)

This field allows audit of compliance with the NICE guidance on evaluation for use of implantable defibrillators. The ECG QRS complex duration must be a stable feature on ECGs during admission and has the options

0. *QRS complex <120 msec*

1. *QRS complex ≥120 msec*

9. *Unknown*

Site of infarction (2.36)

The options refer to the site of new ST segment elevation.

1. *Anterior*

2. *Inferior*

3. *Posterior* (where anterior ST depression replaces ST elevation)

4. *Lateral*

5. *Indeterminate* Use in the presence of very extensive changes.

9. Unknown

Enter the cardiographic site having the most extensive ST segment elevation. It follows that anterior embraces antero-septal, and antero-lateral, inferior embraces infero-lateral and infero-posterior, etc. Usually the site of the infarction will have been recorded in the patient record.

8.1 Patient is ineligible for reperfusion treatment

If reperfusion was not attempted enter Initial reperfusion treatment as *0. None*.

Enter Reason reperfusion treatment not given which has the options

0. None This is the default value which may be changed to the appropriate option.

1. Ineligible ECG No ECG shows unequivocal ST elevation or new LBBB. NB this choice is not compatible with an Initial diagnosis of *Definite myocardial infarction* because that diagnosis implies that an ECG was diagnostic of ST elevation infarction.

2. Too late A decision made in the light of a local protocol. If there is more than one reason for treatment not being given which includes *2. Too late*, then this option takes precedence over any other contraindication.

3. Risk of haemorrhage Includes risk of bleeding from any site, and from prolonged resuscitation.

4. Uncontrolled hypertension. A level of blood pressure determined by local protocol.

5. Administrative failure Use when, in the opinion of a senior clinician, thrombolytic treatment was withheld incorrectly.

6. Elective decision Use where a decision is made not to offer reperfusion treatment (eg. severe comorbidity or dying patient).

7. Patient refused treatment

8. Other For reasons not included above

9. Unknown Use where an eligible patient fails to receive thrombolytic treatment without a stated reason.

8.2 Patient is eligible for reperfusion treatment

If Initial reperfusion treatment is entered as *1. Thrombolytic treatment*, the screen changes in appearance, with new fields appearing and Reason reperfusion treatment not given disappearing.

Where was initial reperfusion treatment given (3.11)

Record where reperfusion treatment was started. There is additional information in Section 18 on how to enter patients that are transferred between interventional centre and non interventional hospitals before and after primary PCI.

Pre-hospital thrombolysis

Patients receiving pre-hospital thrombolytic treatment must have *1. Definite myocardial infarction* as the Initial diagnosis, even if review of ECG appearances on which treatment is based suggests otherwise. Patients having Prehospital thrombolytic treatment are identified when Where was initial reperfusion treatment given is *1. Before admission to hospital*.

Date/time of reperfusion treatment (3.09)

The time of onset of lytic treatment, whether infusion or injection. The time the first device is used in coronary artery (balloon, stent or extraction catheter). It is not the time the angioplasty guidewire is first introduced, even if this restores flow.

Delay before treatment (3.10)

Applies to all forms of reperfusion treatment and can occur at any time from the moment of arrival of the ambulance crew. However not all delays exclude patients from Call to Needle and Door to Needle analyses and only *15. Pre-PCI complication* excludes a patient from Door to Balloon or Call to Balloon analyses. Where it is policy for pre-hospital treatment to be given, any of the reasons for delay can be used by the paramedic crew. The default is *0. No* and means there was no operational delay regardless of the time to treatment. The options are available

1. Sustained hypertension Use according to local protocol.

2. Clinical concern about recent cerebrovascular event or recent surgery Use where delay results from the need to check on the significance of a recent cerebrovascular event or operative procedure.

3. Delay obtaining consent For use only where there is patient delay in confirming consent to routine thrombolytic treatment. Use only when the patient wishes to take time to consider use of a conventional (non trial) thrombolytic drug. Not to be used while consent or randomisation is obtained for any therapeutic trial. Use *6. Obtaining consent for therapeutic trial* in this circumstance.

4. *Initial ECG ineligible* should be used where, after an initially ineligible ECG, reperfusion treatment is used after development of ST elevation. These patients are not included in Door to Needle and Call to Needle analyses.
 5. *Cardiac arrest* Includes an arrest occurring before arrival in hospital or in hospital.
 6. *Obtaining consent for therapeutic trial* Use only for an approved study.
 7. *Hospital administrative failure* Includes any procedural reason why thrombolytic treatment was delayed in hospital.
 8. *Ambulance procedural delay* This includes any pre-hospital delay outside the control of the ambulance service, eg incorrect address, difficulty finding address, unable to gain entry to patient's house, patient reasons eg initial refusal to go to hospital or extended domestic arrangements, adverse weather conditions, crew had to wait for boat, helicopter delay, wait for police to gain entry, failure to cannulate.
 9. *Other* Use for any delay not covered by other options. If you wish to record other delays for local interest use one of the free fields, and enter 9. *Other* here.
 10. *Ambulance 12 lead ECG not diagnostic of STEMI* When initial ambulance 12 lead ECG is non diagnostic of STEMI.
 11. *Consideration of primary PCI* Where consideration for primary PCI leads to a delay in providing thrombolytic treatment.
 12. *Ambulance administrative delay* When initial ambulance 12 lead ECG is diagnostic of STEMI but patient outwith local criteria for paramedic thrombolytic treatment.
- There are options for primary PCI.
13. *Cath lab access delayed*
 14. *Delay in activating cath lab team*
 15. *Pre-PCI complication* Includes only cardiogenic shock with insertion of IABP and temporary pacing. Cardiac arrest is not considered as a pre-PCI complication.
 16. *Equipment failure.*

Only 1. *Sustained hypertension*, 2. *Clinical concern about recent cerebrovascular event or recent surgery*, 3. *Delay obtaining consent*, 4. *Initial ECG ineligible*, 5. *Cardiac arrest*, 8. *Ambulance procedural delay* and 9. *Other* exclude patients from Door to Needle or Call to Needle analyses. Only 15. *Pre-PCI complication* excludes from Door to Balloon and Call to Balloon. It is not mandatory to use a delay option if it is felt that the delay was trivial as this may exclude the record from analysis.

Thrombolytic drug (3.36)

The agent used for first thrombolytic treatment. Where streptokinase is started, and replaced because of side effects the second drug should be recorded.

Additional reperfusion treatment (3.40)

This is a field for further emergency reperfusion treatment where initial treatment is perceived to have failed. It has the options

0. *None*
1. *Rescue PCI in house* Emergency PCI for acute ST elevation MI for failed thrombolysis - commonly performed for failure of ST segment resolution or continuing ischaemic symptoms following lytic treatment. Performed in this hospital for either patients admitted directly or transferred from another hospital
2. *Referred for rescue PCI elsewhere* Intended rescue PCI. At the time of referral (or data entry) the treatment performed may not be known.
3. *Facilitated PCI* Use of this option should be restricted to use where primary PCI is intended as the reperfusion strategy with an upstream pharmacological agent used to try and "facilitate" the reperfusion process. The upstream agent might be a lytic or a 2b3a agent or a combination. These are now rarely used as the meta-analysis of trials to date suggest no benefit from studies involving facilitation.
4. *Additional dose of thrombolytic* Use where a second thrombolytic is given for perceived failure of reperfusion. Do not use when another lytic is substituted for streptokinase because of adverse effects occurring during SK infusion.

8.3 Patient location at time of STEMI (2.40)

This is a field developed in conjunction with BCIS to identify where ST elevation was first recognised to determine which records should be included in Call to Balloon and Door to Balloon analyses. This field is already available in the MINAP Notes and web applications and is now formally included in the dataset but please note that the definitions have changed slightly.

1. Onset of STEMI while patient not in hospital (STE on first ECG)

This implies that ST elevation was found on first ECG performed in an ambulance or other medical facility (GP surgery etc) before arrival at the first hospital or on the first ECG recorded in hospital for a

self presenter. If no ECG was taken prior to admission and first ECG recorded in hospital shows ST elevation then it should be assumed that STEMI developed before reaching hospital. This option should also be selected where an ECG was not considered diagnostic before admission, but STE is diagnosed on arrival at A&E.

2. STE first recorded on a subsequent ECG in, (or before arrival at) a non-interventional hospital.

The word subsequent applies to any ECG taken after an initial non-diagnostic ECG was performed at the non-interventional hospital. This group of patients will have arrived in hospital without a diagnosis of STE MI, and then develop ST segment elevation after hospital admission. The subsequent ECG may be at any time after admission to hospital. This option covers a spectrum from patients initially presenting with features consistent with ACS who go on to develop STEMI through to patients who are admitted for some other condition who develop STEMI while in hospital.

3. STE first recorded on a subsequent ECG in, (or before arrival at) the interventional hospital

The word subsequent applies to any ECG taken after an initial non-diagnostic ECG was performed at the interventional hospital. This group of patients will have arrived in hospital without a diagnosis of STE MI, and then develop ST segment elevation after hospital admission. The subsequent ECG may be at any time after admission to hospital. This option covers a spectrum from patients initially presenting with features consistent with ACS who go on to develop STEMI through to patients who are admitted for some other condition who develop STEMI while in hospital. Note. Even if patients have long transfers (for example in a rural setting), if on arrival at hospital they are diagnosed as having STEMI, call to treatment times will be from initial call to initiate emergency ambulance transport.

Place STE was first recognised	Option
First ECG before arrival in any hospital (either interventional or non-interventional)	1
First ECG after arrival in any hospital for self presenter	1
First ECG in hospital after non-diagnostic ECG in community	1
First ECG in hospital when no ambulance ECG performed	1
Subsequent ECG in non-interventional hospital	2
Subsequent ECG in interventional hospital	3

The following intervals are calculated from your data

- Call to hospital
- Door to reperfusion (Door to Needle or Door to Balloon)
- Call to reperfusion (Call to Needle or Call to Balloon)
- Onset of symptoms to arrival in hospital
- Onset of symptoms to reperfusion (Onset to Needle or Onset to Balloon)

Reperfusion is the time of the onset of thrombolytic treatment or time of first balloon inflation. For primary PCI the time of arrival at hospital is the time of arrival at the interventional centre. Time of arrival at a non interventional hospital is recorded with the field 3.46 Date/time of arrival at non interventional hospital.

Missed diagnoses

The diagnosis of ST elevation AMI may be missed by inexperienced junior staff and as a result the use of reperfusion treatment may be delayed. Where an ECG is subsequently considered sufficiently diagnostic that in the opinion of a more experienced clinician treatment should have been given on the basis of an earlier ECG, this should be recorded as Delay before treatment using the option 7. *Hospital administrative failure*. The Initial diagnosis should be recorded as 1. *Definite myocardial infarction*. If these patients received thrombolytic treatment they are now included in Door to Needle analyses when previously there were excluded. You should keep a local record of these for training purposes.

Inappropriate thrombolysis

Sometimes thrombolytic treatment is given where in retrospect the indication may have been uncertain (old MI with persisting ST elevation and new non cardiac chest pain is an example). Please enter all cases of 'inappropriate' thrombolytic treatment whether in hospital or pre-hospital. The discharge diagnosis will identify these cases. If they are not entered there is no chance of anyone learning by experience.

8.4 Patient is already in hospital

Patients already in hospital with another condition have a high mortality if they then have a myocardial infarction. Logging them is important in order to analyse case fatality. If these patients receive thrombolytic treatment or primary PCI they are excluded from Door to Needle and Door to Balloon analyses.

9 Interventional audit

These fields are for use in interventional centres only. They allow examination of the process of evaluation for primary PCI and rescue PCI. They are also appropriate for coronary interventions for nSTEMI patients where a MINAP record exists. Other hospitals, including those referring patients for coronary intervention, should ignore these fields. A MINAP record should be started, and these fields completed, if the primary PCI pathway is activated even if the patient did not receive the expected intervention.

9.1 Date/time of arrival at non interventional hospital (3.46)

Date and time of arrival (when the wheels stop turning) at non interventional hospital. Where a hospital does not provide 24/7 intervention it is a non interventional hospital outside of these hours.

9.2 Assessment at the non interventional hospital (3.47)

Place of assessment after arrival at non interventional hospital with options

0. *No contact with a non interventional hospital* Where a hospital provides a less than 24/7 interventional service, it should be categorised into interventional / non-interventional depending on whether the lab is open at the time of presentation.
1. *Patient remains in ambulance* When the ambulance is parked in hospital grounds in order to facilitate assessment by a member of hospital staff.
2. *A&E* Patient is moved into A&E for assessment.
3. *Acute assessment unit* Other non cardiac specific ward.
4. *CCU / cardiac facility* A cardiac facility is any area with specialised nursing staff
5. *Self referral* The patient made own way to non interventional hospital. These patients are excluded from Call to balloon analyses.
6. *Already in hospital* The patient was admitted prior to this event. Eg., already in hospital with ACS, and develops new symptoms with ST elevation or after admission with ACS, transferred for intervention as part of routine care for ACS.
7. *Other*
9. *Unknown*

9.3 Assessment at interventional centre (3.48)

Place of assessment after arrival at interventional centre with options

1. *Assessed in A&E* Self presenters might be assessed here.
2. *Acute assessment unit* A non specific area for assessment of acute admissions.
3. *CCU / cardiac facility* A facility with specialised nursing staff.
4. *Catheter laboratory* Including areas immediately adjacent.
5. *Already in hospital* Already in interventional hospital.
9. *Unknown*

9.4 Intended reperfusion procedure (3.49)

Intended reperfusion treatment after assessment at interventional centre. Where the diagnosis is nSTEMI, option 4 must be used.

0. *None*
1. *Primary PCI*
2. *Rescue PCI* A procedure for continuing symptoms / features of non reperfusion for STEMI.
3. *Thrombolytic treatment* If intended reperfusion treatment was with lytic drug - which was not given - use MINAP 3.08 to explain why. If lysis used, existing MINAP fields will cover.
4. *Other coronary intervention* Covers all interventions other than for acute management of STEMI, eg elective intervention for STEMI / nSTEMI or for new symptoms.
9. *Unknown*

9.5 Procedure performed (3.50)

Intended treatment may not necessarily occur; lab may be unavailable, etc.

1. *No angiogram*
2. *Angiogram but no PCI*
3. *Angiogram and PCI*
9. *Unknown*

9.6 Why was no angiogram performed? (3.51)

This field will identify the reasons why patients for whom primary PCI was intended did not receive it. It became clear that option 0. *Not applicable* was being very widely used where angiography was performed, and this is now accepted as the purpose of the option. The definition of Option 5 has changed

and includes any pre-existing co-morbidity, and option 4 (unchanged) any immediate complication that rendered angio inadvisable

0. *Not applicable* Where angiography has been performed.
1. *Diagnosis not ACS* Another diagnosis, not an acute coronary syndrome, was established.
2. *Patient refused*
3. *Patient died*
4. *Complication before angio could be performed* An acute medical event resulting in cancellation of a planned angiogram / intervention.
5. *Angio inappropriate due to co-morbidity* Definition changed to Patient co-morbidity made angio inappropriate. For use where there is advanced malignancy, dementia, progressive neurological disease or other conditions having an immediate impact on prognosis. Includes other clinical reasons identified by the clinician.
6. *Technical failure* Any operator related failure, including failure of arterial access.
7. *Lab unavailable* Access to lab not possible at a time when lab normally available.
8. *Other* Including absent staff or equipment problems.
9. *Unknown*

9.7 Why was no intervention performed? (3.52)

As with 3.51 option 0. *Not applicable* was being widely used where PCI had been performed, and this is accepted as the purpose of the option and the definition has changed. Where an angiogram has not been performed this field should be left blank.

