

DATA COLLECTION FOR THE

**MYOCARDIAL ISCHAEMIA
NATIONAL AUDIT
PROJECT**

APPLICATION NOTES

**Version 6
March 2009**



National Institute for Clinical Outcomes Research

Data Collection for the Myocardial Ischaemia National Audit Project

Introduction

The Myocardial Ischaemia National Audit Project (MINAP) is now in its ninth 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 670,000 records collected over 8 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 123 in the present version. 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! The dataset has grown in order to cover all aspects of care of patients having acute coronary syndromes (ACS). This revision (March 2009) 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), successor to the Healthcare Commission, can request data from MINAP when they have to make specific enquiries into performance by an organisation. It pays to have first class data!

Over the last 2-3 years there has been substantial development of the use of primary PCI for ST elevation infarction, resulting in increased complexity of data collection as patients move from one hospital to another for different aspects of care. MINAP has addressed these requirements in this revision of the dataset.

The new fields, and those removed are listed in Section 1. The main group of additional fields in this revision allow examination of the appropriate use of provision of interventions. They are for use only in interventional hospitals, and allow more detailed analysis of the performance of interventions including primary PCI, not from a technical viewpoint, but from a performance management view. Fields have also been added relating to published NICE guidance on secondary prevention.

The completion of a web based application for MINAP is a far reaching development. This is presently being tested in some hospitals, and roll out is planned for the next few months. There will be a period in which both the new web application and the existing Lotus Notes Application (to which these notes apply) will run in tandem, but we hope that there will be a complete migration to the web based application when colleagues see the benefits of doing so. There will be a new version of the Application Notes to cover the requirements of the web application, and this is the last edition of the Application Notes applicable to the Lotus Notes version.

MINAP continues strongly to support 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 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 8.1

This version of the dataset (v 8.1) adds 16 new fields of which 7 are for interventional centres only. These are fields mainly related to the increased use of primary PCI and allow recording of information on transfer of patients between local hospitals and interventional centres. There are modifications to other fields, either at the request of users, or to adjust to new circumstances. MINAP cannot stand still whilst care for patients with ACS evolves around it! The changes and additions are listed below and described in detail in the appropriate section.

1.1 New fields

- 2.37 ECG QRS complex duration
- 2.38 Thienopyridine inhibitor use (prior to admission)
- 3.43 Oral beta blocker (in hospital use)
- 3.44 Aldosterone antagonist (in hospital use)
- 3.46 Date/time of arrival at non interventional hospital
- 3.47 Assessment at the non interventional hospital
- 3.48 Assessment at interventional centre
- 3.49 Intended reperfusion procedure
- 3.50 Procedure performed
- 3.51 Why was no angiogram performed
- 3.52 Why was no intervention performed
- 4.27 Discharged on a thienopyridine inhibitor
- 4.28 Discharged on an aldosterone antagonist
- 4.29 What procedure performed at the interventional hospital
- 5.1 Smoking cessation advice given
- 5.2 Dietary advice given during this admission

1.2 Fields removed

- 2.27 Clopidogrel use
- 3.12 Whose initial decision to reperfuse
- 3.18 Peak CK
- 3.23 Other oral anti platelet agent
- 3.35 Spironolactone
- 4.25 Discharged on Clopidogrel

The new dataset (MINAP v 8.1) with additional definitions and context sensitive help is in Appendix 2. It is also available together with a data collection form and a list of the new fields and options on the RCP website at <http://www.rcplondon.ac.uk/clinicalstandards/organisation/partnership/Pages/MINAP-.aspx> and on the CCAD website <http://www.ic.nhs.uk/services/national-clinical-audit-support-programme-ncasp/heart-disease/getting-started/information-on-datasets>

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, especially from a performance management viewpoint. These now include

- Cardiac networks and Commissioners
- Ambulance service trusts. We have developed an ambulance outcome database that allows Ambulance trusts to access MINAP outcome data on their patients
- Strategic Health Authorities. Quarterly aggregate analyses
- The Department of Health and Welsh Assembly Government. Quarterly aggregate analyses
- The Healthcare Commission. Data with which to perform hospital based analyses for their annual Healthcheck. The Healthcare Commission, about to become the Care Quality

Commission (CQC), 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

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 increasingly strict rules for the use of potential patient identifiers. Although you enter 'hard' patient identifiers into the MINAP record, these are not normally 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 not imported to CCAD, and are there for your local use.
- Date of birth is presently used internally within MINAP. Researchers are given patient age to 2 decimals.
- 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 identity. Not normally available for research purposes. Where analyses are made for individual hospitals this is performed using a pseudonymised identifier.
- Post code of residence is potentially an identifier where very small numbers of individuals share a post code in rural areas. Used to derive other post code dependant data 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

The Healthcare Commission presently base their assessment of your hospital on a large number of items including participation in the MINAP audit. These requirements are likely to be similar when the Healthcare Commission becomes the Care Quality Commission in April 2009. The original NSF targets still provide the basis on which performance in the care of infarction is measured by the Healthcare Commission. Their indicators vary year by year, and the up to date indicator targets can be accessed at <http://www.healthcarecommission.org.uk/guidanceforhealthcarestaff/nhsstaff/annualhealthcheck/annualhealthcheck2008/09/qualityofs/timetoreperfusion.cfm>

Summary of data required by CQC

Call to Needle remains an important measure of the combined performance of the ambulance service and the hospital. However the increasing provision of primary PCI is reducing the numbers who require thrombolytic treatment. We are developing a parallel measure for Call to Balloon for those having primary PCI to be used along side the original Call to Needle measure.

