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Council of Cardiology Practice
European Society of Cardiology
Czech Society of Cardiology

Declaration of Interests

* No financial incentives
* Occasional lecturer for Sanofi,Servier,Boehringer Ingelheim, Bayer,Krka,Sandoz
* Chairman of the Working Group of Practicing Cardiologists of the Czech Society of Cardiology

Aim: To provide

- Homogenous
- Timely
- Effective

treatment of AMI/STEMI

*New AMI –STEMI Guidelines

* AMI – STEMI Guidelines

Homogenous acute care for AMI-STEMI patients preferably throughout Europe

How ?

European ECS /EACTS Guidelines and there endorsement through national societies

Standardized protocols for each part of the acute cardiac care

Adherence to Guidelines and protocols

Timely Care

How: Logistics

Effective Emergency Medical Systems

Sufficient network of PCI Centers

Awareness and knowledge of guidelines and protocols for all medical personnel involved as FMC /first medical contact/ and further acute care in the system, monitoring delays

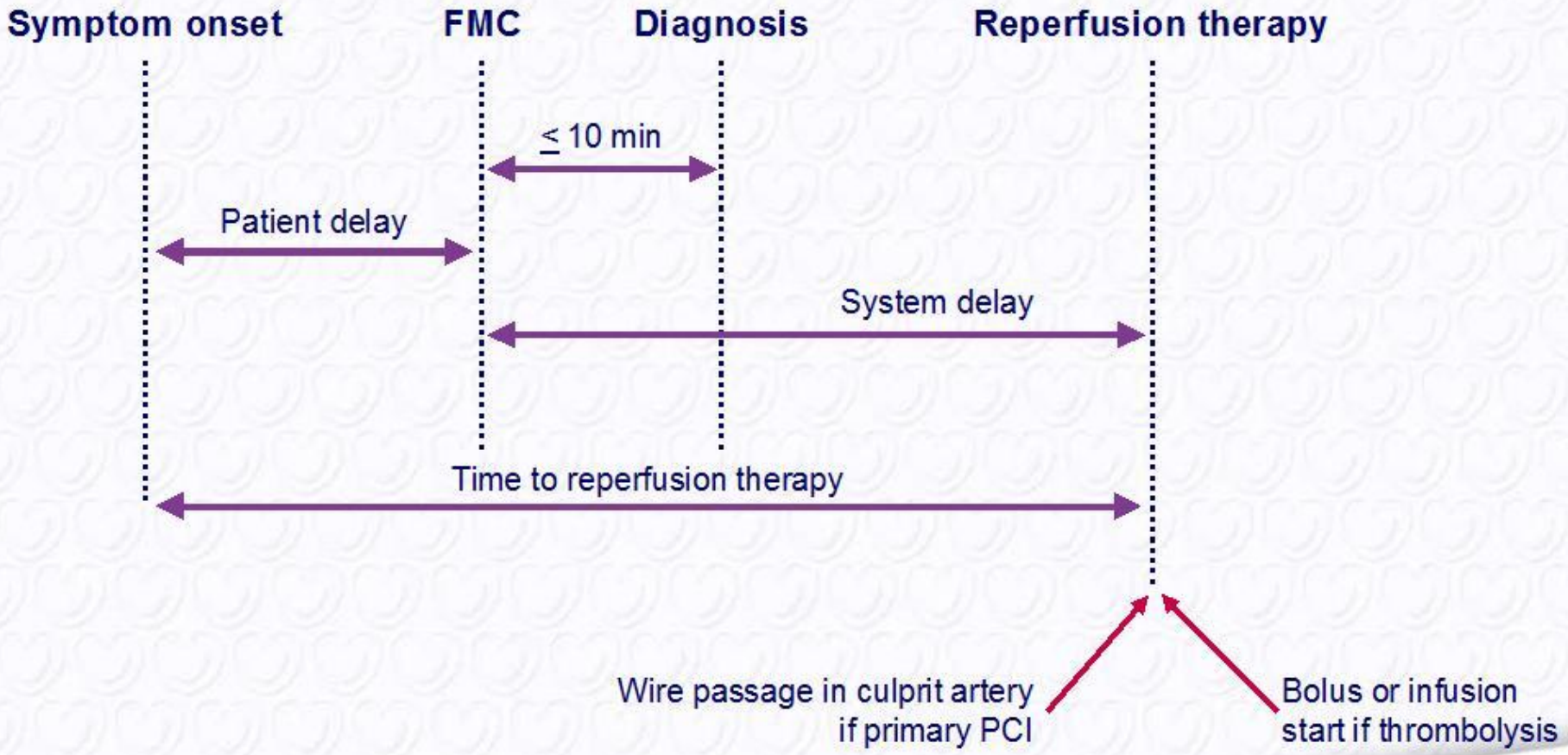
Public awareness and perception of the chest pain and Emergency Medical System contact