0. *Not applicable* Definition changed to Where primary PCI or other coronary intervention has been performed.
1. *Patient refused* Patient refused intervention after angio.
2. *Patient died* Patient died after angio.
3. *Complication before PCI could be performed* An acute medical event preventing intended intervention from starting.
4. *PCI felt to be inappropriate* eg because of co-morbidity, eg. acute VSD, cardiac rupture; acute MR; coronary spasm, spontaneous dissection; thrombus treated with drug therapy (e.g. ReoPro and heparin), etc.
5. *Angiographically normal coronaries / mild disease / Infarct Related Vessel unclear*
6. *Surgical disease*
7. *Technical failure* Any technical / operator failure after starting interventional procedure, including no arterial access
8. *Other*
9. *Unknown*

9.8 Referring hospital code (4.21)

Code of hospital from which patient was referred for any investigation or intervention. It should be entered by the interventional hospital when patients are transferred for primary PCI/intervention.

10 Examinations

10.1 Systolic BP (2.20)

The first systolic blood pressure recorded after admission to hospital. The patient should be in a stable cardiac rhythm, i.e. sinus or chronic AF. Where the presenting rhythm is a treatable tachyarrhythmia, the first stable systolic BP after treatment should be used.

10.2 Heart rate (2.21)

The heart rate is recorded from the first ECG after admission to hospital, whilst in a stable cardiac rhythm ie sinus rhythm, or chronic AF. In complete heart block record ventricular rate. Where the presenting rhythm is a treatable tachyarrhythmia, the first stable heart rate after treatment should be used.

10.3 Killip class (2.41)

This new field is an integral part of the GRACE predicted mortality score. It should be scored as the worst category developing during the admission.

1. *No evidence of heart failure*
2. *Basal crepitations and/or elevated venous pressure*
3. *Pulmonary oedema* Extensive lung crepitations consistent with pulmonary oedema, or confirmatory X ray evidence
4. *Cardiogenic shock* Hypotension, poor tissue perfusion and oliguria due to ventricular dysfunction in the presence of raised filling pressures.
8. *Not applicable* Where patient dies or is transferred early in the admission.
9. *Unknown*

10.4 Height (2.29) and Weight (2.30)

Values for height and weight may be entered in imperial units only in the MINAP application which will be converted to metric units and the BMI calculated automatically. Local or commercial applications must use metric measure, with height recorded in cm. and weight in kg.

11 Tests

Serum cholesterol (2.15) A value recorded during the first 24 hours after admission.

Serum glucose (2.28) taken on admission (not necessarily fasting). A non lab capillary glucose with a calibrated glucometer is acceptable. Note that admission Blood glucose has been re-instated in the data completeness score.

Haemoglobin (2.35) Recorded within 24 hours of admission (g/dL).

Creatinine (2.34) Recorded within 24 hours of admission (micromol/L.)

Cardiac markers raised (2.14)

The definition has been modified to align with the 'universal' definition of myocardial infarction. This field is only to be used for biomarker changes due to the acute event or re-infarction, and not for post procedural values.

0. *No* An absence of any rise in cardiac bio-markers (usually troponin) to a value above the 99th centile of the upper reference limit for the assay
1. *Yes* A rise in cardiac bio-markers (usually troponin) with at least one value above the 99th centile of the upper reference limit for the assay employed.

Peak troponin (3.19)

Should be the highest value recorded and is valuable for prognostic reasons regardless of any diagnostic label given to the patient. This field is numeric. No characters can be added. It is recognised that troponin may be reported in near patient tests as < (less than) or > (greater than) a certain value. Please follow the following conventions: If the reported value indicates that there is no (analysable) elevation of troponin enter zero, 0. If the reported value is greater than the upper limit of the assay range, enter the value at the upper limit: ie >50 ng/ml, enter 50. If on near patient testing a range is given, enter the value at the upper limit: ie between 0.05 and 0.5 ng/ml, enter 0.5.

Troponin assay (3.37)

Please indicate which assay is used locally. A new option has been added 3. *High sensitivity Troponin T.*

Do not enter zero for any numeric field where the value is not known. Leave blank.

Non invasive tests

Exercise test (4.10), Echocardiography (4.11), and Radionuclide studies (4.12) performed at this admission. If there is no mention of these in the notes then record *9. Unknown* rather than *0. No*.

Left ventricular ejection fraction (2.31)

Measured during this admission by echo, angiogram, radionuclide or magnetic resonance study. The options have been renamed

1. *Good* corresponding to an LVEF of $\geq 50\%$
2. *Moderate* corresponding to an LVEF of 30-49%
3. *Poor* corresponding to an LVEF of $< 30\%$.

These values now correspond with BCIS definitions of good, moderate and poor function.

12 Previous medical history

Not all conditions are strictly risk factors, but the list includes conditions which might have some impact on use of treatments, such as Beta blockers in the presence of chronic obstructive pulmonary disease. There is a choice for each condition of *0. No*, *1. Yes*, or *9. Unknown*. Diabetes and Smoking status have additional options.

Previous AMI (2.04) Any previously validated episode of acute myocardial infarction.

Previous angina (2.06)

Symptoms due to cardiac ischaemia developing or already in existence at least 2 weeks prior to admission, and continuing up to admission.

Hypertension (2.07)

A patient already receiving treatment (drug, dietary or lifestyle) for hypertension or with recorded BP $> 140/90$ on at least 2 occasions before admission..

Hypercholesterolaemia (2.08) Elevation of serum cholesterol requiring dietary or drug treatment.

Peripheral vascular disease (2.09)

Presence of peripheral vascular disease, either presently symptomatic or previously treated. Include renovascular disease and aortic aneurysm.

Cerebrovascular disease (2.10)

A history of cerebrovascular ischaemia, including transient cerebral ischaemic episodes as well as events with deficit lasting > 24 hours.

Asthma or COPD (2.11) Any form of obstructive airways disease.

Chronic renal failure (2.12)

Defined as creatinine consistently more than 200 micromol. Do not enter *1. Yes* for values less than 200 micromol.

Heart failure (2.13) Pre-existing treated heart failure.

Smoking status (2.16)

Diabetes (2.17)

0. Not diabetic The definition has changed to *0. Not known diabetic*. This small change stresses that regardless of admission glucose, a patient is not diabetic until this is formally confirmed by appropriate investigation. This must not be changed even if a diagnosis of diabetes is subsequently confirmed.

Previous PCI (2.18) A percutaneous coronary intervention at any time prior to this admission.

Previous CABG (2.19) Coronary artery bypass grafting at any time prior to this admission.

Family history of CHD (2.32) Identifies a family history of premature CHD by diagnosis in males before 55 years or females before 65 years.

13 Therapy

The purpose of the section is to allow you to record therapy in use prior to admission and given during the admission.

13.1 Therapy in use prior to admission

There are four fields to record the use of **Beta blockers (2.24)**, **ACE inhibitors/ Angiotensin receptor blockers (2.25)**, **Statins (2.26)** and **Thienopyridine inhibitors (2.38)** (eg Clopidogrel and Prasugrel) prior to admission. Each has options of 0. *No*, 1. *Yes* and 9. *Unknown*.

13.2 Therapy given during admission (3.20-3.34)

For all drugs there are options

0. *No*

1. *Yes* If introduced while in hospital or on treatment at admission and continued..

9. *Unknown*.

13.3 Management of hyperglycaemia/diabetes

Patients presenting with significant hyperglycaemia have a considerably increased mortality, especially those who are not known to be diabetic. There is increasing evidence that control of hyperglycaemia in the acute phase of ACS may be very important.

13.3.1 In patient management of hyperglycaemia/diabetes (3.41)

Treatment given during the first 24 hours (or longer), even if this regime is subsequently changed. Each insulin regime may be in combination with oral therapy. Diabetic treatment should be recorded regardless of whether the patient is known to be diabetic or presents for the first time with hyperglycaemia. The options are

0. *None* No pharmacological diabetic treatment was given during the admission.

1. *Glucose insulin regime*. Insulin by pump with additional IV glucose according to local protocol.

2. *Insulin pump* Insulin by pump without additional IV glucose.

3. *Multi dose insulin* 3 or more individual doses of subcutaneous insulin/24 hours, either as regular doses or sliding scale insulin. This may be a continuation of the preadmission regime.

4. *Other pre-admission insulin regime*. Insulin regime of 2 or less doses per 24 hours.

5. *Oral medication only* Any form of oral medication without any insulin.

7. *Diet only* For known diabetics continuing (low carbohydrate) diet without additional medication.

9. *Unknown*.

13.3.2 Diabetic therapy at discharge (3.42)

If oral therapy is given in combination with insulin record under the appropriate insulin regime. There is a new option 4. *Insulin plus oral medication* and change in definition of 6. *Not applicable*.

0. *None*

1. *Multi dose insulin regime* Insulin given three or more times daily.

2. *Other insulin regime* Insulin less than three times daily.

3. *Oral medication* Any oral medication used without insulin.

4. *Insulin plus oral medication*

5. *Diet only* A low carbohydrate diet for diabetes.

6. *Not applicable* A change in definition to For patients who die or are transferred to another hospital.

9. *Unknown*.

14 Complications

14.1 Bleeding complications (4.03)

This should be used for bleeding following any therapeutic intervention, including pre-hospital thrombolysis or primary PCI (including sheath removal), and anticoagulant or antithrombotic treatment, but excluding bleeding complications following repeat angiography/intervention. Use should be limited to bleeding occurring within 24 h of the finish of any therapeutic intervention. Options are given in order of precedence: use the first option that applies.

0. *None*

1. *Intracranial bleed* Of any severity, should ideally be confirmed by scanning.

2. *Retroperitoneal haemorrhage* Of any severity, should ideally be confirmed by scanning.

3. *Any bleed with Hb fall >5g* From any site except options 1 and 2.
4. *Any bleed with Hb fall >3 and < 5g*
5. *Any bleed with Hb fall < 3g*
9. *Unknown.*

14.2 Death in hospital (4.04)

This is important for analysis of case fatality, particularly deaths related to treatment. Please check that details of the cardiac arrest have been completed, even if resuscitation was not attempted. Death in hospital is recorded in several places; please ensure your entries do not contradict each other.

14.3 Re-infarction (4.24)

Refers to re-infarction occurring during this admission. This is defined as ischaemic pain or other symptoms consistent with acute cardiac ischaemia (eg sweating, nausea, hypotension) persisting until relieved by analgesia or nitrates, accompanied by new cardiographic changes (new ST elevation or depression or T wave changes in the territory of the initial event). These features must be accompanied by acute marker of cardiac necrosis to more than the upper limit of normal or an increase to a value \geq 50% greater than the last recorded value. The options are

0. *No*
1. *Yes*
9. *Unknown*

MINAP makes no attempt to record re-occlusion, which can really only be confirmed angiographically. Re-infarction is a clinical presentation of re-occlusion, which can be silent.

14.4 Cardiac arrest

You should record cardiac arrests for patients with infarction who arrest in hospital. You should also log patients with infarction who have an out of hospital cardiac arrest and who survive to be admitted to hospital. Entries to the four fields on this form should relate to the first arrest and not to any subsequent event. Cardiac arrest excludes syncope or profound vagally-mediated bradycardia. Enter the date and time of death if resuscitation not attempted. Arrests occurring in patients with AMI in A&E who do not survive may not come to your notice. Please attempt to log these patients when the underlying cause of the arrest was thought to be AMI.

Cardiac arrest location (3.14)

The default is *1. No arrest*. If you enter any option other than *1. No arrest* further fields appear for Date/time of first cardiac arrest, Presenting rhythm and Outcome of arrest.

Date/time of first cardiac arrest (3.13)

The dataset only applies to first arrests.

Arrest presenting rhythm (3.15)

2. *VF/pulseless VT* Includes any other haemodynamically catastrophic tachyarrhythmia.
3. *EMD* Also referred to as pulseless electrical activity.

Outcome of arrest (3.16)

Applies only to outcome of the first arrest. This should include arrests 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 must be recorded in the field Death in hospital, and in Discharge Destination.

If **Outcome of arrest** is entered as *1. No return of circulation*, then Death in hospital will default to From MI and Discharge destination will default to Death in the MINAP application. The Discharge date will be the Date of death. . NB Those using commercial / local applications must ensure that when *1. No return of circulation* is recorded as the outcome of arrest, then Death in hospital must also be completed.

15 Investigations/interventions

These fields allow tracking of patients following AMI or acute coronary syndromes who have angiography and interventions either locally or elsewhere. Both the frequency with which patients receive further interventions, and the delays involved can now be recorded and reviewed locally. Developments in provision of angiography and interventional facilities mean that different combinations of site for angiography and intervention may occur. The dataset caters for this.

Coronary angiography (4.13)

Coronary angiography performed or arranged but does not refer to coronary angiography preceding primary PCI or rescue PCI. If, after thrombolytic treatment a patient is then referred to an interventional centre for angio and urgent PCI (ie not primary PCI) you should enter 4.13 Coronary angiography as 3. or 4. *Symptom/protocol driven investigation at another hospital*. Unless you know what intervention occurred, 4.14 Coronary intervention should be recorded as 9. *Unknown*. The interventional centre will record what actually happened and we will be able to link your record with the interventional centre record. It is essential to enter the code of the interventional centre so that we can link these records. As coronary angiography is a data completeness field, it is particularly important to complete this field for nSTEMI patients. Use 9. *Unknown* rather than leaving the field blank. For patients that have primary PCI, use 8. *Not performed* rather than blank as previously recommended.

There are options for

6. *Not applicable* For use when there is advanced malignancy, dementia, progressive neurological disease or other conditions having an immediate impact on prognosis. Includes other clinical reasons identified by the clinician.

7. *Patient refused*.

Coronary intervention (4.14)

Coronary intervention during this episode performed either in your hospital or by referral to another hospital. Do not use this field for primary PCI or rescue PCI which are covered by Initial reperfusion treatment and Additional reperfusion treatment. Enter the procedure if you know what procedure has been done or if the intervention takes place elsewhere and you have no information use 9. *Unknown*. There are options for

6. *Not applicable* For use when there is advanced malignancy, dementia, progressive neurological disease or other conditions having an immediate impact on prognosis. Includes other clinical reasons identified by the clinician.

7. *Patient refused*

There is no need for an interventional centre to start a MINAP record when a patient is transferred for angiography/intervention that is not part of the initial reperfusion treatment.

Date of referral for investigation/intervention (4.15)

Whether angiography or intervention is to be performed locally or at another centre it is useful to record delays before angiography or transfer. Dates can be recorded by clicking on the calendar button.