Data completeness and Validation. The CQC uses both the MINAP data completeness score and the mandatory validation survey as a part of the annual Healthcheck.

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 3.8.4. 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. Less than 50% records are entered within 4 weeks of an admission, and only about 90% at three months. MINAP analyses are made available to SHAs, ambulance trusts 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 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 new interventional audit fields allow closer examination of process of care for those referred for primary PCI. 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 may only be within the interventional centres for a few hours must be recorded. We suggest this is limited to fields listed in Rapid repatriation patients in Section 18.1.1, based on practice at Leeds General Infirmary.

3.4 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.

3.5 Logging patients with ACS not admitted to cardiac wards

In 2008 MINAP data showed that less than 50% of patients with non ST elevation infarction are admitted to a CCU or other cardiac ward, receive less secondary prevention medication, 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. 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.

3.6 Logging patients to provide case fatality data

Vital status and date of death are available from the Office of National Statistics. We can provide you with case fatality data only if you have provided the NHS number. The NHS number should always be made available to you by your records staff, see Section 6.

3.7 Logging patients with cardiac arrest in A&E

Early care for acute infarction has shifted into the A&E department and outside to the ambulance service. 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.

3.8 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 <http://www.opsi.gov.uk/ACTS/acts1998/19980029.htm#aofs> to ensure that the data should meet the necessary standards of completeness, accuracy and relevance.

3.8.1 Data completeness

The analysis is now based on records with a Discharge diagnosis of 2. *Myocardial infarction (non ST elevation)* and 4. *Acute coronary syndrome (troponin positive)*. Data completeness for these key fields is currently 98% nationally. Annual data completion scores of more than 90% form part of the evidence of participation in MINAP for the CQC annual Healthcheck. In future years 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 construction for the participation in heart disease audits indicator for 2008/9 is available at <http://www.healthcarecommission.org.uk/guidanceforhealthcarestaff/nhsstaff/annualhealthcheck/annualhealthcheck2008/09/qualityofs/participationinheartdiseaseaudits.cfm>
We may exclude from the analysis data from any hospital that is less than 90% complete for two continuous quarters. The data completeness fields are listed in Appendix 1.

3.8.2 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 data set 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 for the CQC annual Healthcheck.

3.8.3 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.

3.8.4 Exporting data to Excel

We recommend that you check analyses in your audit reports by downloading your data into Excel using the Export V8 Dataset option under Import/Export. The export includes data items from v7 of the dataset that have been removed in v8.1. 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 8)

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 gives 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 it is probably best to 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.

7 Admission details

7.1 Initial diagnosis

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. This option is only to be used where there are unequivocal changes of ST elevation infarction or new LBBB on the initial ECG and appropriate history, and are thus eligible for consideration for reperfusion treatment. LBBB of uncertain duration should be recorded as *3. Acute coronary syndrome*.

Exception. 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*.

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 infarction*. Where this is a misdiagnosis the Discharge diagnosis will make this clear.
- Patients who are misdiagnosed with an ST elevation MI should always be logged
- Where there is LBBB and thrombolytic treatment is given the Initial diagnosis is *1. Definite myocardial infarction*.
- Where there is LBBB 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.

The option *2. Probable myocardial infarction* has been removed and *3. Acute coronary syndrome* should now be used all other suspected acute coronary syndromes previously categorised as *2. Probable infarction*.

3. Acute coronary syndrome

Covers all other suspected acute coronary syndromes including cases previously categorised as *2. Probable infarction*. Confirmation of the diagnosis awaits results of troponin assay. 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.

Patients with ST elevation AMI, in whom the diagnosis was missed should be entered as *1. Definite myocardial infarction* and these patients will now be included in analyses if they received thrombolytic treatment.

7.2 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.

Date/time of symptom onset

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

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. 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.

Date/time of arrival of first responder

This was previously the time of arrival of first professional help and now also includes a community first responder or a paramedic in a car.

Date/time of arrival of ambulance services

This was previously the time of arrival of the emergency service. It now refers to 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

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.

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.

If the patient is already in hospital, enter the admission date and 00:00 as the time.

7.3 How did the patient get to hospital

In every case the caller refers to the patient, other non professional in attendance or other health professional. Patients that have no method of admission 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.

1. Called GP who saw patient then called emergency services should be when the patient sees a GP or other health professional at a surgery or drop in night time clinic or walk in centre.

8. Patient already in 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.

9. Transferred for PCI/surgery To be used where admission is by transfer from another hospital for primary or rescue PCI. This is should not be used for transfer for any other reason, such as subsequent intervention on a stable patient. See Section 18 for details on recording transfers.

10. Transferred for initial treatment A transfer from another hospital (including other hospitals within your Trust) for thrombolytic treatment, or continuing care after this has been given. Do not use where transfer is for intervention or surgery.

11. Other Includes other routes of entry to hospital (eg became ill visiting in hospital).

12. Inter hospital transfer For use where admission follows the return of a patient from an interventional centre following primary PCI or rescue PCI. NB a MINAP record should be started in a non interventional hospital following primary PCI and transfer back for further management. This will be linked with the record made in the interventional centre to measure total length of stay etc.

7.4 Ambulance job number

Select the relevant 3 letter ambulance trust code and enter the PRF/CAD number and the Ambulance job number is automatically created from the date of call for help. 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.

7.5 Type of admitting consultant

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.

7.6 Admission ward

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 majority of 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.

7.7 Systolic BP on admission

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 systolic BP after treatment should be used.

7.8 Heart rate on admission

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.