*AMI-STEMI Guidelines

*PCI Centers 2000

*PCI Centers 2006

Components of delay in STEMI and ideal time intervals for intervention



All delays are related to FMC (first medical contact)

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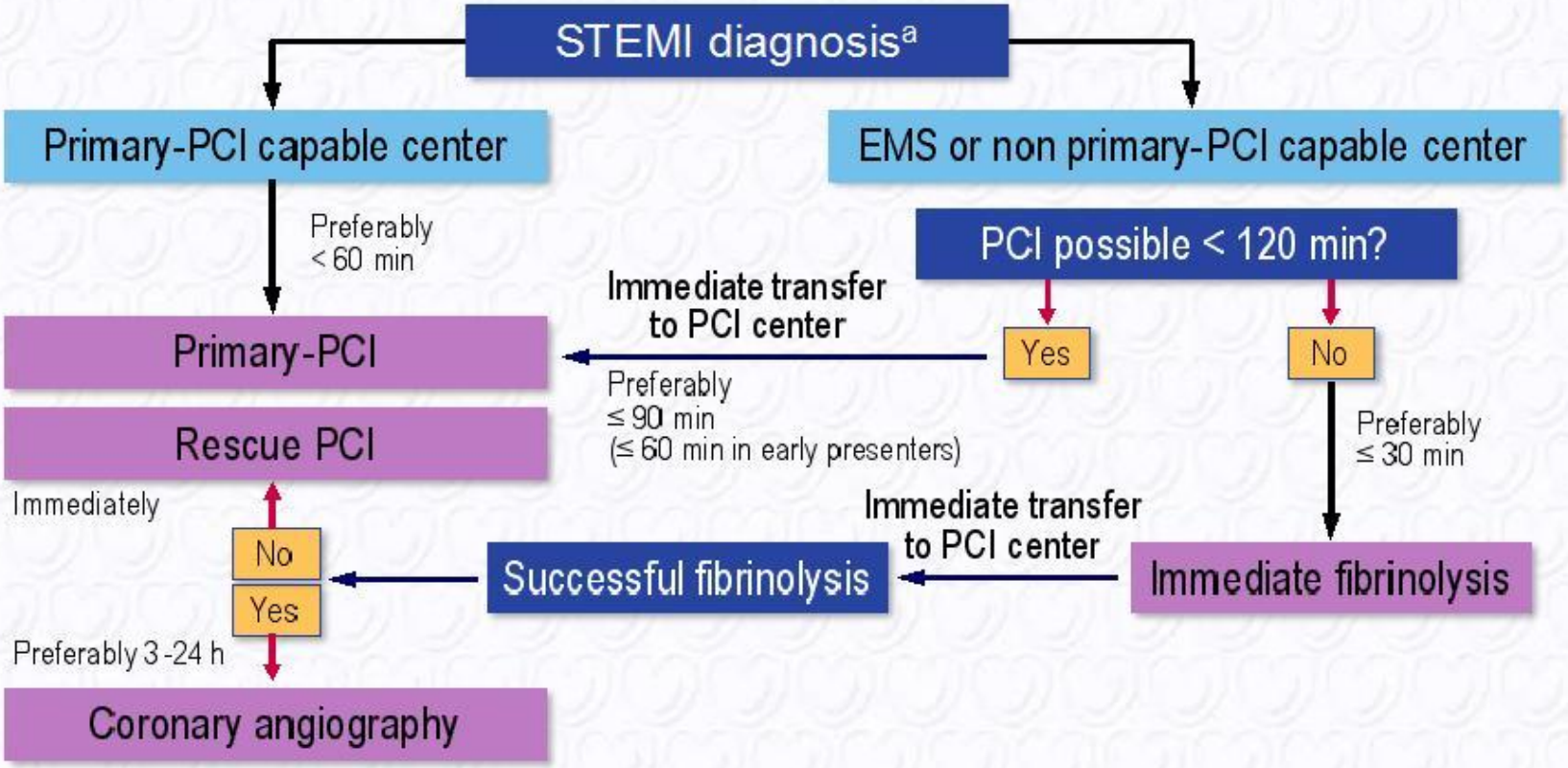
Prehospital and in-hospital management, and reperfusion strategies within 24 h of FMC



[a] The time point the diagnosis is confirmed with patient history and ECG ideally within 10 min from the first medical contact (FMC). All delays are related to FMC (first medical contact).