Daycase transfer date (4.17)

If the patient is transferred as a daycase, and is expected to return, the patient is not discharged. If transferred, and not expected to return, then the patient is discharged from you and this must be recorded in Date of discharge and Discharge destination (2. *Other hospital*). This is done automatically in MINAP. If date of transfer and date of discharge are recorded as the same date, it will be assumed that the patient has been transferred to another hospital (ie not a day case).

Local angio date/time (4.18)

Where this takes place during the present admission. It is now a Date/Time field, allowing interval from arrival to angiography to be accurately determined.

Local intervention date (4.19)

Where the intervention takes place during the present admission and is performed on site. This date will usually be the same as Local angio date.

Interventional centre code (4.20) Code of the interventional centre, for use by the referring hospital.

Date of return to referring hospital (4.26) A field for use when a patient is admitted to a non interventional hospital, transferred to an interventional centre and returns to the non interventional hospital.

16 Discharge details

16.1 Date of discharge (4.01)

Includes date of transfer to another hospital (but not as a day case), and date of death.

16.2 Discharge diagnosis (4.02)

1. *Myocardial infarction (ST elevation)* There should be a history consistent with the diagnosis. The diagnosis requires the presence of (new) cardiographic changes of ST elevation consistent with infarction of ≥ 2 mm in contiguous chest leads and/or ST elevation of ≥ 1 mm ST elevation in 2 or more standard leads. (New LBBB is included; although new ST elevation may be apparent in the presence of LBBB). There must be troponin elevation above the local reference range (See 3. *Threatened MI*). This group includes all patients with STEMI regardless of whether typical changes were evident on the initial ECG or developed subsequently. If ST elevation is present on any ECG during the episode in association with elevated troponin, then the diagnosis must be 1. *Myocardial infarction (ST elevation)*.

3. *Threatened MI* With the adoption of a universal definition for myocardial infarction this category has become redundant. If there is a combination of ST segment elevation, no matter how transient, and troponin release the final diagnosis must be ST elevation infarction. If there is ST elevation and no troponin release the Discharge diagnosis is 4. *Acute coronary syndrome troponin negative*.

4. *Acute coronary syndrome (troponin positive)*

ACS troponin positive now includes all those patients previously defined as nSTEMI. There must be symptoms consistent with cardiac ischaemia and there will normally be cardiographic changes consistent with this diagnosis. Troponin elevation above locally determined reference level is mandatory. Use this option if a patient is transferred to an interventional centre before a troponin is measured, as the probability of troponin being elevated for transferred patients is very high.

5. *Acute coronary syndrome (troponin negative)*. Symptoms consistent with cardiac ischaemia without troponin release associated with dynamic (fluctuant) ECG changes consistent with ischaemia.

6. *Chest pain of uncertain cause* A patient admitted with chest pain not accompanied by significant cardiographic change nor 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. The cardiograph may be abnormal, but there are no acute or dynamic changes.

7. *Myocardial infarction (unconfirmed)* This diagnosis must only be applied to patients who die in hospital or are transferred elsewhere before biochemical confirmation of infarction can be confirmed.

8. *Other diagnosis* Use where a patient is admitted with clinical suspicion of cardiac pain and where any diagnosis other than cardiac ischaemia is confirmed.

NB an elevated troponin value must have an explanation! Unless there is another agreed cause for the elevation a diagnosis of troponin positive acute coronary syndrome must be considered.

16.3 Discharge destination (4.16)

8. *Other specialty in same hospital* Where a patient is transferred to another specialty for a specific reason, such as rehabilitation following a CVA, or nephrologists for dialysis. It does not include a transfer from cardiologists to general physicians for continuing care of the original event before discharge.

16.4 Followed up by (4.23)

Refers to a formal outpatient arrangement. The options are

1. *Cardiologist* Includes the cardiology team including nursing staff working semi-autonomously.

2. *Non cardiologist*

3. *No follow up* An option, where no arrangement for hospital follow up is made by the discharging hospital. Do not use when the patient is transferred elsewhere, use 4. *Not applicable*.

4. *Not applicable* An option for patients who die or are transferred to another hospital previously entered as 9. *Unknown*.

9. *Unknown*

16.5 Cardiological care during admission (2.33)

A field with options

0. *No*

1. *Yes*
9. *Unknown*

Record if the patient was seen by a cardiologist (or member of clinical team working under the supervision of a cardiologist) during admission.

16.6 Cardiac rehabilitation (4.09)

Refers specifically to further rehabilitation arranged after discharge (as rehabilitation in the sense of lifestyle advice will already have been given).

8. *Not indicated* Use when further rehabilitation may not be indicated because of severe comorbidity etc.

16.7 Secondary prevention medication on discharge

Secondary prevention medication includes

Beta blocker (4.05)

Angiotensin converting enzyme inhibitor or angiotensin receptor blocker (4.06)

Statin (4.07)

Aspirin (4.08)

Aldosterone antagonist (4.28)

Thienopyridine inhibitor (4.27)

The option 8. *Not indicated* has been added for Discharged on Thienopyrine inhibitor and Discharged on aldosterone antagonist.

For all drugs, record 1. *Yes*, if treatment was started in hospital, or continued if taking it before admission.

0. *No* when a patient should have been prescribed such medication, but was not.

2. *Contraindicated*

3. *Patient declined treatment* should be used for patients who self discharge.

4. *Not applicable* should be used for patients who die or are transferred to another hospital. Assume that the receiving hospital will arrange secondary prevention. These patients will not be included in analyses.

8. *Not indicated* when there is no clinical reason for the patient to be on the medication

9. *Unknown* used where information about this field is not available or not known.

Analysis of the use of secondary prevention medication on discharge is based on all troponin positive ACS patients. These include discharge diagnoses of

1. *Myocardial infarction (ST elevation)*

3. *Threatened MI*

4. *Acute coronary syndrome (troponin positive)*

17 NICE guidance for secondary prevention

These fields are not mandatory but allow you to audit information documented in the case record against NICE secondary prevention guidance.

17.1 Smoking cessation advice given (5.1)

The option 2. *Planned in rehab* has been added.

17.2 Dietary advice given during this admission (5.2)

The option 9. *Unknown* has been added.

18 User definable fields

There are 32 user definable fields. There is help on entering a title for the field and any combination of text or figures can be entered for local use. Beware of using free text, it is very hard to analyse! The fields have expanding brackets into which you can type data. If you enter too much, the data will spread onto a new line. The data can be downloaded for you to analyse. CCAD will store these data centrally and given the same degree of security as the other data. They cannot be accessed by MINAP or another hospital. You can perform local research or audit, and can link up with other hospitals to do collaborative work.

19 Guidelines for entering patients who have primary PCI angiography/intervention (PCI), with or without transfer to other hospitals

19.1 Primary PCI

Patients having primary PCI for ST elevation infarction may be admitted to more than one hospital. This means that two MINAP records, which CCAD will have to link together, may have to be created for a single 'superspell'. It is very important that MINAP has the information with which to link records, and this is explained below. In time the merged data will be available to the referring hospital. The development of the web application will make linking of MINAP and BCIS records much easier.

A MINAP record must be started for a patient with ST elevation infarction when the patient is admitted to your hospital. A temporary (pit stop) visit to A&E, whether arriving by ambulance or not, before transfer to the interventional centre does not count as an admission. A MINAP record need only be started if the patient is formally admitted to hospital.

Interventional centres must always make a MINAP record for a patient admitted with ST elevation infarction even if the patient does not receive the expected intervention. Where patients remain in the interventional centre for limited time a reduced record must still be made, see Rapid repatriation patients in Section 19.1.1. Data entry is described for patients admitted to interventional centres or non interventional hospitals.

Summary for recording details of an admission involving primary PCI

- A non interventional hospital will only make a record if the patient is formally admitted – either before transfer for primary PCI, or on return from an interventional centre after the procedure, (repatriation).
- An interventional centre performing primary PCI must make a MINAP record for every patient having primary PCI or activating the primary PCI pathway.

19.1.1 Interventional centres

A MINAP record must be completed for all patients transferred or admitted to your hospital with a working diagnosis of STEMI (this includes patients transferred where the Initial diagnosis is not correct (pericarditis, old MI with persisting old ST elevation, etc). If the patient stays in the interventional centre to discharge then this hospital must take responsibility for the full MINAP record.

- If a patient is transferred to you after admission at another hospital, Admission method is *4. Inter-hospital transfer for specific treatment*
- Complete Patient location at time of STEMI
- Complete Referring hospital code (where did the patient come from is important in order to link the 'episode').
- Complete the Interventional audit fields (Section 9)
 - Date/time of arrival at non interventional hospital
 - Assessment at the non interventional hospital
 - Assessment at interventional centre
 - Intended reperfusion procedure
 - Procedure performed
 - Why was no angiogram performed?
 - Why was no intervention performed?
- If discharged home secondary prevention medication fields should be completed.
- If discharged to another hospital, provision of secondary prevention medication is their responsibility, and should be recorded as *4. Not applicable* by the interventional centre.
- Fields relating to use of intervention/angiography should not be completed for patients having primary PCI or rescue procedures.
- If a patient is transferred back to another hospital, Discharge destination is *2. Other hospital*.
- Date of discharge is used to link this episode to that in the other hospital and it is essential to complete it.

Rapid repatriation patients

Some interventional centres employ a treat and return strategy. A reduced MINAP dataset has been developed by colleagues in Leeds which we recommend, and is listed below.

DEMOGRAPHICS
ADMISSION DETAILS

Initial diagnosis
Date/time arrival at interventional centre
Admission method
Date/time of onset of symptoms/call for help
Ambulance job number
Patient location at time of STEMI

REPERFUSION

Initial reperfusion treatment
Delay before treatment
ECG determining treatment
Date/time of balloon inflation

INTERVENTIONAL AUDIT

Date/time of arrival at non interventional hospital
Assessment at non interventional hospital
Assessment at interventional centre
Intended reperfusion procedure
Procedure performed
Why no angiogram performed
Why no intervention performed

COMPLICATIONS

Bleeding complications
Death in hospital

INVESTIGATIONS/INTERVENTIONS

Referring hospital code if appropriate

DISCHARGE DETAILS

Discharge date
Discharge diagnosis
Discharge destination

Where rapid repatriation is used for primary PCI (or the patient sent back to the local hospital having first come direct to the interventional centre), a reduced MINAP record will also be made in the non interventional hospital. See below.

The patient who does not have a primary PCI

Patients referred for consideration of primary PCI may not have a procedure performed. This may be because of a death before the planned procedure, a misdiagnosis, or that after angiography it was decided not to proceed. Please enter these patients into MINAP and, in particular, the Interventional audit fields that explain why no procedure was performed.

19.1.2 Non interventional hospitals

There are two possible scenarios

1) The patient is admitted first to a non interventional hospital, (not just an A&E pit stop) sent to an interventional centre and returns after primary PCI

There are several circumstances in which this might happen, but typically a patient might be admitted with chest pain and develops ST elevation some time after admission for which primary PCI is appropriate.

Start a MINAP record

- Identifiers such as NHS number are vital
- Initial reperfusion treatment is 3. *Referred for consideration for pPCI.*
- Consider the patient to be transferred as a day case (even if away >24 h) so no date of discharge need be entered now but should be entered as the discharge date when the patient is finally discharged.
- Interventional centre code (where the patient went for primary PCI)
- If and when the patient returns to you, complete MINAP record with
 - Date of return to referring hospital (ie your hospital)
 - What procedure was performed at the interventional hospital
 - Secondary prevention medication
 - Discharge date
 - Discharge destination
 - Discharge diagnosis

What to do if patient does not return?

- Complete the record as if patient was discharged to another hospital. Secondary prevention is completed as 4. *Not applicable*.

2) The patient comes to a non interventional hospital for the first time after having primary PCI

This should also be used where the patient has a pit stop at the non interventional hospital (but is not admitted) and is transferred on to the interventional centre. The interventional centre will make the main MINAP record and so the non interventional hospital record should be a skeleton record.

Start a MINAP record

- Date and time of admission is the date and time of arrival with you. Enter time of arrival as 00:00. No other times are required.
- Admission method (new field) is 5. *Repatriation after coronary intervention*.
- Initial diagnosis is 1. *Definite myocardial infarction* (assuming that primary PCI was performed for STEMI). MINAP will ensure that there is no double counting of infarction provided Admission method is 5. *Repatriation after coronary intervention*.
- Complete the following
 - Interventional centre code from which patient came
 - Initial reperfusion treatment is 0. *None* as this applies to treatment in your hospital.
 - What procedure was performed at the interventional hospital
 - Bleeding complications, only if they occur within 24 h of any intervention.
 - Any other investigations performed or arranged by your hospital; echo etc.
 - Re-infarction
 - Secondary prevention medication
 - Discharge date
 - Discharge destination
 - Discharge diagnosis is 1. *Myocardial infarction (ST elevation infarction)*
 - Followed up by

Fields that can be ignored in a secondary transfer from interventional centre to non interventional hospital

2.03	ECG determining treatment
2.04	Where was aspirin/antiplatelet treatment given
2.05 et seq	Previous medical history and procedures
2.22	Admitting consultant
2.23	Place first ECG performed
2.24-2.27	Drugs on admission
2.28	Glucose
2.29-30	Height / weight
2.31	LVEF
2.32	Family history of CHD
3.11	Where was initial reperfusion treatment given
3.17	Admission ward
3.19	Peak troponin
3.20-3.38 and 3.43-3.44	Drugs in hospital (unless locally requested)

19.2 Patients transferred to an interventional centre for rescue PCI : instructions for the referring hospital

A coronary intervention performed for continuing symptoms following thrombolytic treatment performed less than 24 hours after onset of symptoms of STEMI is a rescue procedure, and should be recorded as such. Beyond 24 hours after onset this should be no longer regarded as a rescue procedure, and the angiography field (4.13) and associated times completed. See 19.3 below.

CCAD uses the NHS number to link patient episodes together, but as an additional identifier please ensure that the patient's date of birth and post code are attached to any documentation that accompanies the patient to the interventional centre. These will be used as part of the identification process linking any information transferred back to you. This is vital if you are notable to provide the NHS number. Data entry should include as a minimum:

DEMOGRAPHICS Complete.

ADMISSION DETAILS Complete.

REPERFUSION

Time of onset of symptoms, etc., should be recorded.

Additional reperfusion treatment is *2. Referred for rescue PCI elsewhere*

Where was initial reperfusion treatment given As appropriate.

Interventional centre code Essential information

DISCHARGE DETAILS

Discharge destination is *2. Other hospital*

Date of discharge is the date of transfer unless the patient is likely to return to you, in which case use Daycase transfer date.

19.3 Patients having angiography/intervention that is not part of the initial reperfusion treatment

These are two groups; STEMI who did not have primary PCI and who undergo routine early angiography / intervention, and other non STE elevation ACS who require angiography and intervention.

For STEMI further intervention is often performed on a semi-urgent basis within 12-24 h of admission. If the procedure is done for continuing symptoms within 24 h of admission record this as a rescue procedure, and do not use the angiography or intervention fields. Rescue procedures should have a MINAP record completed at the interventional centre.