7.9 Where was aspirin/other antiplatelet given

Identifies if and when aspirin or other antiplatelet drug was first given to patient. This includes Clopidogrel and other thienopyridines 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*

7.10 Place first ECG performed

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*

7.11 ECGs performed by ambulance paramedics

The care of AMI begins with a 999 call for the majority, and ambulance crews are all now performing 12 lead ECGs. Development of ST elevation may not be immediate, and the very early changes which develop into ST elevation may be quite subtle. The following scheme shows how data will be used in relation to pre-hospital treatment.

Ambulance ECG	Pre-Hosp lysis	Initial Hosp ECG	Hospital lysis	Initial Diagnosis	CTN	DTN
+ STE	✓	-	-	Definite MI	✓	X
+ STE	X Outside ambulance criteria	+ STE	✓	Definite MI	✓	✓
LBBB	X Outside ambulance criteria	LBBB	✓	Definite MI	✓	✓
- STE	X	+ STE	✓	Definite MI	✓	✓
- STE	X	- STE	✓	ACS	X	X

+ STE = ST elevation, - STE = no ST elevation

7.12 Height and Weight

Values for height and weight may be entered in imperial units which will be converted to metric units and the BMI calculated automatically.

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 18 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 This only refers to the initial reperfusion strategy. 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. These cases will subsequently be linked with the interventional centre record.

9. *Unknown*

Reason reperfusion treatment not given 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 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 now include any 12 lead ECG performed in the pre-hospital setting. 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.

2. *Left bundle branch block* Unless there is definite ST segment elevation in addition to LBBB, the initial diagnosis for a patient with LBBB of uncertain duration should now be recorded as 3. *Acute coronary syndrome* now as Initial diagnosis of Probable myocardial infarction has been removed.

ECG QRS complex duration This is a new field allowing 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 This field is limited to ST segment elevation infarction, with options

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 changes. 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.

The field Whose initial decision to reperfuse has been removed.

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 the ECG must have been 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 co-morbidity 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.

Then complete **ECG determining treatment** and **Site of infarction**.

8.2 Patient is eligible for reperfusion treatment

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

Where was initial reperfusion treatment given 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.

Date/time of reperfusion treatment This refers to the onset on thrombolytic treatment or the time of first balloon inflation for primary PCI. Balloon time is the first device time (balloon, or stent or aspiration device etc) whether or not it establishes flow, but not guidewire (unless this establishes TIMI3 flow). The delay to thrombolytic treatment was an NSF target, the time to primary PCI is not, so these will be analysed separately. If thrombolytic treatment is given before admission this will be recognised and can be analysed separately.

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

Delay before treatment

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 none of the delays to treatment exclude 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. You should not enter a delay before treatment if the Call to Needle is <60 mins or Door to Needle <30 mins as some delays will remove the patient from analyses.

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, 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. 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. See 7.11.

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. See Section 7.11

There are options for primary PCI.

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.*

Only 1. *Sustained hypertension*, 2. *Clinical concern about recent cerebrovascular event or recent surgery*, 3. *Delay obtaining consent*, 5. *Cardiac arrest*, 8. *Ambulance procedural delay* and 9. *Other* exclude patients from Door to Needle or Call to Needle analyses. It is not mandatory to use a delay option if it is felt that the delay was trivial.

Additional reperfusion treatment

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* Elective PCI performed in the acute setting following lytic treatment for STEMI (or new LBBB). [It is recognised that this option is unlikely to be used at present]

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.

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 new 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 be included in Door to Needle analyses when previously there were excluded. You should keep a local record of these for training purposes.

8.3 Patient is initially not eligible for reperfusion treatment

Some patients, initially not eligible for reperfusion treatment because there is no ST elevation may become eligible for reperfusion treatment when ST elevation develops subsequently. They should be logged. In this circumstance the Initial diagnosis is not *1. Definite myocardial infarction*. These patients are excluded from the Door to Reperfusion analyses. Use option *4. Initial ECG ineligible* in Delay before treatment so that you can record that reperfusion was performed after ST elevation developed while in hospital.

Exception to this rule. If the initial 12 lead ECG performed in the ambulance is not diagnostic and the first ECG performed in hospital shows ST segment elevation, then this should be entered as *1. Definite myocardial infarction*. These patients will be included in Door to Needle, Call to Needle, Door to Balloon and Call to Balloon analyses.

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 new fields allow examination of the process of evaluation for primary PCI and rescue PCI. They are equally appropriate for use for revascularisation following other ACS. They are for use in interventional centres only. A MINAP record should be started 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

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

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.
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

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

Intended reperfusion treatment after assessment at interventional centre.

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

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?

0. *Not applicable* 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.
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.
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?

0. *Not applicable* 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.
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*

Referring hospital code 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 to an interventional centre.

10 Tests

Cholesterol A value ideally recorded during the first 24 hours after admission.

Glucose taken on admission (not necessarily fasting). If results are not available or not performed for cholesterol and glucose do not enter 0, (zero), but leave blank. This applies for glucose which is part of the data completeness score.

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

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

Were cardiac enzymes/markers elevated during this admission Traditional 'cardiac enzymes' are little used at present and Troponin assay is universal. This field should summarise the results of the troponin assay as a Yes / No response, with the response reflecting presence/absence of elevation beyond the upper reference limit (upper limit of normal for the local assay).

Peak Troponin is 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 Please indicate which assay is used locally.

The field Peak CK has been removed.

11 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

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

Hypertension

Hypercholesterolaemia Treatment by diet or medication.

Peripheral vascular disease

Asthma or COPD

Chronic renal failure

Heart failure Pre-existing treated heart failure.

Diabetes

Cerebrovascular disease

Smoking status

Previous CABG

Previous PCI

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

12 Therapy

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

12.1 Therapy in use prior to admission

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

The field referring specifically to Clopidogrel has been removed and archived.

