

## 2.2 Managing myocardial infarction

Position responsible: Medical Director  
Approved by: CGC

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Related Documents      Consent policy  
                                    SOP 2.1 Advanced life support

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Further information      None

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### 1.0 Background

- 1.1 For those patients suffering an acute myocardial infarction (AMI), it has been shown repeatedly that the time from onset of symptoms to undergoing therapy is a major determinant of mortality. Nearly half of potentially salvageable myocardium is lost within 1 hour of the coronary artery being occluded, and two-thirds are lost within 3 hours. National initiatives have aimed to provide primary percutaneous coronary intervention (PPCI) for acute ST-elevation MIs (STEMIs) – a more effective treatment than thrombolysis with improved outcomes and shorter hospital stays.
- 1.2 Medical Team members may be asked to attend a patient with an AMI or give advice to paramedics at the scene on suitability for PPCI or attend patients post cardiac arrest due to an AMI.

### 2.0 Recognising an acute MI

- 2.1 Patients usually present acutely with:
- A history and symptoms that are suggestive of ischaemic chest pain
  - 12 lead ECG showing acute changes consistent with acute myocardial infarction;
    - ST elevation of 2mm or more in 2 or more contiguous chest leads, or
    - ST elevation of 1mm in 2 or more contiguous limb leads, or
    - ST depression of 1mm or more in leads V1-3 with a dominant R wave (consistent with a posterior MI)
    - New onset left bundle branch block

### 3.0 Management

- 3.1 On confirmation of an AMI, the PPCI Checklist should be used to assess patients for their suitability for undergoing PPCI (see appendix 1). Those eligible meet the following criteria:-
- Proven to have an AMI on 12-lead ECG
  - Onset of pain/symptoms within 12hrs
  - NO absolute contra-indications to PPCI
  - Able to get to PPCI centre within 120minutes **from the time of the 999 call**

3.2 Whilst the checklist is being undertaken, all patients should have the following unless contraindicated:

- Oxygen (if SpO2 <94%)
- Aspirin 300mg (oral or rectal)
- GTN sublingual spray (not if intubated)

3.3 Patients may require opiates to ease the pain.

3.4 Patients will be monitored using a 3-lead ECG, non-invasive blood pressure and pulse oximeter.

#### **4.0 Eligible for PPCI**

4.1 Patients that are assessed as suitable for PPCI should receive:

- 180mg ticagrelor orally unless contraindicated (particularly on oral anticoagulants) or intubated

4.2 Arrangement is made with ambulance control to expedite transport of the patient to the nearest Heart Attack Centre. This can be usually undertaken by a paramedic crew without Medical Team escort.

4.3 It is unlikely that STEMI patients being conveyed to Heart Attack Centres will need to be conveyed by air. In many cases, secondary road transfer is required to reach the centre, often negating the time and safety advantages of air transfer. The main exceptions to this may be:

- STEMI patients in Suffolk, who require transfer to either Norwich, Papworth or Basildon
- Where the nearest Heart Attack Centre is unable to accept a patient on the basis of capacity or reduced service availability, requiring longer transfer times.

4.4 The Heart Attack Centre is called giving details of the patient and an estimated time of arrival.

4.5 This service is available at the following Heart Attack Centres 24/7:

1	Papworth	██████████
2	Norwich	██████████
3	Basildon CTC	██████████
4	Harefield	██████████
5	Lister	██████████
6	Kettering GH	██████████
7	Lincoln	██████████
8	Leicester Glenfield	██████████
9	Nottingham City	██████████

## 5.0 Patients not eligible for PPCI

- 5.1 Those patients that are not eligible for PPCI are also unlikely to be eligible for pre-hospital thrombolysis. If possible, they should all be given ticagrelor 180mg unless contraindicated.
- 5.2 If the patient will not arrive at a Heart Attack Centre within 120mins from the time of the 999 call, then pre-hospital thrombolysis can be considered. This would be unusual in our area and a discussion should be had with the PPCI Registrar or Consultant, as often a late PPCI will give better outcomes over thrombolysis.
- 5.3 The following are contraindications to the administration of thrombolysis. Points with an asterisk may be considered as relative contraindications:
- Active internal bleeding or uncontrollable external bleeding
  - Suspected aortic dissection
  - Uncontrolled blood pressure (systolic >200, diastolic >120mmHg)
  - Haemorrhagic stroke within the past 2 months
  - Recent head injury (2 weeks)
  - Active untreated diabetic haemorrhagic retinopathy
  - Intracranial neoplasms
  - Pregnancy \*
  - CPR > 5 minutes \*
  - Bleeding disorders \*
  - Anticoagulation or INR >1.8 \*
  - Recent surgery \*
- 5.4 If thrombolysis is indicated and there are no contraindications, the patient should be consented for thrombolysis. Verbal consent should be taken by the Doctor and recorded on the PRF as detailed in the Magpas Consent Policy.
- 5.4.1 Following consent, thrombolysis can be given with monitoring attached.
- 5.5 All patients who are thrombolysed in the community should be identified with a specific wrist band detailing name and treatment given.
- 5.6 The preferred thrombolytic is tenecteplase. Its dose is calculated based upon the estimated body weight of the patient and is given as a bolus over 10 seconds (see table) **preceded** by a bolus of heparin 5000IU.

Body weight	Tenecteplase dose (units)	Tenecteplase dose (mg)	Tenecteplase dose (ml of reconstituted solution)
<60	6000	30	6
60 – 70	7000	35	7
70 – 80	8000	40	8
80 – 90	9000	45	9
>90	10000	50	10

- 5.7 The most common side effects are reperfusion arrhythmias, hypotension, bleeding and stroke. These should be treated as clinically appropriate and the equipment for doing so should be readily available.

- 5.8 Patients should then be transported to the nearest Emergency Department by ambulance; this does not normally require the medical team to escort the patient, unless the crew composition is unable to continue providing paramedic-level care.

## **6.0 Cardiac arrest**

- 6.1 Those patients that present with symptoms of an AMI that then proceed to cardiac arrest should be resuscitated as per SOP 2.1 Adult Cardiac Life Support.
- 6.2 If the patient regains a pulse and spontaneous breathing AND meets the criteria for PPCI, they should continue to the Heart Attack Centre with a pre-alert. The team should escort these patients to the PPCI centre following the ROSC Care Bundle targets.
- 6.3 If the patient regains a pulse but either requires assistance with ventilation or is intubated, the patient should be discussed with the on-call cardiology registrar (via the Heart Attack Centre phone line) at the Heart Attack Centre. The availability of ITU beds is often the limiting factor and may require transport to a more distant Heart Attack Centre.

## **7.0 Performance and monitoring**

- 7.1 The aim is to reduce 'call to balloon' times as much as possible which has been shown to improve outcome. Delays at all stages should be reduced by the team.
- 7.2 There are occasions when the pathway does not meet the needs of the patient, eg refusal by the Heart Attack Centre of an intubated patient. These should be raised and monitored through the Magpas SER system.