If this is an early semi-urgent procedure following STEMI in a patient without continuing symptoms, use the angiography and intervention fields. Transferred patients with STEMI do not need a new MINAP record at the interventional centre. For non ST elevation ACS use the angiography and intervention fields.

19.3.1 Patients having angiography on site

A patient having angiography where there are facilities for intervention on site. Enter details of Referral date for further investigation/intervention

Coronary angiography at this admission Use options 1. or 2. depending on indication.

Was the patient transferred for investigation is No

Local angio date/time This field can now receive a time element

Local intervention date

Discharge destination

Date of discharge

19.3.2 Patients having angio on site followed by transfer elsewhere for intervention

Referral date for original angio

Local angio date/time

Coronary angiography

Coronary intervention is *9. Unknown*

Day case transfer or Discharge date

Discharge destination is *2. Other hospital*

Interventional centre code

19.3.3. Patients transferred for daycase intervention

as above except

Transfer date for daycase investigation/intervention. The patient would be normally expected to return within 24 hours.

Was the patient transferred for investigation = Yes (Daycase)

Interventional centre code must be entered.

Discharge date Do not complete until patient leaves your hospital at the end of the episode.

Discharge destination Do not complete until patient leaves your hospital at the end of the episode.

19.3.4 Patients referred elsewhere for both angiography and any subsequent intervention

Referral date for further investigation/procedure

Coronary angiography Use options 3. or 4. depending on indication

Was the patient transferred for investigation = Yes (Transferred)

Local angio date/time Do not enter this date as procedure will be performed in another hospital

Interventional centre code Essential.

Discharge destination is *2. Other hospital*.

Discharge date.

20 Examples of data collection in non interventional hospitals

For all patients data should be entered in DEMOGRAPHICS, EXAMINATIONS, TESTS, PREVIOUS MEDICAL HISTORY, THERAPY, COMPLICATIONS AND DISCHARGE EDDETAILS.

20.1 Patient dials 999, ambulance ECG shows STEMI. Patient receives thrombolytic treatment in A&E, is referred for angiography/intervention and is discharged home from the interventional centre. This was a 'routine' post lysis angio with no continuing symptoms.

ADMISSION DETAILS

Initial diagnosis = 1. *Definite myocardial infarction*
Admission date/time
Admission method = 1. *Direct admission via emergency service*
Date/time of onset of symptoms/call for help
Ambulance job number

REPERFUSION

Complete all fields including:

Initial reperfusion treatment = 1. *Thrombolytic treatment*
Where was initial reperfusion treatment given = 2. *In A&E*
ECG determining treatment (to confirm ECG appearances of definite AMI)
Thrombolytic drug
Date/time of reperfusion
Additional reperfusion treatment as appropriate
Patient location at time of STEMI = 1. *Onset of STEMI while patient not in hospital (STE on first ECG)*
Site of infarction

INVESTIGATIONS/INTERVENTIONS

Date of referral for investigation/intervention
Coronary angiography = 3 or 4 *depending on indication*
Coronary intervention may be unknown
Interventional centre code

DISCHARGE DETAILS

Discharge date = Date of transfer to interventional centre
Discharge destination = 2. *Other hospital*
Discharge diagnosis = 1. *Myocardial infarction (ST elevation)*
Secondary prevention = 4. *Not applicable* (Interventional centre is responsible for secondary prevention)

20.2 ST elevation on ambulance ECG, thrombolytic treatment given by paramedic. Patient has angiography on site and transferred to intervention centre for intervention, from where they are discharged home.

ADMISSION DETAILS

As for previous example

Admission method = 1. *Direct admission via emergency service*

REPERFUSION

Initial reperfusion treatment = 1. *Thrombolytic treatment*
Where was initial reperfusion treatment given = 1. *Before admission to hospital*
Additional reperfusion treatment as appropriate
ECG determining treatment (to confirm ECG appearances of definite AMI)
And complete as for 20.1
Patient location at time of STEMI = 1. *Onset of STEMI while patient not in hospital (STE on first ECG)*

INVESTIGATIONS/INTERVENTIONS

Coronary angiography = *Options 1 or 2* depending on indication
Local angio date/time Note that time should now be recorded
Date of referral for intervention
Coronary intervention may be unknown
Interventional centre code

DISCHARGE DETAILS

Discharge date = Date of transfer to interventional centre
Discharge destination = 2. *Other hospital*

Discharge diagnosis = 1. Myocardial infarction (ST elevation)
Secondary prevention = 4. Not applicable

20.3 Ambulance ECG not diagnostic of ST elevation infarction but definite myocardial infarction diagnosed on arrival in A&E and patient given thrombolytic treatment.

ADMISSION DETAILS

Initial diagnosis = 1. Definite myocardial infarction
Admission method = 1. Direct admission via emergency service

REPERFUSION

Initial reperfusion treatment = 1. Thrombolytic treatment
Where was initial reperfusion treatment given
ECG determining treatment (to confirm ECG appearances of definite AMI)
Thrombolytic drug
Date/time of reperfusion
Additional reperfusion treatment as appropriate
Patient location at time of STEMI = 1. Onset of STEMI while patient not in hospital (STE on first ECG)

20.4 Patient self presents with typical history of cardiac pain with abnormal ECG on admission. Subsequent ECG shows typical acute ST elevation and patient given thrombolytic treatment.

As for definite MI (see 20.1) with the following variations

ADMISSION DETAILS

Initial diagnosis = 3. Acute coronary syndrome
Admission method = 2. Self presenter to this hospital

REPERFUSION

Initial reperfusion treatment = 1. Thrombolytic treatment
You may have already entered 0. None because you did not think it was appropriate at the time. You should go back and change this.
Delay before treatment = 4. Initial ECG ineligible
Date/time of reperfusion
Additional reperfusion treatment as appropriate
Patient location at time of STEMI = 2. STE first recorded on a subsequent ECG in, (or before arrival at) a non interventional hospital

20.5 Patient is already in hospital with infection and complains of chest pain, ECG shows STEMI but is not recognised as such. The true diagnosis is established more than 12 hours after onset of symptoms.

ADMISSION DETAILS

Initial diagnosis = 5. Other initial diagnosis
Admission method = 3. Already in this hospital

REPERFUSION

Initial reperfusion treatment = 0. None
Reason reperfusion treatment not given = 5. Administrative failure
ECG determining treatment to confirm ECG appearances of definite AMI
If the incorrect diagnosis is noted in time to offer thrombolytic treatment, enter as follows;
Initial reperfusion treatment = 1. Thrombolytic treatment
Date/time of reperfusion
Was there a delay before treatment = 7. Hospital administrative failure
Additional reperfusion treatment as appropriate

DISCHARGE DETAILS

Discharge diagnosis = 1. Myocardial infarction (ST elevation)

20.6 Patient admitted via ambulance service with typical history of cardiac pain and ECG showing extensive deep ST depression and elevated troponin. Patient is transferred to interventional centre for angiography/intervention and discharged home from there.

ADMISSION DETAILS

Initial diagnosis = 3. *Acute coronary syndrome*

Admission method = 1. *Direct admission via emergency service*

REPERFUSION

EEG determining treatment

TESTS

Cardiac markers raised

INVESTIGATIONS

Coronary angiography = 3. *Protocol driven investigation performed at another hospital or 4. Symptom driven investigation performed at another hospital depending on indication*

Coronary intervention = 9. *Unknown*

Date of referral for investigation

Date of transfer for investigation/intervention

Interventional centre code

DISCHARGE DETAILS

Discharge diagnosis = 4. *ACS troponin positive/nSTEMI*

Discharge destination = 2. *Other hospital*

Secondary prevention medication = 4. *Not applicable*

20.7 ST elevation on ambulance ECG, thrombolysed by paramedic, admitted to non interventional hospital, transferred to interventional centre for rescue for continuing symptoms and repatriated to your hospital.

ADMISSION DETAILS

Admission method = 1. *Direct admission via emergency service*

Initial reperfusion treatment = 1. *Thrombolytic treatment*

Where was initial reperfusion treatment given = 1. *Before admission to hospital*

What procedure performed at interventional centre = 3. *Rescue angioplasty [information available after return to you after rescue procedure]*

REPERFUSION

Initial reperfusion treatment = 1. *Thrombolytic treatment*

Where was initial reperfusion treatment given = 1. *Before admission to hospital*

Additional reperfusion treatment = 2. *Referred for rescue PCI elsewhere*

ECG determining treatment (to confirm ECG appearances of definite AMI)

Patient location at time of STEMI = 1. *Onset of STEMI while patient not in hospital (STE on first ECG)*

Thrombolytic drug

Date/time of reperfusion

INVESTIGATIONS

Interventional centre code

Date of return to referring hospital = Date patient returned to your hospital

[Note that details of referral for angiography are not required for rescue procedures]

DISCHARGE DETAILS

Secondary prevention medication

Discharge destination = 1. *Home*

If the patient is instead discharged home from the interventional centre, the interventional centre is responsible for secondary prevention medication.

Discharge destination = 2. *Other hospital*

Secondary prevention medication = 4. *Not applicable*

[Procedure performed at interventional centre is left blank]

20.8 No ambulance ECG performed, patient admitted to non interventional hospital where first hospital ECG shows ST elevation. Patient transferred to interventional centre for primary PCI and repatriated to your hospital.

ADMISSION DETAILS

Initial diagnosis = 1. *Definite myocardial infarction*

Admission date/time

Admission method = 1. *Direct admission via emergency service*

Date/time of onset of symptoms/call for help

Ambulance job number

What procedure performed at interventional centre = 2. *Primary angioplasty*

REPERFUSION

Initial reperfusion treatment = 3. *Referred for consideration for pPCI*

ECG determining treatment (to confirm ECG appearances of definite AMI)

Patient location at time of STEMI = 1. *Onset of STEMI while patient not in hospital (STE on first ECG)*

INVESTIGATIONS/INTERVENTIONS

Interventional centre code

Date of return to referring hospital = Date patient returned to your hospital

DISCHARGE DETAILS

Discharge diagnosis = 1. *Myocardial infarction (ST elevation)*

Secondary prevention medication

Discharge destination = 1. *Home*

20.9 The patient comes to a non interventional hospital for the first time after having primary PCI.

This should also be used where the patient has a pit stop at the non interventional hospital (not admitted) and is transferred on to the interventional centre. The interventional centre will make the main MINAP record and so the non interventional hospital record should be a skeleton record.

ADMISSION DETAILS

Initial diagnosis = 1. *Definite myocardial infarction*

Admission date/time Date is date of arrival at your hospital, enter 00.00 as the time

Admission method = 5. *Repatriation after coronary intervention*

What procedure performed at interventional centre = 2. *Primary angioplasty*

REPERFUSION

Initial reperfusion treatment = 0. *None* as none performed at your hospital

INVESTIGATIONS/INTERVENTIONS

Interventional centre code

DISCHARGE DETAILS

Discharge diagnosis = 1. *Myocardial infarction (ST elevation)*

Secondary prevention medication

Discharge destination = 1. *Home*

21 Examples of data collection in interventional centres

21.1 STEMI identified on ambulance ECG, taken directly to an interventional centre cath lab where primary PCI performed and patient discharged home.

ADMISSION DETAILS

Initial diagnosis = 1. *Definite myocardial infarction*
Admission date/time
Admission method = 1. *Direct admission via emergency service*
Date/time of call for help
Ambulance job number

REPERFUSION

Initial reperfusion treatment = 2. *Primary PCI in house*
ECG determining treatment (to confirm ECG appearances of definite AMI)
Date/time of reperfusion
Patient location at time of STEMI = 1. *Onset of STEMI while patient not in hospital (STE on first ECG)*

INTERVENTIONAL AUDIT

Assessment at non interventional hospital = 0. *No contact at non interventional hospital*
Assessment at interventional centre = 4. *Catheter laboratory*
Intended reperfusion procedure = 1. *Primary PCI*
Procedure performed = 3. *Angiogram and PCI*
Why no angiogram performed = 0. *Not applicable as angio performed*
Why no intervention performed = 0. *Not applicable as primary PCI performed*

DISCHARGE DETAILS

Discharge date
Discharge diagnosis = 1. *Myocardial infarction (ST elevation)*
Discharge destination = 1. *Home*
Secondary prevention

If patient is discharged to another hospital

Discharge destination = 2. *Other hospital*
Secondary prevention medication = 4. *Not applicable*

21.2 Paramedics misdiagnose STEMI on ambulance ECG, patient taken directly to an interventional centre cath lab where diagnosis of pericarditis is made. Angiography and primary PCI are not performed.

ADMISSION DETAILS

Initial diagnosis = 5. *Other initial diagnosis*
Admission date/time
Admission method = 1. *Direct admission via emergency service*
Date/time of call for help
Ambulance job number

REPERFUSION

Initial reperfusion treatment = 0. *None*
ECG determining treatment = 5. *Other abnormality*
Patient location at time of STEMI = 8. *Not applicable*
Additional reperfusion treatment = 0. *None*

INTERVENTIONAL AUDIT

Assessment at non interventional hospital = 0. *No contact at non interventional hospital*
Assessment at interventional centre = 4. *Catheter laboratory*
Intended reperfusion procedure = 0. *None*
Procedure performed = 1. *No angiogram*
Why no angiogram performed = 1. *Diagnosis not ACS*
Why no intervention performed can be left blank as this is clear from above responses.

DISCHARGE DETAILS

Discharge date
Discharge diagnosis = 8. *Other diagnosis*
Discharge destination = 1. *Home*

21.3 Patient develops ST elevation some time after admission to a non interventional hospital acute assessment unit, is then transferred to interventional centre where primary PCI performed and discharged home.

ADMISSION DETAILS

Initial diagnosis = 1. *Myocardial infarction (ST elevation)* in your hospital
Admission date/time at interventional centre
Admission method = 4. *Interhospital transfer for specific treatment*
Date/time of call for help

REPERFUSION

Initial reperfusion treatment = 2. *Primary PCI in house*
ECG determining treatment (to confirm ECG appearances of definite AMI)
Date/time of reperfusion
Patient location at time of STEMI = 2. *STE recorded on a subsequent ECG in (or before arrival at) a non interventional hospital*
Additional reperfusion treatment = 0. *None*

INTERVENTIONAL AUDIT

Date/time of arrival at non interventional hospital
Assessment a non interventional hospital = 3. *Acute assessment unit*
Assessment at interventional centre as appropriate
Intended reperfusion procedure = 1. *Primary PCI*
Procedure performed = 3. *Angiogram and PCI*
Why no angiogram performed = 0. *Not applicable* as angio performed
Why no intervention performed = 0. *Not applicable* as primary PCI performed

INVESTIGATIONS/INTERVENTIONS

Referring hospital code

DISCHARGE DETAILS

Discharge date
Discharge diagnosis = 1. *Myocardial infarction (ST elevation)*
Discharge destination = 1. *Home*
Secondary prevention

If patient is discharged to another hospital

Discharge destination = 2. *Other hospital*
Secondary prevention medication = 4. *Not applicable*

21.4 Patient self presents at non interventional hospital with STEMI. Patient not admitted, but is transferred to interventional centre cath lab where primary PCI performed, discharged back to non interventional hospital.