12.2 Therapy given during admission

There is a new field to record the use of **Oral Beta blockers** given during admission. Other oral antiplatelet has been removed and Angiotensin II blocker (ARB) has been renamed **Angiotensin**

converting enzyme inhibitor or Angiotensin receptor blocker. Spironolactone has been archived and replaced with **Aldosterone antagonist** (includes Eplerenone and Spironolactone).

For all drugs there are options

0. *No*

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

9. *Unknown.*

12.3 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.

12.3.1 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. 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.

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.*

12.3.2 Diabetic therapy at discharge

If oral therapy is given in combination with insulin record under the appropriate insulin regime.

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.

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

6. *Not applicable* A new option for use when the patient not considered to be diabetic at discharge.

9. *Unknown.*

13 Complications

13.1 Bleeding complications

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.*

13.2 Death in hospital

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 can be recorded in several places; please ensure your entries do not contradict each other.

13.3 Re-infarction

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.

13.4 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.

Did the patient have a cardiac arrest (if so where?)

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

The dataset only applies to first arrests.

Presenting rhythm

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

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 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. The Discharge date will be the Date of death.

14 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 Coronary angiography performed or arranged but does not refer to coronary angiography preceding primary PCI. For patients that have primary PCI, use 8. *Not performed* rather than blank as previously recommended as Coronary angiography is a data completion field. There are new 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 Coronary intervention during this episode performed either in your hospital or by referral to another hospital. Do not use for primary PCI or rescue PCI which are covered by Initial reperfusion treatment and Additional reperfusion treatment. Enter the procedure if you know what has been done (ie locally), otherwise if the intervention takes place elsewhere and you have no information use 9. *Unknown*.

There are new 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.

Left ventricular ejection fraction 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 $< 30\%$.

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

Date of referral for investigation/intervention 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.

Was the patient transferred for investigation/intervention with options:

No

Yes Daycase

Yes Admitted

Daycase transfer date 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 Where this takes place during the present admission.

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

What procedure was performed at the interventional hospital

A new field for use by non interventional hospitals when a patient returns after an intervention, with 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*

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

Patient case record number at referring hospital Patient case record number at the hospital from which the patient was referred for further investigation/treatment. It can be used to identify a patient when they are transferred to an interventional centre for PCI/intervention.

Date of return to referring hospital 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.

14.1 Non invasive tests/rehabilitation

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

Cardiac rehabilitation 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.

15 Discharge details

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

15.2 Discharge diagnosis

1. Myocardial infarction (ST elevation) There should 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 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 After early reperfusion treatment there may be rapid resolution of existing ST elevation associated with a small troponin release. If troponin is elevated, it is a local decision whether this is recorded as definite infarction or threatened infarction.

4. Acute coronary syndrome (troponin positive)

The option *2. Myocardial infarction (nSTEMI)* has been removed. 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.

5. Acute coronary syndrome (troponin negative) Use this diagnosis where there are symptoms consistent with cardiac ischaemia without troponin release. There must be 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.

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.

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.

15.3 Discharge destination

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.

15.4 Followed up by 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 A new 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 A new option for patients who die or are transferred to another hospital previously entered as *9. Unknown*.

9. Unknown

15.5 Cardiological care during admission

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.

15.6 Secondary prevention medication on discharge

Discharged on aspirin or other antiplatelet has been changed to **Discharged on aspirin**. Discharged on Clopidogrel has been replaced with discharged on a **Thienopyridine inhibitor** (eg Clopidogrel and Prasugrel). There is a new field for discharged on an **Aldosterone antagonist** (eg Eplerenone and Spironolactone).

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

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)*

16 NICE guidance for secondary prevention

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

16.1 Smoking cessation advice given with the options

- 0. No*
- 1. Yes*
- 3. Not applicable*
- 9. Unknown*

16.2 Dietary advice given during this admission with the options

- 0. No*
- 1. Yes*
- 3. Planned in rehab*
- 4. Not applicable*

17 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.

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

18.1 Primary PCI

Patients having primary PCI for ST elevation infarction are increasingly 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 a web application will make linking of MINAP and BCIS records much easier, and will be available to those using the web application during the next 12 months.

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 with all the paperwork!

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 18.1.1. 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.
- An interventional centre performing primary PCI must make a MINAP record for every patient having primary PCI or activating the primary PCI pathway.

18.1.1 Interventional centres

A MINAP record must be completed for all patients transferred or admitted 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 from another hospital, Method of admission is *9. Transferred for PCI/surgery*.
- 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 becomes 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.
- 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 are listed below.

Demographics

Admission details

- Initial diagnosis
- Date/time arrival at interventional centre
- Method of admission
- Date/time of onset of symptoms/call for help
- Ambulance job number

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
- Patient case record at referring hospital 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 Section 18.1.4

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 after angiography it was decided not to proceed. Please enter these patients into MINAP using, in particular the interventional audit fields that explain why no procedure was performed.

18.1.2 Non interventional hospitals

There are two possible scenarios

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

There are several circumstances in which this might happen, but typically a patient might be admitted with chest pain and go on to develop 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 (new field)
 - Secondary prevention medication
 - Discharge date
 - Discharge destination

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*.

18.1.4 The patient comes to a non interventional hospital for the 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.

Start a MINAP record

- Date and time of admission is, of course, the date and time of arrival with you. As no measurements of this time are made enter 00:00. No other times are required
- Method of admission is *12. Inter-hospital transfer*
- 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 Method of Admission is correctly completed.
- Complete the following
 - Interventional centre code as the hospital 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 (new field)
 - 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)

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

As a rule any coronary intervention following thrombolytic treatment performed less than 24 hours after onset of symptoms of STEMI is a rescue procedure, and should be recorded as such. If in doubt ask your cardiologist.

CCAD uses the NHS number to link patient episodes together, but as an additional identifier please ensure that your hospital case record number is attached to any documentation that accompanies the patient to the interventional centre. This will be used as part of the identification process linking any information transferred back to you. This is vital if you have not provided the NHS number. Data entry should include as a minimum:

Demographics Usual data entry.

Admission details All these items should be completed.

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.
Referral hospital 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.

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

Angiography / intervention is a routine part of care for patients with all acute coronary syndromes There is no need for a new MINAP record to be started when transferred to the interventional centre as these patients should be recorded in the BCIS database.

18.3.1 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
Local intervention date
Discharge destination
Date of discharge

18.3.2 Patient having angio on site followed by transfer elsewhere for intervention

Referral date for original angio
Local angio date
Coronary angiography
Coronary intervention is 9. *Unknown*
Day case transfer or Discharge date
Discharge destination is 2. *Other hospital*
Interventional centre code

18.3.3. 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.

18.3.4 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 Do not enter this date as procedure will be performed in another hospital
Interventional centre code Must be entered.
Discharge destination is 2. *Other hospital*.
Discharge date.

19 A set of examples to help in understanding data collection requirements in specific circumstances

19.1 Definite acute myocardial infarction that receives thrombolytic treatment in hospital

DEMOGRAPHICS

All demographic data

ADMISSION DETAILS

All fields including

Initial diagnosis = 1. *Definite myocardial infarction*

Admission date/time

Method of admission

Date/time of onset of symptoms/call for help

Ambulance job number

Type of admitting consultant

Admission ward

Heart rate & systolic BP on admission

Where was aspirin given

Place first 12 lead ECG performed

REPERFUSION

Complete all fields including:

Initial reperfusion treatment = 1. *Thrombolytic treatment*

Where was initial reperfusion treatment given

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

Site of infarction on ECG

Thrombolytic drug

Date/time of reperfusion

Additional reperfusion treatment as appropriate

Enter times of events as accurately as possible, using ambulance record where available

TESTS

Cholesterol

Glucose

Haemoglobin

Creatinine

Were cardiac enzymes/markers elevated Confirm diagnosis by indicating raised troponin

Troponin peak value

PREVIOUS MEDICAL HISTORY

Complete these fields

THERAPY

Therapy in use prior to admission

Therapy given during admission

Management of hyperglycaemia

COMPLICATIONS

Bleeding complications

Re-infarction

INVESTIGATIONS/INTERVENTIONS

All relevant fields including

Procedures

Left ventricular ejection fraction

Non-invasive tests/therapy

DISCHARGE DETAILS

Discharge date

Discharge diagnosis

Discharge destination

Followed up by

Cardiological care during admission

Secondary prevention

19.2 Definite acute myocardial infarction, thrombolysed by paramedic.

DEMOGRAPHICS

All demographic data

ADMISSION DETAILS

As for previous example

REPERFUSION

Complete all fields including:

Initial reperfusion treatment = 1. *Thrombolytic treatment*

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

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

Site of infarction on ECG

Place first 12 lead ECG performed = 1. *Ambulance*

And complete as for 19.1

19.3 Definite acute myocardial infarction, eligible for thrombolytic treatment but there are ambulance procedural delays.

DEMOGRAPHICS

All demographic data

ADMISSION DETAILS

All fields including

Initial diagnosis = 1. *Definite myocardial infarction*

Place first 12 lead ECG performed = 1. *Ambulance*

REPERFUSION

Complete all fields including:

Initial reperfusion treatment = 1. *Thrombolytic treatment*

Delay before treatment = 8. *Ambulance procedural delay. See Section 7 for explanation.*

And complete as for 19.1

19.4 Ambulance ECG not diagnostic of ST elevation infarction but when ambulance arrives at hospital, definite myocardial infarction diagnosed.

DEMOGRAPHICS

All demographic data

ADMISSION DETAILS

All fields including

Initial diagnosis = 1. *Definite myocardial infarction*

REPERFUSION

Complete all fields including:

Initial reperfusion treatment = 1. *Thrombolytic treatment*

Where was initial reperfusion treatment given

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

Site of infarction on ECG

Place first 12 lead ECG performed = 1. *Ambulance*

Thrombolytic drug

Delay before treatment = 10. *Ambulance 12 lead ECG not diagnostic of STEMI*

Date/time of reperfusion

Additional reperfusion treatment as appropriate

Enter times of events as accurately as possible, using ambulance record where available. Patient will be included in Door to Needle and Call to Needle analyses.

And complete as for 19.1

19.5 Definite ST elevation infarction diagnosed in ambulance but ineligible for pre-hospital thrombolytic treatment under present JRCALC protocol for ambulance paramedics. Treatment given in hospital.

DEMOGRAPHICS

All demographic data

ADMISSION DETAILS

All fields including

Initial diagnosis = 1. Definite myocardial infarction

REPERFUSION

Complete all fields including:

Initial reperfusion treatment? = 1. Thrombolytic treatment

Where was initial reperfusion treatment given

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

Place first 12 lead ECG performed = 1. Ambulance

Thrombolytic drug

Delay before treatment = 12. Ambulance administrative delay (see Section 8 for explanation)

And complete as for 19.1

19.6 Definite ST elevation AMI with clear onset occurring 24 hours ago, patient now pain free.

DEMOGRAPHICS

All demographic data

ADMISSION DETAILS

Complete all fields including:

Initial diagnosis = 1. Definite myocardial infarction

REPERFUSION

Complete the following fields

Initial reperfusion treatment = 0. None

Reason reperfusion treatment not given = 2. Too late

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

And complete as for 19.1

19.7 Patient with stuttering presentation thought to be unstable angina with ischaemic ECG who turns out to have unexpected finding of elevated troponin. ECG abnormal but no ST elevation. Previous AMI.