ADMISSION DETAILS

Initial diagnosis = 1. *Definite myocardial infarction*
Admission date/time at interventional centre
Admission method = 1. *Direct admission via emergency service*
Date/time of call for help (obtained from non interventional hospital)
Ambulance job number not required

REPERFUSION

Initial reperfusion treatment = 2. *Primary PCI in house*
ECG determining treatment (to confirm ECG appearances of definite AMI)
Date/time of reperfusion
Patient location at time of STEMI = 1. *Onset of STEMI while patient not in hospital (STE on first ECG)*
Additional reperfusion treatment = 0. *None*

INTERVENTIONAL AUDIT

Date/time of arrival at non interventional hospital = Date/time of registration in non interventional centre A&E
Assessment at non interventional hospital = 5. *Self referral*
Assessment at interventional centre = 4. *Catheter laboratory*
Intended reperfusion procedure = 1. *Primary PCI*
Procedure performed = 3. *Angiogram and PCI*
Why no angiogram performed = 0. *Not applicable* as angio performed

Why no intervention performed = 0. Not applicable as primary PCI performed

INVESTIGATIONS/INTERVENTIONS

Referring hospital code

DISCHARGE DETAILS

Discharge date

Discharge diagnosis = 1. Myocardial infarction (ST elevation)

Discharge destination = 2. Other hospital

Secondary prevention = 4. Not applicable

21.5 Patient taken directly by ambulance to interventional hospital A&E where initial ECG does not show STEMI. Subsequent ECG shows STEMI, primary PCI is performed and patient discharged back to local non interventional hospital.

ADMISSION DETAILS

Initial diagnosis = 3. Acute coronary syndrome

Admission date/time

Admission method = 1. Direct admission via emergency service

Date/time of call for help

Ambulance job number

REPERFUSION

Initial reperfusion treatment = 2. Primary PCI in house

ECG determining treatment (to confirm ECG appearances of definite AMI)

Date/time of reperfusion

Patient location at time of STEMI = 3. STEMI recorded in subsequent ECG in, (or before arrival at) the interventional hospital

Additional reperfusion treatment = 0. None

INTERVENTIONAL AUDIT

Assessment at non interventional hospital = 0. No contact at non interventional hospital

Assessment at interventional centre = 1. Assessed in A&E

Intended reperfusion procedure = 1. Primary PCI

Procedure performed = 3. Angiogram and PCI

Why no angiogram performed = 0. Not applicable as angio performed

Why no intervention performed = 0. Not applicable as primary PCI performed

DISCHARGE DETAILS

Discharge date

Discharge diagnosis = 1. Myocardial infarction (ST elevation)

Discharge destination = 2. Other hospital

Secondary prevention = 4. Not applicable

21.6 Paramedics diagnose STEMI and give pre-hospital thrombolysis, patient is taken to non interventional hospital A&E but transferred immediately to interventional centre for continuing ST elevation where rescue PCI performed. Patient repatriated to non interventional hospital.

ADMISSION DETAILS

Initial diagnosis = 1. Definite myocardial infarction

Admission date/time at interventional centre

Method of admission = 1. Direct admission via emergency service

Ambulance job number of ambulance trust that performed pre-hospital lysis

Date/time of call for help

REPERFUSION

Initial reperfusion treatment = 1. Thrombolytic treatment to document that pre-hospital thrombolysis was given

Patient location at time of STEMI = 1. Onset of STEMI while patient not in hospital (STE on first ECG)

ECG determining treatment (to confirm ECG appearances of definite AMI)

Where was initial reperfusion treatment given = 1. Before admission to hospital

Delay before treatment from ambulance PRF

Site of infarction

Date/time of reperfusion from ambulance PRF

Additional reperfusion treatment = 1. Rescue PCI in house

INTERVENTIONAL AUDIT

Date/time arrival at non-interventional hospital from ambulance PRF
Assessment at non-interventional hospital = 2. A&E
Assessment at interventional centre = 4. Catheter laboratory
Intended reperfusion procedure = 2. Rescue PCI
Procedure performed = 3. Angio and PCI
Why no angiogram performed = 0. Not applicable
Why no intervention performed = 0. Not applicable

INVESTIGATIONS/INTERVENTIONS

Referring hospital code

DISCHARGE DETAILS

Discharge date
Discharge diagnosis = 1. Myocardial infarction (ST elevation)
Discharge destination = 2. Other hospital
Secondary prevention medication = 4. Not applicable

21.7 Patient self presents with ST elevation on first ECG in non interventional hospital A&E where unsuccessful thrombolytic treatment is given. Patient is transferred to interventional centre cath lab where rescue PCI performed. Patient repatriated to non interventional hospital.

ADMISSION DETAILS

Initial diagnosis = 1. Definite myocardial infarction
Admission date/time at interventional centre
Method of admission = 4. Interhospital transfer for specific treatment
Ambulance job number of ambulance performing transfer not required
Date/time of call for help = Date/time of registration in non interventional centre A&E

REPERFUSION

Initial reperfusion treatment = 0. None (performed in your hospital)
Patient location at time of STEMI = 1. Onset of STEMI while patient not in hospital (STE on first ECG)
ECG determining treatment (to confirm ECG appearances of definite AMI)
Additional reperfusion treatment = 1. Rescue PCI in house

INTERVENTIONAL AUDIT

Date/time arrival at non-interventional hospital = Date/time of registration in non interventional centre A&E
Assessment at non-interventional hospital = 2. A&E
Assessment at interventional centre = 4. Catheter laboratory
Intended reperfusion procedure = 2. Rescue PCI
Procedure performed = 3. Angio and PCI
Why no angiogram performed = 0. Not applicable
Why no intervention performed = 0. Not applicable

INVESTIGATIONS/INTERVENTIONS

Referring hospital code

DISCHARGE DETAILS

Discharge date
Discharge diagnosis = 1. Myocardial infarction (ST elevation)
Discharge destination = 2. Other hospital
Secondary prevention medication = 4. Not applicable

Appendix 1 Data completeness fields 2011/12

CDS No	CDS Field Name
1.03	NHS number
1.10	Patient post code
1.11	GP / PCT code
2.03	ECG determining treatment
2.14	Cardiac markers raised
2.16	Smoking status
2.17	Diabetes
2.26	Statin use (prior to admission)
2.28	Serum glucose
2.39	Admission method
3.06	Date/time of arrival at hospital
3.22	Thienopyridine platelet inhibitor (in hospital use)
4.01	Discharge date
4.02	Discharge diagnosis
4.03	Bleeding complications
4.04	Death in hospital
4.06	Discharged on ACEI or ARB
4.13	Coronary angiography
4.16	Discharge destination
4.27	Discharged on thienopyridine inhibitor

The same fields are used for data completeness and data validation with the exception that Initial diagnosis replaces Serum glucose in the data validation study as Serum glucose is a numeric field and Patient ethnicity replaces GP/PCT code. The records are selected with a Discharge diagnosis of 4. Acute coronary syndrome (troponin positive).

Appendix 2 Mandatory fields for STEMI and other ACS

Fields have been classified into

- **M** = mandatory
- Y = MINAP would expect this item to be completed to give a useful overview of care
- L = for local use if wanted. If you use these fields it is to your advantage to be consistent about collection
- NA = not applicable

The diagnoses of STE MI and all other ACS are based on final diagnoses which should be apparent within the first 24 hours after admission.

- DC = Fields required for online data completeness view
- DV = Fields required for this year's data validation study

	Field	STE MI	Other ACS	Comment	DC	DV
1.03	NHS number	M	M		*	*
1.06	DOB	M	M			
1.07	Gender	M	M			
1.10	Postcode	M	M		*	*
1.11	GP/PCT code				*	
1.13	Patient ethnicity	Y	Y			*
2.01	Initial diagnosis	M	M			
2.03	ECG determining treatment	M	M		*	*
2.04	Where was aspirin...	Y	Y			
2.05 – 2.13. Previous history		Y	Y	Important to determine co-morbidity in relation to outcome, nationally and locally		
2.14	Cardiac markers raised	Y	Y		*	*
2.15	Cholesterol	Y	Y			
2.16	Smoking status	Y	Y		*	*
2.17	Diabetes	Y	Y		*	*
2.18	Previous PCI	Y	Y			
2.19	Previous CABG	Y	Y			
2.20	Systolic BP	Y	Y	Together with pulse and age this is a very powerful predictor of 30 day mortality for AMI. Used for predictive scoring		
2.21	Pulse rate	Y	Y			
2.22	Admitting consultant	Y	Y			
2.23	Place first ECG performed	Y	Y	Needed by ambulance service		
2.24 – 2.27 Previous drug use		Y	Y			
2.26	Previous drug use – Statin	Y	Y		*	*
2.28	Glucose	Y	Y	Very powerful determinant of subsequent morbidity for diabetics and non diabetics	*	*
2.29	Height	Y	Y	Important in assessment of obesity		
2.30	Weight	Y	Y	Low body weight is a predictor of bleeding with lytics		
2.31	Ejection fraction	Y	Y	Even if EF is not measured, this fact should be recorded		
2.32	FH of CHD	L	L			
2.33	Cardiological care during admission	Y	Y	Recorded in Annual Report		
2.34	Creatinine	Y	Y	A determinant of mortality		
2.35	Haemoglobin	Y	Y	A determinant of mortality		
2.36	Site of infarction	Y	NA			
2.37	ECG QRS duration	Y	Y	NICE secondary prevention data		
2.38	Thienopyridine inhibitor use	Y	Y			
2.39	Admission method	M	Y	Needed for analysis to identify inter-hospital transfers and	*	*

				repatriation		
2.40	Patient location at time of STEMI	Y		Needed for analysis		
2.41	Killip class on admission	Y	Y	Needed for analysis		
3.01	D/T of symptom onset	M	L	Needed for analysis		
3.02	D/T of call for help	M	L	Needed for analysis		
3.03	D/T of first responder	L	L			
3.04	D/T of ambulance arrival	L	L			
3.05	Ambulance job number	M	M	Essential to link with the ambulance outcomes database		
3.06	D/T arrival in hospital	M	M	Needed for analysis. In MINAP a record cannot be started without this information	*	
	Field	STE MI	Other ACS	Comment	DC	DV
3.08	Reason reperfusion not given	M	NA	Needed for analysis		
3.09	D/T of reperfusion treatment	M	NA	Needed for analysis		
3.10	Delay before treatment	M	NA	Needed for analysis		
3.11	Where was initial reperfusion given	M	NA	Needed for analysis		
3.14 – 3.16	Cardiac arrest	Y	Y			
3.17	Admission ward	Y	Y	Recorded in Public report		*
3.18	Peak CK	Y	Y	All patients should have either a peak CK or peak troponin recorded		
3.19	Peak troponin	M	M			
3.20 – 3.35 and 3.38	Drugs used in hospital	L	L	For local decision, but see 3.24 for all agents; either use these consistently in your hospital or not at all.		
3.22	Thienopyridene platelet inhibitor	L	L		*	*
3.24	2b/3a inhibitor	Y	Y	Given cost and existence of NICE guidance should be collected		
3.36	Thrombolytic drug	Y	NA			
3.37	Troponin assay	Y	Y			
3.39	Initial reperfusion treatment	M	NA			
3.40	Additional reperfusion treatment	M	NA			
3.41	Inpatient management of hyperglycaemia	Y	Y			
3.42	Diabetic therapy at disch	Y	Y			
3.43	Oral beta blocker	L	L	Refers to in hospital use		
3.44	Aldosterone antagonist	L	L	Refers to in hospital use		
3.46	Date / time of arrival at non interventional hospital	M	NA	For collection in interventional hospital only		
3.47	Assessment at non interventional hospital	M	NA	For collection in interventional hospital only		
3.48	Assessment at interventional centre	M	NA	For collection in interventional hospital only		
3.49	Intended reperfusion procedure	M	NA	For collection in interventional hospital only		
3.50	Procedure performed	M	NA	For collection in interventional hospital only		
3.51	Why no angiogram performed	M	NA	For collection in interventional hospital only		
3.52	Why no intervention performed	M	NA			
4.01	Date of discharge	M	M		*	*
4.02	Discharge diagnosis	M	M		*	*

4.03	Bleeding complication	Y	Y		*	*
4.04	Death in hospital	M	M	Essential for secondary prevention analysis	*	*
4.05 – 4.08 and 4.25; secondary prevention medication		M	M			
4.06	Discharged on ACEI/ARB				*	*
4.09	Cardiac rehab	Y	Y			
4.10	Exercise test	L	L			
4.11	Echo	L	L			
4.12	Radionucleide study	L	L			
4.13	Coronary angio	M	M		*	*
4.14	Coronary intervention	M/Y	Y	Mandatory for interventional centres		
	Field	STE MI	Other ACS	Comment	DC	DV
4.15	Date of referral for angio / intervention	M	M	Essential for hospital transfer delays		
4.16	Discharge destination	M	M		*	*
4.17	Daycase transfer date	M	M	Not all required in every case		
4.18	Local angio date/time	M	M			
4.19	Local intervention date	M	M	Likely to be same as 4.18		
4.20	Referral centre	M	M	4.21 Refers to the hospital from which the patient came. All are very important in order to track referrals.		
4.21	Referring hospital	M	M			
4.23	Followed up by	Y	Y			
4.24	Reinfarction	Y	Y			
4.26	Date of return to referring hospital			For use when a patient is repatriated following primary PCI / rescue		
4.27	Discharged on thienopyridine inhibitor	M	M		*	*
4.28	Discharged on aldosterone antagonist	M	M			
4.28	What procedure was performed at the interventional hospital	Y	Y			
5.01	Smoking cessation advice	Y	Y			
5.02	Dietary advice	Y	Y			

Appendix 3

MINAP Dataset Version 9.1, December 2010

CCAD Seq	Field Prompt	Short Code	Text for long code	Definition and notes	Format	E
1.01	Hospital identifier			The identifier allocated to the hospital by CCAD. Valid hospital identifiers are listed in a separate file.	Code a3	N
1.02	Patient case record number			Hospital number is required for identification if the NHS number is not known.	Id an10	Y
1.03	NHS number			Unique national identifier that will be used for event and mortality tracking. This will be encrypted before data transfer. Any other event or procedure recorded by CCAD will be linked using the NHS number.	Id n10	Y
1.04	Patient surname				an35	Y
1.05	Patient forename				an35	Y
1.06	Patient date of birth			Valid date>1880 and <=Today.	Date	Y
1.07	Patient gender				Code n1	N
		0	Not known			
		1	Male			
		2	Female			
	9	Not specified				
1.09	Patient admin status				Code n1	N
		1	NHS	NHS patient, including overseas visitors charged under Section 121 of the NHS Act 1977 as amended by Section 7(12) and (14) of the Health and Medicine Act 1988.		
		2	Private	A private patient is any patient whose care is not funded by the NHS, wherever that care is delivered.		
		3	Amenity	Amenity patient, one who pays for the use of a single room or small ward in accord with section 12 of the NHS Act 1977, as amended by section 7(12) and (14) of the Health and Medicine Act 1988.		
	9	Unknown				
1.10	Patient postcode			The postcode of the address nominated by the patient as their main permanent residence. Use pseudo postcodes for visitors.	Id an8	Y
1.11	GP/ PCT code			The national code for the practice of the patient's registered GP or PCT.	Code 6	Y
1.13	Patient ethnicity			The patient's ethnic group as perceived by the patient.	Code n2	N
		1	White	Includes British, Irish, any other White background.		
		2	Black	Includes Caribbean, African, Black British, any other Black background.		
		3	Asian	Includes Indian, Pakistani, Bangladeshi, Asian British, any other Asian background.		
		5	Mixed	Includes White and Black Caribbean, White and Black African, White and Asian, any other mixed background.		
		6	Not stated	Where the patient cannot or does not wish to state his/her ethnic background.		
		8	Other	Includes Chinese, any other ethnic group.		
	9	Unknown				