DEMOGRAPHICS

All demographic data

ADMISSION DETAILS

All fields including

Initial diagnosis = 3. Acute coronary syndrome

REPERFUSION

Initial reperfusion treatment = 0. None

Reason reperfusion treatment not given = 1. Ineligible ECG

DISCHARGE DETAILS

Discharge date

Discharge diagnosis = 4. ACS troponin positive/nSTEMI

Discharge destination

Followed up by

Cardiological care during admission

Secondary prevention

19.8 Typical history of single episode of cardiac pain admitted within 3 hours of onset of symptoms with very abnormal ECG showing extensive deep ST depression. Troponin elevated x3 above threshold level.

DEMOGRAPHICS

All demographic data

ADMISSION DETAILS

All fields including

Initial diagnosis = 3. Acute coronary syndrome

REPERFUSION

Initial reperfusion treatment = 0. None

Reason reperfusion treatment not given = 1. Ineligible ECG

ECG determining treatment

DISCHARGE DETAILS

Discharge date

Discharge diagnosis = 4. Acute coronary syndrome (troponin positive)

Discharge destination

Followed up by

Cardiological care during admission

Secondary prevention

19.9 Cardiac (VF) arrest in ambulance, responds to DC shock and is stable on arrival at A&E. Has an inferior MI on ECG.

As for example 19.1 with addition of cardiac arrest fields in COMPLICATIONS.

Enter times of events as accurately as possible, using ambulance record where available.

REPERFUSION

Delay before treatment = 5. Cardiac arrest

COMPLICATIONS

Did the patient have a cardiac arrest, if so where = 3. After ambulance arrival

Date/time of first cardiac arrest

Presenting rhythm = 2. VF/pulseless VT

Outcome of arrest = as appropriate.

19.10 Cardiac arrest before ambulance arrival, resuscitation abandoned without achieving stable rhythm or output after 30 min in A&E. Diagnosis of acute myocardial infarction based on reported history of chest pain immediately prior to arrest. No 12 lead ECG available.

DEMOGRAPHICS

All demographic data. NHS number will need checking out later.

ADMISSION DETAILS

Initial diagnosis = 3. *Acute coronary syndrome*

Admission date/time

Method of admission

Ambulance job number

Admission ward = 6. *Died in A&E*

COMPLICATIONS

Cardiac arrest All fields

DISCHARGE DETAILS

Discharge diagnosis = 7. *Myocardial infarction (unconfirmed)* *

This should be entered regardless of what is entered on a death certificate, unless PM shows convincing proof of fresh acute MI, or another diagnosis.

* If, as an alternative scenario, an ECG was performed during a period of stable rhythm, and in the opinion of the clinicians this showed evidence of definite infarction (sometimes difficult to interpret after a period of hypoxia) then record **Discharge diagnosis** = 1. *Myocardial infarction (ST elevation)*.

19.11 Patient admitted after onset of chest pain. Non diagnostic abnormal ECG on admission. Pain continues, and subsequent ECG, 2 hours after arrival on CCU then shows typical acute ST elevation. Patient then given thrombolytic treatment.

As for definite MI (see 19.1) with the following variations

ADMISSION DETAILS

Initial diagnosis = 3. *Acute coronary syndrome*

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*

Additional reperfusion treatment as appropriate

NB this is the format for use whenever an ECG for which thrombolytic treatment was initially not appropriate evolves into one that is. These patients will not be analysed as part of your Door to Needle time, but the numbers falling into this group will be analysed. There is no field for timing of initial ECG. Analysis will recognise that thrombolytic treatment was delayed because of an initial ineligible ECG. And complete as for 19.1

19.12 Patient admitted with chest pain having some relation to position, and despite strong risk factors and an ECG absolutely typical of anterior infarction, receives a diagnosis of pericarditis, and is treated with non steroidal anti inflammatory medication. The true diagnosis is established on the post take ward round, more than 12 hours after onset of symptoms.

DEMOGRAPHICS

All demographic data

ADMISSION DETAILS

All fields including

Initial diagnosis = 5. *Other initial diagnosis*

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 out of hospital delays are available (eg from ambulance record) please enter.

If the incorrect diagnosis is noted in time to offer thrombolytic treatment, enter as follows;

Initial reperfusion treatment = 1. *Thrombolytic treatment*

Was there a delay before treatment = 7. *Hospital administrative failure*

And complete as for 19.1

19.13 Twenty four hours after admission the surgeons find that a suspected upper GI perforation is a full thickness anterior MI.

DEMOGRAPHICS

All demographic data

ADMISSION DETAILS

All fields including

Initial diagnosis = 5. *Other initial diagnosis*

Admission date/time = Time of original admission

Method of admission = 8. *Patient already in hospital*

Type of admitting consultant = 9. *Other*

Admission ward = 5. *Other*

REPERFUSION

Initial reperfusion treatment = 0. *None*

Reason reperfusion treatment not given = 2. *Too late*

ECG determining treatment to confirm the ECG appearance of definite AMI

And complete as for 19.1

NB Patients presenting to other non-medical wards such as these will be identified from Admission ward and Type of admitting consultant, and will not be used in analysis. It may be useful for you to log them. They often have a high in patient mortality, so that identification is important for mortality flagging.

19.14 A patient having a second infarction for which he was treated promptly with a lytic drug has a cardiac arrest on the third day after admission and dies despite full attempts at resuscitation.

As for definite AMI (see 19.1) with addition of:

COMPLICATIONS

Complete these fields:

Did the patient have a cardiac arrest (if so; where)

Date/time of first arrest

Presenting rhythm

Outcome of arrest? = 1. *No return of circulation*

Re-infarction

DISCHARGE DETAILS

All relevant fields including:

Discharge diagnosis

Death in hospital = 1. *From MI*

Discharge date = Date of death

Discharge destination = 4. *Death*

19.15 Definite infarction and admitted directly to an interventional centre for primary PCI and discharged home or to another hospital.

DEMOGRAPHICS

All demographic data

ADMISSION DETAILS

All fields including

- Initial diagnosis = 1. Definite myocardial infarction**
- Admission date/time**
- Method of admission**
- Date/time of onset of symptoms/call for help**
- Ambulance job number**
- Heart rate & systolic BP on admission**
- Where was aspirin given**
- Place first 12 lead ECG performed**

REPERFUSION

Complete all fields including:

- Initial reperfusion treatment = 2. Primary PCI in house**
- ECG determining treatment (to confirm ECG appearances of definite AMI)**
- Site of infarction**
- Date/time of reperfusion**

INTERVENTIONAL AUDIT

- Assessment at interventional centre**
- Intended reperfusion procedure**
- Procedure performed**
- Why no angiogram performed**
- Why no intervention performed**

TESTS

- Cholesterol**
- Glucose**
- Haemoglobin**
- Creatinine**
- Were cardiac enzymes/markers elevated** Confirm diagnosis by indicating raised troponin
- Troponin peak value**

PREVIOUS MEDICAL HISTORY

Complete these fields

THERAPY

- Therapy in use prior to admission**
- Therapy given during admission**
- Management of hyperglycaemia**

COMPLICATIONS

- Bleeding complications**
- Re-infarction**

INVESTIGATIONS/INTERVENTIONS

- LVEF**
- Non-invasive tests/therapy**

DISCHARGE DETAILS

- Discharge date**
- Discharge diagnosis = 1. Myocardial infarction (ST elevation)**
- Discharge destination = 1. Home or 2. Other hospital**
- Followed up by**
- Cardiological care during admission**
- Secondary prevention**

19.16 Patient admitted to non interventional hospital and develops ST elevation MI after admission – for which transferred for primary PCI.

Data entry at non interventional hospital; time may be short, but it essential to start a record.

DEMOGRAPHICS

All demographic data

ADMISSION DETAILS

Initial diagnosis = 3. *Acute coronary syndrome (did not have STE at admission)*

Admission date/time

Method of admission

REPERFUSION

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

ECG appearances

Site of infarction

INVESTIGATIONS/INTERVENTIONS

Interventional centre code

DISCHARGE DETAILS

Discharge date or

Daycase transfer date – if it is likely the patient will return

Discharge diagnosis

Discharge destination

The same record might then be completed if the patient returns after primary PCI.

19.17 Patient admitted to interventional centre with STE MI. Following primary PCI, patient returns to a non interventional hospital for further care.

Data entry at non interventional hospital

DEMOGRAPHICS

All demographic data

ADMISSION DETAILS

Initial diagnosis = 1. *Definite myocardial infarction* (this depends on the initial diagnosis at the **first** hospital, so if it was STE MI at the interventional hospital in this example, that is what is recorded)

Admission date/time

Method of admission = 12. *Interhospital transfer*

REPERFUSION

Site of infarction (only if of local interest)

TESTS

(Biochemistry etc., to be entered at local discretion)

PREVIOUS MEDICAL HISTORY

Complete these fields

THERAPY

Therapy in use prior to admission

Therapy given during admission

Management of hyperglycaemia

COMPLICATIONS

Bleeding complications (where this occurred within 24 h. of an intervention)

Re-infarction

INVESTIGATIONS/INTERVENTIONS

What procedure was performed at the interventional hospital?

Interventional centre code

DISCHARGE DETAILS

Discharge date

Discharge diagnosis

Discharge destination

Discharge medications

Follow up

19.18 Patient with STEMI has pre-hospital thrombolysis, is taken to non interventional hospital but transferred immediately to interventional centre for rescue PCI.

Data entry in interventional centre

DEMOGRAPHICS

All demographic data

ADMISSION DETAILS

All fields including

Initial diagnosis = 1. *Definite myocardial infarction*

Admission date/time at interventional centre

Method of admission = 9. *Transferred for PCI/surgery* (previously for journey to non interventional hospital)

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

Date/time of onset of symptoms/call for help from ambulance PRF

Heart rate & systolic BP on admission

Where was aspirin/other antiplatelet given

REPERFUSION

Complete all fields including:

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

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*

Enter times of events as accurately as possible, using ambulance record where available

INTERVENTIONAL AUDIT

Date/time 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

TESTS

Cholesterol

Glucose

Haemoglobin

Creatinine

Were cardiac enzymes/markers elevated Confirm diagnosis by indicating raised troponin

Troponin peak value

PREVIOUS MEDICAL HISTORY

Complete these fields

THERAPY

Therapy in use prior to admission

Therapy given during admission

Management of hyperglycaemia

COMPLICATIONS

Bleeding complications

Re-infarction

INVESTIGATIONS/INTERVENTIONS

LVEF

Non-invasive tests/therapy

DISCHARGE DETAILS

Discharge date

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

Discharge destination

Followed up by

Cardiological care during admission

Secondary prevention

The extent to which the record is completed will depend on how long the patient stays at the interventional hospital.