2.01	Initial diagnosis			This is a working diagnosis whose primary purpose is to identify those patients with a diagnosis of definite ST elevation MI. This includes an initial diagnosis made by an ambulance paramedic crew, or other clinician in a position to provide definitive treatment. Do not change Initial diagnosis on the basis of further ECGs or enzymes/markers. (See 2.03 ECG determining treatment).	Code n1	N
		1	Definite myocardial infarction	Diagnosis based on unequivocal changes of infarction on initial ECG (ST elevation or new LBBB) and appropriate history and are thus eligible for consideration for reperfusion treatment. LBBB of uncertain duration should be recorded as Acute coronary syndrome.		
		3	Acute coronary syndrome	Covers all other suspected acute coronary syndromes including cases previously categorised as 2. Probable infarction. Confirmation of diagnosis awaits results of troponin assay. Should be used where there is a strong likelihood of infarction on history and an abnormal ECG without significant ST elevation or new LBBB without ST segment elevation.		
		4	Chest pain ? cause	Single episode of chest pain thought to be cardiac in nature where admission was thought appropriate to exclude an ischaemic event. 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.		
		5	Other initial diagnosis	Other (usually non-cardiac) diagnosis such as acute aortic dissection, pancreatitis, etc where symptoms are subsequently found to be a manifestation of acute cardiac ischaemia. Use where patient is already in hospital.		
2.03	ECG determining treatment			The ECG appearances upon which a decision to offer reperfusion treatment including primary PCI, was based. This can include any 12 lead ECG performed in the pre-hospital setting. If ST elevation consistent with infarction is recorded on any ECG during the admission, regardless of treatment, the discharge diagnosis should be Myocardial infarction (ST elevation).	Code n1	N
		0	No acute changes	ECG is normal or unchanged from one recorded before this admission.		
		1	ST segment elevation	Appearances considered typical of acute ST elevation myocardial infarction.		
		2	Left bundle branch block	New LBBB. Whether or not LBBB is 'new' causes practical difficulties. In order to confirm this it is necessary to have evidence that it did not exist before this event, by comparing with previous ECGs. Unless there is definite ST segment elevation in addition to LBBB, the admission diagnosis for a patient with LBBB of uncertain duration has to be Acute coronary syndrome.		
		3	ST segment depression	Any degree of ST segment depression involving more than one lead without any ST elevation (except aVR).		
		4	T wave changes only	Includes non Q wave infarction.		
		5	Other acute abnormality	Other ECG abnormality related to this acute event.		
		9	Unknown			
2.04	Where was aspirin/other antiplatelet given?			Identifies if and when aspirin or other antiplatelet drug was first given to patient.	Code n1	N
		1	Already on aspirin / antiplatelet drug	Regular use of aspirin/antiplatelet before this episode. Ignore the administration of additional doses by paramedics.		
		2	Aspirin / antiplatelet drug given out of hospital	Aspirin or other antiplatelet drug started for this episode before admission. Patient not previously taking any antiplatelet drug.		
		3	Aspirin / antiplatelet drug given after arrival in hospital			
		4	Aspirin / antiplatelet contraindicated			
		8	Not given			
9	Unknown					

2.05	Previous AMI			Any previously validated episode of acute myocardial infarction.	Code n1	N
		0	No			
		1	Yes			
		9	Unknown			
2.06	Previous angina			Symptoms due to cardiac ischaemia developing or already in existence at least two weeks prior to admission, and continuing up to admission.	Code n1	N
		0	No			
		1	Yes			
		9	Unknown			
2.07	Hypertension			A patient already receiving treatment (drug, dietary or lifestyle) for hypertension or with recorded BP > 140/90 on at least two occasions prior to admission.	Code n1	N
		0	No			
		1	Yes			
		9	Unknown			
2.08	Hypercholesterolaemia			Elevation of serum cholesterol requiring dietary or drug treatment. Use field 2.15 (Serum cholesterol) for present value of cholesterol.	Code n1	N
		0	No			
		1	Yes			
		9	Unknown			
2.09	Peripheral vascular disease			The presence of peripheral vascular disease, either presently symptomatic or previously treated by intervention or surgery. Include known renovascular disease and aortic aneurysm.	Code n1	N
		0	No			
		1	Yes			
		9	Unknown			
2.10	Cerebrovascular disease			A history of cerebrovascular ischaemia. To include transient cerebral ischaemic episodes as well as events with deficit lasting >24 hours.	Code n1	N
		0	No			
		1	Yes			
		9	Unknown			
2.11	Asthma or COPD			Any form of obstructive airways disease.	Code n1	N
		0	No			
		1	Yes			
		9	Unknown			
2.12	Chronic renal failure			Creatinine chronically >200 micromol/L.	Code n1	N
		0	No			
		1	Yes			
		9	Unknown			
2.13	Heart failure			A previously validated diagnosis of heart failure on any therapeutic regime.	Code n1	N
		0	No			
		1	Yes			
		9	Unknown			

2.14	Cardiac markers raised?			Identifies if cardiac biomarkers are raised during the acute phase of this admission. The local reference limit should be confirmed with your clinical chemistry department.	Code n1	N
		0	No	An absence of any rise in cardiac bio-markers (usually troponin) to a value above the 99th centile of the upper reference limit for the assay used.		
		1	Yes	A rise in cardiac bio-markers (usually troponin) with at least one value above the 99th centile of the upper reference limit for the assay used.		
		9	Unknown	If the patient dies before bloods are taken enter Unknown.		
2.15	Serum cholesterol			A sample taken within 24 hours of admission.	n2.1	N
2.16	Smoking status				Code n1	N
		0	Never smoked	Patient has never smoked.		
		1	Ex smoker	An ex smoker is one who has given up smoking more than one month previously.		
		2	Current smoker	A current smoker is a patient regularly smoking an average of 1 or more cigarettes per day, or equivalent. Any cigarettes smoked in the last month classify the patient as a current smoker.		
		3	Non smoker - smoking history unknown	Currently a non smoker but past history unknown.		
9	Unknown	Smoking status unknown.				
2.17	Diabetes				Code n1	N
		0	Not diabetic	Not known diabetic.		
		1	Diabetes (dietary control)	Diabetic not receiving insulin or oral medication.		
		2	Diabetes (oral medicine)	Diabetic receiving oral medication prior to admission.		
		3	Diabetes (insulin)	Diabetic receiving insulin without additional oral medication.		
		5	Insulin plus oral medication	Diabetic receiving insulin and oral medication prior to admission.		
9	Unknown					
2.18	Previous PCI			A percutaneous coronary intervention at any time prior to this admission.	Code n1	N
		0	No			
		1	Yes			
		9	Unknown			
2.19	Previous CABG			Coronary artery bypass grafting at any time prior to this admission.	Code n1	N
		0	No			
		1	Yes			
		9	Unknown			
2.20	Systolic BP			The first systolic blood pressure recorded after admission to hospital. The patient should be in a stable cardiac rhythm, ie sinus or chronic AF. Where the presenting rhythm is a treatable tachyarrhythmia, the first stable SBP after treatment should be used.	n3	N
2.21	Heart rate			The heart rate recorded from the first ECG after admission to hospital, whilst in a stable cardiac rhythm ie sinus rhythm, or chronic AF. In complete heart block record ventricular rate. Where the presenting rhythm is a treatable tachyarrhythmia, the first stable heart rate after treatment should be used.	n3	N
2.22	Admitting consultant			The clinician having primary care of the patient immediately (first 24 hours) after admission to hospital (not the A&E consultant).	Code n2	N
		0	Cardiologist	Cardiologist or physician with a major interest in cardiology.		
		1	Other general physician	All other physicians.		
		9	Other	Patient admitted under another discipline, e.g. surgeon.		
		99	Unknown			

2.23	Place first 12 lead ECG performed			This refers to the 1st ECG recorded, not necessarily the diagnostic ECG.	n1	N
		1	Ambulance	An ECG performed in any location by ambulance paramedic staff as a result of an emergency call.		
		2	In hospital	In this hospital.		
		3	Other healthcare facility	Includes general practice or care home where the ECG was performed by a non paramedic.		
	9	Unknown				
2.24	Beta blocker use			Any beta blocker in regular use prior to this admission.	n1	N
		0	No			
		1	Yes			
		9	Unknown			
2.25	ACEI or ARB use			Any angiotensin converting enzyme inhibitor or angiotensin receptor blocking agent in regular use prior to this admission.	n1	N
		0	No			
		1	Yes			
		9	Unknown			
2.26	Statin use			Any statin in regular use prior to this admission.	n1	N
		0	No			
		1	Yes			
		9	Unknown			
2.28	Serum glucose			Glucose taken on admission (not necessarily fasting).	n2.1	N
2.29	Height			Height in cms to derive BMI.	n3	N
2.30	Weight			Weight in kgs to derive BMI.	n3.1	N
2.31	Left ventricular ejection fraction			Left ventricular ejection fraction measured during this admission by echo, angio, radionuclide or MR study.	n1	N
		1	Good	>=50%		
		2	Moderate	30-49%		
		3	Poor	<30%		
		8	Not assessed			
9	Unknown					
2.32	Family history of CHD			Identifies a family history of premature CHD by diagnosis, (males before 55, females before 65).	n1	N
		0	No			
		1	Yes			
		9	Unknown			
2.33	Cardiological care during admission			Record if the patient was seen by a cardiologist (or member of clinical team working under the supervision of a cardiologist) during admission.	n1	N
		0	No			
		1	Yes			
		9	Unknown			
2.34	Creatinine			Recorded within 24 hours of admission, (micromol/L).	n 2	N
2.35	Haemoglobin			Recorded within 24 hours of admission, (g/dL).	n 2.1	
2.36	Site of infarction			Enter the area having the most extensive ST segment changes.	n1	N
		1	Anterior			
		2	Inferior			

		3	Posterior			
		4	Lateral			
		5	Indeterminate	Use in presence of very extensive changes.		
		9	Unknown			
2.37	ECG QRS complex duration			Must be stable feature on ECGs during admission. NICE MI secondary prevention audit criteria.	n1	N
		1	QRS complex duration >= 120 msec	Persistent not transient prolongation.		
		2	QRS complex duration <120 msec			
		9	Unknown			
2.38	Thienopyridine inhibitor use			Use of any thienopyridine inhibitor (includes Clopidogrel and Prasugrel) prior to this admission.	n1	N
		0	No			
		1	Yes			
		9	Unknown			
2.39	Admission method				n1	N
		1	Direct admission via emergency service	Implies arrival by ambulance, helicopter.		
		2	Self presenter to this hospital	Implies that the patient made their own way (public transport, brought by relative etc.,) to hospital. Includes those advised to do so by GP.		
		3	Already in this hospital	If the patient is already in hospital with another diagnosis it is only necessary to enter the date of symptom onset and the date of arrival at hospital. Use if patient is admitted from a Rapid Access Chest Pain Clinic.		
		4	Inter-hospital transfer for specific treatment	Specifically covers transfer to specialist centre for proposed treatment (other than 5).		
		5	Repatriation after coronary intervention	Return from interventional centre (usually after pPCI)		
		6	Other			
		9	Unknown			
2.40	Patient location at time of STEMI			The purpose of this field is to permit identification of STE MI not originating in the community, in order that such patients can be excluded, where appropriate, from call to needle and call to balloon analyses.	n1	N
		1	Onset of STEMI while patient not in hospital (STE on first ECG)	This implies that ST elevation was found on first ECG performed in an ambulance or other medical facility (GP surgery etc) before arrival at the first hospital or on the first ECG recorded in hospital for a self presenter. If no ECG was taken prior to admission and first ECG recorded in hospital shows ST elevation then it should be assumed that STEMI developed before reaching hospital. This option should also be selected where an ECG was not considered diagnostic before admission, but STE is diagnosed on arrival at A&E.		
		2	STE first recorded on a subsequent ECG in, (or before arrival at) a non-interventional hospital	The word subsequent applies to any ECG taken after an initial non-diagnostic ECG was performed at the non-interventional hospital. This group of patients will have arrived in hospital without a diagnosis of STE MI, and then develop ST segment elevation after hospital admission. The subsequent ECG may be at any time after admission to hospital. This option covers a spectrum from patients initially presenting with features consistent with ACS who go on to develop STEMI through to patients who are admitted for some other condition who develop STEMI while in hospital.		
		3	STE first recorded on a subsequent ECG in, (or before arrival at) the interventional hospital	The word subsequent applies to any ECG taken after an initial non-diagnostic ECG was performed at the interventional hospital. This group of patients will have arrived in hospital without a diagnosis of STE MI, and then develop ST segment elevation after hospital admission. The subsequent ECG may be at any time after admission to hospital. This option covers a spectrum from patients initially presenting with features consistent with ACS who go on to develop STEMI through to patients who are admitted for some other condition who develop STEMI while in hospital.		

		8	Not applicable			
		9	Unknown			
2.41	Killip class			A part of the GRACE score. The worst category developing during the admission should be used.	n1	N
		1	No evidence of heart failure			
		2	Basal crepitations and/or elevated venous pressure			
		3	Pulmonary oedema	Extensive lung crepitations consistent with pulmonary oedema, or confirmatory X ray evidence.		
		4	Cardiogenic shock	Hypotension, poor tissue perfusion and oliguria due to ventricular dysfunction in the presence of raised filling pressures.		
		8	Not applicable	Where patient dies or is transferred early in the event.		
		9	Unknown			
3.01	Date/time of symptom onset			Valid date>1/1/2000 and <=Today. 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.	DateTime	N
3.02	Date/time of call for help			Valid date>1/1/2000 and <=Today. The time of the initial call by patient, relative or attendant. This may be to a GP, NHS Direct, or the ambulance service. If 999 call use call connect time, the time the emergency call is connected to local ambulance control. The call connect time should be taken from the ambulance CAD form. 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.	DateTime	N
3.03	Date/time of arrival of first responder			Valid date>1/1/2000 and <=Today. Time of arrival of general practitioner or other first responder. Includes community first responder or paramedic in car.	DateTime	N
3.04	Date/time of arrival of ambulance			Valid date>1/1/2000 and <=Today. Arrival of ambulance capable of transporting patient. Should be available on the ambulance PRF form.	DateTime	N
3.05	Ambulance Job Number			This should be in the form of 3 letter ambulance trust code, followed by the by the CAD or Incident number (or the PRF number if the CAD number not available), followed by the date of admission in the format ddmmyyy, without any spaces.	Id an?	N
3.06	Date/time arrival at hospital			This field MUST be completed - all patients must have an admission date and time. This refers to your hospital. Please use the time recorded by the ambulance service, not the time of the first ECG, nor the time of registration in A&E. Use A&E registration time if patient self presented in A&E or time of ambulance arrival at hospital if a direct admission. Even if precise times are unknown, and the patient does not receive reperfusion treatment, you MUST enter the date of admission to hospital. Time of arrival in hospital is the time of arrival of the ambulance at the front door. For interventional centres is Date/time of arrival at interventional centre. Where transferred for primary PCI use 3.46 for date/time of arrival at non interventional hospital.	DateTime	N
3.08	Reason reperfusion treatment not given			Reperfusion treatment refers to primary PCI and thrombolytic treatment and applies only to patients with ST elevation infarction. Where there is more than one contraindication to treatment you can only enter one option, with 'Too late' having priority over all the others.	n2	N
		0	None	This is default value which should be changed to the appropriate option.		
		1	Ineligible ECG	No ECGs show unequivocal ST elevation or LBBB - NB: this choice is NOT compatible with an initial diagnosis of Definite MI because that diagnosis implies that the ECG must have been diagnostic of ST elevation infarction.		
		2	Too late	A decision made in light of a local protocol. It may be checked against other recorded delays where initial diagnosis is definite myocardial infarction.		
		3	Risk of haemorrhage	Includes risk of bleeding from all sites and after prolonged resuscitation.		

		4	Uncontrolled hypertension	An appropriate contraindication especially in older people.		
		5	Administrative failure	To be used where in the opinion of a senior clinician reperfusion treatment was withheld incorrectly.		
		6	Elective decision	To be used where a decision was made not to treat a patient (severe coexisting morbidity, or dying).		
		7	Patient refused treatment			
		8	Other	Use for any contraindication not covered by other options.		
		9	Unknown	Use when eligible patient fails to receive reperfusion treatment without a stated reason.		
3.09	Date/time of reperfusion treatment			The time of onset of lytic treatment, whether infusion or injection. The time the first device is used in coronary artery (balloon, stent or extraction catheter). It is not the time the angioplasty guidewire is first introduced, even if this restores flow.	DateTime	N
3.10	Delay before treatment			Delay before treatment can occur at any time from the moment of arrival of the ambulance crew. Where it is policy for prehospital treatment to be given, any of the reasons for delay can be used by the paramedic crew. Applies to all forms of reperfusion treatment.	Code n2	N
		0	No	There was no operational delay regardless of the time to treatment.		
		1	Sustained hypertension	As defined by local protocol.		
		2	Clinical concern about recent cerebrovascular event or surgery	Where delay results from need to check on significance of recent cerebrovascular event or operative procedure.		
		3	Delay obtaining consent	Where patient requests delay. Use only when the patient wishes to take time to consider treatment options.		
		4	Initial ECG ineligible	Where, after an initially ineligible ECG, reperfusion treatment is used after development of ST elevation. These patients are not included in DTN and CTN analyses.		
		5	Cardiac arrest	Cardiac arrest includes an arrest occurring before arrival in hospital.		
		6	Obtaining consent for therapeutic trial	Consent for a therapeutic trial. Use only for an approved study.		
		7	Hospital administrative failure	Includes any valid procedural reason why treatment was delayed in hospital.		
		8	Ambulance procedural delay	This includes any pre-hospital delay outside the control of the ambulance service, eg incorrect address, difficulty finding address, unable to gain entry to patient's house, patient reasons eg initial refusal to go to hospital or extended domestic arrangements, adverse weather conditions, stabilising the patient, crew had to wait for boat, helicopter delay, wait for police to gain entry, failure to cannulate.		
		9	Other	Use for any delay not covered by other options.		
		10	Ambulance 12 lead ECG not diagnostic of STEMI	When initial ambulance 12 lead ECG is non diagnostic of STEMI.		
		11	Consideration of primary PCI	Where consideration for primary PCI led to a delay in providing thrombolysis.		
		12	Ambulance administrative delay	When initial ambulance 12 lead ECG is diagnostic of STEMI but patient outwith local criteria for paramedic thrombolysis.		
		13	Cath lab access delayed			
		14	Delay in activating cath lab team			
		15	Pre-PCI complication	Includes cardiogenic shock and insertion of IABP and temporary pacing.		
		16	Equipment failure			
3.11	Where was initial reperfusion treatment given?				Code n1	N
		0	No reperfusion attempted			
		1	Before admission to hospital	Treatment before reaching hospital regardless of who initiated treatment.		
		2	In A&E	Regardless of who initiated treatment there.		

		3	In CCU (direct admission)	A patient who enters CCU directly from an ambulance without assessment by hospital clinical staff before arrival.		
		4	In CCU (slowtrack)	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.		
		5	Elsewhere in hospital	Includes acute admission units, general medical wards and catheter laboratories.		
		6	Cath lab			
		9	Unknown			
3.13	Cardiac arrest date/time - FIRST ARREST ONLY			Date and time of FIRST verified arrest only to be reported. Excludes syncope or profound vagally-mediated bradycardia. Enter date and time of death if resuscitation not attempted.	DateTime	N
3.14	Cardiac arrest location				Code n1	N
		1	No arrest	Provides confirmation that patient did not have an arrest. The default option.		
		2	Before ambulance arrival	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 services.		
		3	After ambulance arrival	Implies arrest in the presence of a medic/paramedic.		
		4	A&E			
		5	CCU			
		6	Medical ward			
		7	Elsewhere in hospital	Refers to OPD, X-ray, etc.		
		8	Catheter lab			
3.15	Arrest presenting rhythm				Code n1	N
		1	Asystole			
		2	VF/pulseless VT	Also includes any other haemodynamically catastrophic tachyarrhythmia.		
		3	EMD	Also referred to as pulseless electrical activity.		
		9	Unknown			
3.16	Outcome of arrest			Applies only to outcome of the first arrest. This should include arrests 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'.	Code n1	N
		1	No return of circulation	Failed resuscitation.		
		2	Return of spontaneous circulation but died in hospital	Return of a stable circulation with subsequent death in hospital.		
		3	Discharged from hospital (with neurological deficit)			
		4	Discharged from hospital (no neurological deficit)			
		5	Resuscitation not attempted	This will be an decision normally made in advance of the arrest.		
		6	Transferred to another hospital			
		9	Unknown			
3.17	Admission ward			The purpose of this question is to determine where immediate care took place. 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.	Code n1	N

		1	Cardiac care unit	A unit providing level 2 facilities. This may be a cardiac care facility shared with ITU or HDU, or might be part of a cardiac ward or general ward, but providing a higher level of monitoring and cardiac nursing numbers and expertise.		
		2	Acute admissions unit	A unit for the assessment of non-specific acute medical admissions.		
		3	General medical ward	A medical ward without fixed monitoring facilities or additional cardiac nursing expertise.		
		4	Intensive therapy unit	Where this is separate from a CCU, and is not the usual place of care for early infarction (post-arrest or when CCU is full, etc).		
		5	Other	To record patients admitted to non-medical wards or who had infarction while already in hospital.		
		6	Died in A&E	Very important for interpretation of mortality data.		
		7	Cardiac ward (non CCU)	A cardiac ward, having staff with specific cardiac nursing expertise, but without necessarily higher numbers of staff / patient or central monitoring facilities.		
		8	Stepdown ward	A facility normally used primarily for patients after initial care on CCU.		
		9	Unknown			
3.19	Peak Troponin			This field is now numeric. No characters can be added. It is recognised that troponin may be reported as < (less than) or > (greater than) a certain value. Please follow the following conventions: If the reported value indicates that there is no (analysable) elevation of troponin enter zero, 0. If the reported value is greater than the upper limit of the assay range, enter the value at the upper limit: ie >50ng/ml, enter 50. If on near patient testing a range is given, enter the value at the upper limit: ie between 0.05 and 0.5 ng/ml, enter 0.5.	n4.2 [2 places of decimals please]	N
3.20	Unfractionated heparin			Use of unfractionated heparin as therapy for ACS or STEMI either alone or in conjunction with other treatment.	Code n1	N
		0	No			
		1	Yes	Record yes if used therapeutically while in hospital.		
		9	Unknown			
3.21	Low molecular weight heparin			As for unfractionated heparin.	Code n1	N
		0	No			
		1	Yes	Record yes if used therapeutically while in hospital.		
		9	Unknown			
3.22	Thienopyridine platelet inhibitor			e.g. Clopidogrel, Prasugrel	Code n1	N
		0	No			
		1	Yes	Record yes if on treatment at admission and drug continued or introduced while in hospital.		
		9	Unknown			
3.24	IV 2b/3a agent			Excludes use of 2b/3a agents started during PCI.	Code n1	N
		0	No			
		1	Yes	Record yes if used therapeutically while in hospital.		
		9	Unknown			
3.25	IV beta blocker				Code n1	N
		0	No			
		1	Yes	Record yes if used therapeutically while in hospital.		
		9	Unknown			
3.27	Calcium channel blocker				Code n1	N
		0	No			

		1	Yes	Record yes if on treatment at admission and drug continued or introduced while in hospital.		
		9	Unknown			
3.28	IV nitrate				Code n1	N
		0	No			
		1	Yes	Record yes if used therapeutically while in hospital.		
		9	Unknown			
3.29	Oral nitrate			Does not include sublingual nitroglycerine or spray in use on admission and continued or introduced in hospital on an as-needed basis.	Code n1	N
		0	No			
		1	Yes	Record yes if on treatment at admission and drug continued or introduced while in hospital.		
		9	Unknown			
3.30	Potassium channel modulator				Code n1	N
		0	No			
		1	Yes	Record yes if on treatment at admission and drug continued or introduced while in hospital.		
		9	Unknown			
3.31	Warfarin				Code n1	N
		0	No			
		1	Yes	Record yes if on treatment at admission and drug continued or introduced while in hospital.		
		9	Unknown			
3.32	Angiotensin converting enzyme inhibitor or angiotensin receptor blocker (ARB)				Code n1	N
		0	No			
		1	Yes	Record yes if on treatment at admission and drug continued or introduced while in hospital.		
		9	Unknown			
3.33	Thiazide diuretic				Code n1	N
		0	No			
		1	Yes	Record yes if on treatment at admission and drug continued or introduced while in hospital.		
		9	Unknown			
3.34	Loop diuretic				Code n1	N
		0	No			
		1	Yes	Record yes if on treatment at admission and drug continued or introduced while in hospital.		
		9	Unknown			
3.36	Thrombolytic drug			The agent used for first thrombolytic treatment.	Code n1	N
		1	Streptokinase			
		2	Alteplase			
		3	Reteplase			
		4	Tenecteplase			
3.37	Troponin assay			Troponin assay used.	Code n1	N
		1	Troponin I			
		2	Troponin T			
		3	High sensitivity Troponin T			
		9	Unknown			

3.38	Fondaparinux			Record if used while in hospital.	Code n1	N
		0	No			
		1	Yes			
		9	Unknown			
3.39	Initial reperfusion treatment			This refers to treatment given in your hospital.	Code n1	N
		0	None			
		1	Thrombolytic treatment			
		2	pPCI in house	Primary PCI for STE MI. Includes patients presenting with a clear history of AMI and LBBB.		
		3	Referred for consideration for pPCI elsewhere	Intended primary PCI for STEMI/LBBB. At the time of referral (or data entry) the reperfusion treatment actually performed may not be known. These cases will subsequently be linked with the interventional hospital record.		
9	Unknown					
3.40	Additional reperfusion treatment			Further emergency reperfusion treatment where initial treatment may have failed.	Code n1	N
		0	None			
		1	Rescue PCI in house	Emergency PCI for acute STEMI for failed thrombolysis - commonly performed for failure of ST segment resolution or continuing ischaemic symptoms following lytic treatment. Performed in this hospital for either patients admitted directly or transferred from another hospital.		
		2	Referred for rescue PCI elsewhere	Intended rescue PCI. At the time of referral (or data entry) the treatment performed may not be known.		
		3	Facilitated PCI	Elective PCI performed in the acute setting following lytic treatment for STEMI (or new LBBB).		
		4	Additional dose of thrombolytic	Use where a second thrombolytic is given for perceived failure of reperfusion. Do not use when another lytic is substituted for streptokinase because of adverse effects occurring during SK infusion.		
3.41	In patient management of hyperglycaemia/diabetes			Treatment given during the first 24 hours (or longer), even if this regime is subsequently changed. Each insulin regime may be in combination with oral therapy. Diabetic treatment should be recorded regardless of whether the patient is known to be diabetic or presents for the first time with hyperglycaemia.	Code n1	N
		0	None	No pharmacological diabetic treatment was given during the admission. See option 7.		
		1	Glucose insulin regime	Insulin by pump with additional IV glucose according to local protocol.		
		2	Insulin pump	Insulin by pump.		
		3	Multi dose insulin	3 or more individual doses of subcutaneous insulin / 24 hours, either as regular doses or sliding scale insulin. This may be a continuation of the preadmission regime where 3 or more doses / day was used.		
		4	Other pre-admission insulin regime	Insulin regime of 2 or less doses per 24 hours.		
		5	Oral medication only	Any form of oral medication without any insulin.		
		7	Diet only	For <u>known</u> diabetics continuing (low carbohydrate) diet without additional medication.		
9	Unknown					
3.42	Diabetic therapy at discharge			Oral therapy may be given in combination with insulin.	Code n1	N
		0	None			
		1	Multi dose insulin regime	Insulin given three or more times daily.		
		2	Other insulin regime	Insulin less than three times daily.		
		3	Oral medication	Any oral medication used without insulin.		
		4	Insulin plus oral medication			
		5	Diet only	A low carbohydrate diet for diabetes.		
		6	Not applicable	For patients who die or are transferred to another hospital		
9	Unknown					