Appendix 1 Data completeness fields 2009/10

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

* replaces Discharged on Clopidogrel which is archived.

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. The records selected with a Discharge diagnosis of

- 2. Myocardial infarction (non ST elevation)
- 4. Acute coronary syndrome (troponin positive)

Appendix 2

MINAP Dataset Version 8.1 February 2009						
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			
1.09	Patient admin status				Code n1	N
		1	NHS			
		2	Private			
		3	Amenity	NHS patient but procedure carried out in private hospital.		
		4	Other	For use for prisoners, travellers and armed services who may have no NHS number.		
5	Visitor	For holidaymakers and other overseas visitors.				
1.10	Patient postcode				Id an8	Y
		9	Unknown			
1.11	GP/ PCT code			The national code for the practice of the patient's registered GP or PCT.	Code 6	Y
1.12	Patient ethnic group				Code n2	N
		1	White (British)			
		2	White (Irish)			
		3	White (other)			
		4	Mixed white/black Caribbean			

		5	Mixed white/black African			
		6	Mixed other			
		7	Indian			
		8	Pakistani			
		9	Bangladeshi			
		10	Other Asian			
		11	Black Caribbean			
		12	Black African			
		13	Black other			
		14	Chinese			
		15	Other ethnic group			
		99	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
		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.	
2.02	Method of admission				In every case the caller refers to the patient or other non professional in attendance.	Code n2
		1	Called GP who saw patient then called emergency services		Use also when patient sees GP at surgery or other health professional, includes drop in night time clinic and walk in centre.	
		2	Called GP who called emergency service then saw patient		In some instances the GP may not actually see the patient.	
		3	called 999			

		4	called NHS direct			
		5	Made own way to hospital (did not call anyone)			
		6	Called local helpline			
		7	Called GP, told to make own way to hospital			
		8	Patient already in 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.		
		9	Transferred for PCI/Surgery	A transfer from another hospital for primary or rescue PCI.		
		10	Transferred for initial treatment	A transfer from another hospital (including other hospitals within your Trust) for thrombolytic treatment, or continuing care after this has been given. Do not use where transfer is for intervention or surgery.		
		11	Other	To include other routes of entry to hospital (became ill visiting in hospital etc.)		
		12	Inter hospital transfer	For use on return of patient from interventional centre (usually following primary PCI or rescue).		
		99	Unknown			
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
		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 abnormality	All other abnormalities thought potentially relevant to this admission eg arrhythmias, conduction disturbances.		
		6	Normal ECG			
		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 enzymes/markers raised?			Enzyme or marker activity less than twice the upper limit of normal for the hospital laboratory on any sample. For troponin assays the decision should be made on presence/absence of elevation beyond the upper reference limit (upper limit of normal for the local assay).	Code n1	N
		0	No			
		1	Yes			
		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	A patient not known to be diabetic at the time of admission.		
		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.		

2.18	Previous PCI	9	Unknown	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	
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.		
		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.		

		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			
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 ddmmyyyy, 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 reperfusion treatment whether by bolus or infusion. For primary PCI use time of first balloon inflation. Balloon time is first device time (balloon, or stent or aspiration device etc) whether or not it establishes flow, but not guidewire (unless this establishes TIMI3 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
		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
		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
		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.	n3.2 [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			eg 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	0	No		Code n1	N
		1	Yes	Record yes if on treatment at admission and drug continued or introduced while in hospital.		
		9	Unknown			
3.28	IV nitrate	0	No		Code n1	N
		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.		

3.36	Thrombolytic drug	9	Unknown	The agent used for first thrombolytic treatment.	Code n1
		1	Streptokinase		
		2	Alteplase		
		3	Reteplase		
		4	Tenecteplase		
3.37	Troponin assay	9	Unknown	Troponin assay used.	Code n1
		1	Troponin I		
		2	Troponin T		
3.38	Fondaparinux	9	Unknown	Record if used while in hospital.	Code n1
		0	No		
		1	Yes		
3.39	Initial reperfusion treatment	9	Unknown	This refers to treatment given in your hospital.	Code n1
		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.	
3.40	Additional reperfusion treatment	9	Unknown	Further emergency reperfusion treatment where initial treatment may have failed.	Code n1
		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.
		5	Diet only			A low carbohydrate diet for diabetes.
		6	Not applicable			Patient not considered to be diabetic at discharge.
		9	Unknown			
3.43	Oral beta blocker		In hospital use.			
		0	No			
		1	Yes			
		9	Unknown			
3.44	Aldosterone antagonist		In hospital use, includes Eplerenone and Spironolactone.			
		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		Place of assessment after arrival at non interventional hospital.	Text		

	hospital	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.	
		7	Other		
		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, eg elective intervention for STEMI / nSTEMI or for new symptoms.	
		9	Unknown		
3.5	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				Text

	performed?	0	Not applicable	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.	
		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.	
		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	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.	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
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

		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	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	N
4.22	Patient case record number at referring hospital			Patient case record number at hospital from which the patient referred for further investigation/ treatment.	Id an10	N
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 arrangement for hospital follow up is made by the discharging hospital. Do not use when patient transferred elsewhere.		
		4	Not applicable	eg 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			eg 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.		
		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.		
		9	Unknown			
4.29	What procedure was performed at the interventional hospital?			For use by non interventional hospitals when patients return after an intervention.		
		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.	
		0	No		
		1	Yes		
		3	Not applicable		
		9	Unknown		
5.2	Dietary advice given during this admission			As documented in case record. NICE MI secondary prevention audit criteria.	
		0	No		
		1	Yes		
		3	Planned in rehab		
		4	Not applicable		