3.43	Oral beta blocker			In hospital use.	n1	N
		0	No			
		1	Yes			
		9	Unknown			
3.44	Aldosterone antagonist			In hospital use, includes Eplerenone and Spironolactone.	n1	N
		0	No			
		1	Yes			
		9	Unknown			
3.46	Date/time of arrival at non interventional hospital			Date and time of arrival of ambulance at non interventional hospital. Date and time of arrival (when the wheels stop turning) at non interventional hospital. Where a hospital does not provide 24/7 intervention it is a non-interventional hospital outside of these hours.	Date/ time	
3.47	Assessment at non interventional hospital			Place of assessment after arrival at non interventional hospital.	Text	
		0	No contact with a non-interventional hospital	Where a hospital provides a less than 24/7 interventional service, it should be categorised into interventional / non-interventional depending on whether the lab is open at the time of presentation.		
		1	Patient remains in ambulance	Ambulance parked in hospital grounds in order to facilitate assessment by a member of hospital staff.		
		2	A&E	Patient is moved into A&E for assessment.		
		3	Acute assessment unit	Other non-cardiac specific ward.		
		4	CCU / cardiac facility	Cardiac facility. Any area with specialised nursing staff.		
		5	Self-referral	Patient made own way to non-interventional hospital.		
		6	Already in hospital	Admitted prior to this event. Eg., already in hospital with ACS, and develops new symptoms with ST elevation. <i>Or</i> , after admission with ACS, transferred for intervention as part of routine care for ACS.		
		9	Unknown			
3.48	Assessment at interventional centre			Place of assessment after arrival at interventional centre.	Text	
		1	Assessed in A&E	Self-presenters might be assessed here.		
		2	Acute assessment unit	A non-specific area for assessment of acute admissions.		
		3	CCU / cardiac facility	Facility with specialised nursing staff.		
		4	Catheter laboratory	Including areas immediately adjacent.		
		5	Already in hospital	Already in interventional hospital.		
		9	Unknown			
3.49	Intended reperfusion procedure			Intended reperfusion treatment after assessment at interventional centre.	Text	
		0	None			
		1	Primary PCI			
		2	Rescue PCI	A procedure for continuing symptoms / features of non-reperfusion for STEMI.		
		3	Thrombolytic treatment	Note. If intended reperfusion treatment was with lytic drug - which was not given - use MINAP 3.08 to explain why. If lysis used, existing MINAP fields will cover.		
		4	Other coronary intervention	Covers all interventions other than for acute management of STEMI, e.g. elective intervention for STEMI / nSTEMI or for new symptoms.		
		9	Unknown			
3.50	Procedure performed			Intended treatment may not necessarily occur; lab may be unavailable, etc.	Text	
		1	No angiogram			
		2	Angiogram but no PCI			
		3	Angiogram and PCI			

		9	Unknown			
3.51	Why was no angiogram performed?	0	Not applicable	Where angiography has been performed.	Text	
		1	Diagnosis not ACS	Another diagnosis - not an acute coronary syndrome - was established.		
		2	Patient refused			
		3	Patient died			
		4	Complication before angio could be performed	An acute medical event resulting in cancellation of a planned angiogram / intervention.		
		5	Angio inappropriate due to co-morbidity	Patient co-morbidity made angio inappropriate. For use where there is advanced malignancy, dementia, progressive neurological disease or other conditions having an immediate impact on prognosis. Includes other clinical reasons identified by the clinician.		
		6	Technical failure	Any operator related failure, including failure of arterial access.		
		7	Lab unavailable	Access to lab not possible at a time when lab normally available.		
		8	Other	Including absent staff or equipment problems.		
		9	Unknown			
3.52	Why was no intervention performed?	0	Not applicable	Where pPCI or other coronary intervention has been performed.	Text	
		1	Patient refused	Patient refused intervention after angio.		
		2	Patient died	Patient dies after angio.		
		3	Complication before PCI could be performed	An acute medical event preventing intended procedure from starting.		
		4	PCI felt to be inappropriate	eg Because of co-morbidity, eg., acute VSD, cardiac rupture; acute MR; coronary spasm, spontaneous dissection; thrombus treated with drug therapy (e.g. ReoPro and heparin), etc		
		5	Angiographically normal coronaries / mild disease / Infarct Related Vessel unclear			
		6	Surgical disease			
		7	Technical failure	Any technical / operator failure after starting interventional procedure, including no arterial access.		
		8	Other			
		9	Unknown			
4.01	Date of discharge			Includes date of transfer to another hospital (but not as a day case), and date of death.	Date	N
4.02	Discharge diagnosis			The biochemical 'definition' of infarction remains imprecise because of the variations in assay performance. Until a standardised assay becomes available it is recommended that these definitions are used.	Code n1	N
		1	Myocardial infarction (ST elevation)	There will normally be a history consistent with the diagnosis. The diagnosis requires the presence of cardiographic changes of ST elevation consistent with infarction of ≥ 2 mm in contiguous chest leads and/or ST elevation of ≥ 1 mm ST elevation in 2 or more standard leads. (New LBBB is included; although ST elevation is usually apparent in the presence of LBBB). There must be enzyme or troponin elevation. Where CK is used the peak value should exceed twice the upper limit of the reference range. Where troponin assay is used the locally accepted cut off value should be used. (See Threatened MI) This group includes all patients with STEMI regardless of whether typical changes were evident on the admission ECG or developed subsequently.		
		3	Threatened MI	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 or a small troponin release. If only troponin has been measured and is elevated; it is a local decision whether this is recorded as 'Definite infarction' or 'Threatened infarction'.		

		4	Acute coronary syndrome (troponin positive)/ nSTEMI	ACS troponin positive includes all those patients previously defined as nSTEMI. There must be symptoms consistent with cardiac ischaemia and there will normally be cardiographic changes consistent with this diagnosis. Troponin elevation above locally determined reference level is mandatory.		
		5	Acute coronary syndrome (troponin negative)	Use where there are symptoms consistent with cardiac ischaemia without troponin release. There must be dynamic ECG changes consistent with fluctuating ischaemia. Synonym unstable angina.		
		6	Chest pain of uncertain cause	Use in any patient admitted with chest pain not accompanied by significant cardiographic change, without any 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.		
		7	Myocardial infarction (unconfirmed)	This diagnosis must only be applied to patients who die in hospital before biochemical confirmation of infarction can be confirmed.		
		8	Other diagnosis	Use where a patient is admitted with clinical suspicion of cardiac pain and where any diagnosis other than cardiac ischaemia is confirmed.		
4.03	Bleeding complications			This should be used for bleeding following any therapeutic intervention, whether drug (including pre-hospital thrombolysis) or primary PCI (including sheath removal) but not including bleeding complications following repeat angiography/intervention. Use should be limited to bleeding occurring within 24 hours of the finish of any therapeutic intervention. Options are given in order of precedence: use the first option that applies.	Code n1	N
		0	None			
		1	Intracranial bleed	Of any severity. Should ideally be confirmed by scanning.		
		2	Retroperitoneal haemorrhage	Of any severity. Should ideally be confirmed by scanning.		
		3	Any bleed with Hb fall > 5g	From any site except options 1 and 2.		
		4	Any bleed with Hb fall > 3g and < 5g			
		5	Any bleed with Hb fall < 3 g			
		9	Unknown			
4.04	Death in hospital				Code n1	N
		0	No			
		1	From MI	From all causes attributable to index event; whether due to VF, or cardiogenic shock.		
		2	From complication of treatment	Death from haemorrhagic stroke or other bleed as a result of treatment.		
		3	Other non cardiac related cause			
		4	Other cardiac cause	Death due to heart failure, or arrhythmia etc, where there was NO acute coronary event leading to this admission, or occurring during the admission but where the patient had been logged in MINAP.		
		9	Unknown			
4.05	Discharged on beta blocker			Discharged from hospital on oral beta adrenergic blocker treatment. Patients transferred are not included in analysis of use of secondary prevention drugs.	Code n1	N
		0	No			
		1	Yes	Use 1. Yes if patient was on the drug at admission and treatment was continued while in hospital.		
		2	Contraindicated			
		3	Patient declined treatment			
		4	Not applicable	For patients who die or are transferred to another hospital.		
		8	Not indicated			
		9	Unknown			
4.06	Angiotensin converting enzyme inhibitor or angiotensin receptor blocker			Discharged from hospital on angiotensin converting enzyme inhibitor or angiotensin receptor blocker. Patients transferred are not included in analysis of use of secondary prevention drugs.	Code n1	N
		0	No			

		1	Yes	Use 1. Yes if patient was on the drug at admission and treatment was continued while in hospital.		
		2	Contraindicated			
		3	Patient declined treatment			
		4	Not applicable	For patients who die or are transferred to another hospital.		
		8	Not indicated			
		9	Unknown			
4.07	Discharged on statin			Discharged from hospital on a statin. Patients transferred are not included in analysis of use of secondary prevention drugs.	Code n1	N
		0	No			
		1	Yes	Use 1. Yes if patient was on the drug at admission and treatment was continued while in hospital.		
		2	Contraindicated			
		3	Patient declined treatment			
		4	Not applicable	For patients who die or are transferred to another hospital.		
		8	Not indicated			
		9	Unknown			
4.08	Discharged on aspirin			Discharged from hospital taking aspirin. Patients transferred are not included in analysis of use of secondary prevention drugs.	Code n1	N
		0	No			
		1	Yes	Use 1. Yes if patient was on the drug at admission and treatment was continued while in hospital.		
		2	Contraindicated			
		3	Patient declined treatment			
		4	Not applicable	For patients who die or are transferred to another hospital.		
		8	Not indicated			
		9	Unknown			
4.09	Cardiac rehabilitation			Refers specifically to further rehabilitation arranged after discharge (as rehabilitation in the sense of lifestyle advice will already have been given).	Code n1	N
		0	No			
		1	Yes			
		3	Patient declined			
		8	Not indicated	Further rehabilitation may not be indicated because of severe comorbidity etc.		
		9	Unknown			
4.10	Exercise test			Performance of an exercise test during this admission.	Code n1	N
		0	No			
		1	Yes			
		2	Planned after discharge	Only use this option when firm arrangements are in place before discharge.		
		8	Not indicated			
		9	Unknown			
4.11	Echocardiography			Performance of an echocardiograph during this admission.	Code n1	N
		0	No			
		1	Yes			

		2	Planned after discharge	Only use this option when firm arrangements are in place before discharge.		
		8	Not indicated			
		9	Unknown			
4.12	Radionuclide study			Performed at this admission.	Code n1	N
		0	No			
		1	Yes			
		2	Planned after discharge	Only use this option when firm arrangements are in place before discharge.		
		8	Not indicated			
		9	Unknown			
4.13	Coronary angiography			Coronary angiography performed or arranged, but not as part of the initial reperfusion strategy.	Code n1	N
		1	Protocol driven investigation performed in this hospital	Angiography indicated on basis of risk factors.		
		2	Symptom driven investigation performed in this hospital	Angiography performed for continuing symptoms.		
		3	Protocol driven investigation performed at another hospital	Angiography indicated on the basis of risk factors. The hospital may be within or outside your own Trust.		
		4	Symptom driven investigation performed at another hospital	Angiography indicated for continuing symptoms. The hospital may be within or outside your own Trust.		
		5	Planned after discharge	Only use this option when firm arrangements are in place before discharge.		
		6	Not applicable	For use when there is advanced malignancy, dementia, progressive neurological disease or other conditions having an immediate impact on prognosis. Includes other clinical reasons identified by the clinician.		
		7	Patient refused			
		8	Not performed			
		9	Unknown			
4.14	Coronary intervention			Coronary intervention during this episode performed either in your hospital or by referral to another hospital. Do not use for primary PCI or rescue which are covered by 3.39 and 3.40.	Code n1	N
		1	Percutaneous coronary intervention			
		2	CABG			
		4	PCI planned after discharge			
		5	CABG planned after discharge			
		6	Not applicable	For use when there is advanced malignancy, dementia, progressive neurological disease or other conditions having an immediate impact on prognosis. Includes other clinical reasons identified by the clinician.		
		7	Patient refused			
		8	Not performed or arranged			
		9	Unknown			
4.15	Date of referral for investigation/intervention			The date on which a referral for angiography and possible intervention was made, either locally or to another centre.	DateTime	N
4.16	Discharge destination				Code n1	N
		1	Home			
		2	Other hospital			
		3	Convalescence			
		4	Death			

		8	Other specialty in same hospital	Where a patient is transferred to another specialty for a specific reason, such as rehabilitation following a CVA, or nephrologists for dialysis. It does NOT include a transfer from cardiologists to general physicians to continue care of the original event before discharge.		
		9	Unknown			
4.17	Daycase transfer date			The date on which transfer took place for daycase investigation and/or interventional treatment. Arranged daycase transfers are not discharged from hospital. If a patient is discharged (to another hospital) leave this field blank, and use fields 4.01 and 4.16. This allows recording of interval between referral and procedure. Dates for 4.18 and 4.19 will be the same date where PCI follows angiography at the same procedure, but it is likely that for some time angiography in a DGH to be followed by intervention elsewhere. This option will be covered by either 4.17, in the case of a day case transfer or by 4.01 & 4.16 for a patient discharged.	Date	N
4.18	Local angio date			Where this takes place in your hospital during the present admission.	Date/Time	N
4.19	Local intervention date			Where this takes place in your hospital during the present admission. Use where first intervention or surgery is performed on site.	Date	N
4.20	Interventional centre code			Code for interventional centre.	Code a3	N
4.21	Referring hospital code			Code of hospital from which patient was referred for any investigation or intervention. (See field 1.01 for valid codes).	Code a3	
4.23	Followed up by			Follow up refers to a formal outpatient arrangement.	Code n1	N
		1	Cardiologist	Includes cardiology team.		
		2	Non cardiologist			
		3	No follow up	Where no arrangements for hospital follow up is made by the discharging hospital. Do not use when patient transferred elsewhere.		
		4	Not applicable	E.g. patient transferred to another hospital or death in hospital.		
		9	Unknown	Unknown may be used when patient is referred to another hospital.		
4.24	Reinfarction			An event occurring during this admission. Ischaemic pain or other symptoms consistent with acute cardiac ischaemia (eg sweating, nausea, hypotension) persisting until relieved by analgesia or nitrates, accompanied by new cardiographic changes (new ST elevation or depression or T wave changes in the territory of the initial event) These features must be accompanied by new elevation of CK or other acute marker of cardiac necrosis to more than the upper limit of normal or an increase to a value $\geq 50\%$ greater than the last recorded value.	Code n1	N
		0	No			
		1	Yes			
		9	Unknown			
4.26	Date of return to referring hospital			For use when a patient is admitted to a DGH, transferred to an interventional centre and returns to the DGH.	Date	N
4.27	Discharged on a thienopyridine inhibitor			e.g. Clopidogrel, Prasugrel	Code n1	
		0	No			
		1	Yes			
		2	Contraindicated			
		3	Patient declined treatment			
		4	Not applicable	For patients who die or are transferred to another hospital.		
		8	Not indicated			
		9	Unknown			
4.28	Discharged on an aldosterone antagonist			Includes Eplerenone and Spironolactone.	Code n1	
		0	No			
		1	Yes			

		2	Contraindicated			
		3	Patient declined treatment			
		4	Not applicable	For patients who die or are transferred to another hospital.		
		8	Not indicated			
		9	Unknown			
4.29	What procedure was performed at the interventional hospital?			For use by non-interventional hospitals when patients return after an intervention.	n1	
		0	No angio or primary reperfusion treatment performed			
		1	Angiogram only			
		2	Primary angioplasty			
		3	Rescue angioplasty			
		4	CABG			
		5	Thrombolytic treatment			
		9	Unknown			
5.1	Smoking cessation advice given			As documented in case record. NICE MI secondary prevention audit criteria.	n1	
		0	No			
		1	Yes			
		2	Planned in rehab			
		3	Not applicable			
		9	Unknown			
5.2	Dietary advice given during this admission			As documented in case record. NICE MI secondary prevention audit criteria.	n1	
		0	No			
		1	Yes			
		3	Planned in rehab			
		4	Not applicable			
		9	Unknown			