Cath = catheterization laboratory; EMS = emergency medical system; FMC = first medical contact; PCI = percutaneous coronary intervention; STEMI = ST-segment elevation myocardial infarction.

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www.escardio.org/guidelines

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Logistics of pre-hospital care

Recommendations	Class	Level
All hospitals and EMSs participating in the care of patients with STEMI must record and monitor delay times and work to achieve and maintain the following quality targets: – first medical contact to first ECG ≤ 10 min; – first medical contact to reperfusion therapy; • for fibrinolysis ≤ 30 min; • for primary PCI ≤ 90 min (≤ 60 min if the patient presents within 120 min of symptom onset or directly to a PCI-capable hospital).	I	B
All EMSs, emergency departments, and coronary care units must have a written updated STEMI management protocol, preferably shared within geographic networks.	I	C
Patients presenting to a non-PCI-capable hospital and awaiting transportation for primary or rescue PCI must be attended in an appropriately monitored area.	I	C
Patients transferred to a PCI-capable centre for primary PCI should bypass the emergency department and be transferred directly to the catheterization laboratory.	IIa	B

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Reperfusion therapy

Recommendations	Class	Level
Reperfusion therapy is indicated in all patients with symptoms of <12 h duration and persistent ST-segment elevation or (presumed) new LBBB.	I	A
Reperfusion therapy (preferably primary PCI) is indicated if there is evidence of ongoing ischaemia, even if symptoms may have started > 12 h beforehand or if pain and ECG changes have been stuttering.	I	C
Reperfusion therapy with primary PCI may be considered in stable patients presenting 12-24 h after symptom onset.	IIb	B
Routine PCI of a totally occluded artery > 24 h after symptom onset in stable patients without signs of ischaemia (regardless of whether fibrinolysis was given or not) is not recommended.	III	A

ECG = electrocardiogram; i.v. = intravenous; LBBB = left bundle branch block; PCI = percutaneous coronary intervention.

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*AMI-STEMI Guidelines

Effective reperfusion therapy:

PCI Centers working at 24h/7d basis

Experienced operators, radial access preference

Optimal treatment of the culprit lesion

Optimal anticoagulant and anti platelet therapy

Treatment of acute complications /HF, cardiogenic shock, arrhythmias, mechanical complications/

Procedural aspects of primary PCI

Recommendations	Class	Level
Procedural aspects of primary PCI		
Stenting is recommended (over balloon angioplasty alone) for primary PCI.	I	A
Primary PCI should be limited to the culprit vessel with the exception of cardiogenic shock and persistent ischaemia after PCI of the supposed culprit lesion.	IIa	B
If performed by an experienced radial operator, radial access should be preferred over femoral access.	IIa	B
If the patient has no contraindications to prolonged DAPT (indication for oral anticoagulation, or estimated high long-term bleeding risk) and is likely to be compliant, DES should be preferred over BMS.	IIa	A
Routine thrombus aspiration should be considered.	IIa	B
Routine use of distal protection devices is not recommended.	III	C
Routine use of IABP (in patients without shock) is not recommended.	III	A

BMS = bare-metal stent; DAPT = dual antiplatelet therapy; DES = drug-eluting stent; IABP = intra-aortic balloon pump; PCI = percutaneous coronary intervention.

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Periprocedural anti thrombotic medication in primary PCI

Recommendations	Class	Level
Antiplatelet therapy		
Aspirin oral or i.v. (if unable to swallow) is recommended	I	B
An ADP-receptor blocker is recommended in addition to aspirin. Options are:	I	A
• Prasugrel in clopidogrel-naive patients, if no history of prior stroke/TIA, age < 75 years.	I	B
• Ticagrelor.	I	B
• Clopidogrel, preferably when prasugrel or ticagrelor are either not available or contraindicated.	I	C

ADP = adenosine diphosphate.

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Periprocedural anti thrombotic medication in primary PCI, *con't*

Recommendations	Class	Level
GP IIb/IIIa inhibitors should be considered for bailout therapy if there is angiographic evidence of massive thrombus, slow or no-reflow or a thrombotic complication.	IIa	C
Routine use of a GP IIb/IIIa inhibitor as an adjunct to primary PCI performed with unfractionated heparin may be considered in patients without contraindications.	IIb	B
Upstream use of a GP IIb/IIIa inhibitor (vs. in-lab use) may be considered in high-risk patients undergoing transfer for primary PCI.	IIb	B
Options for GP IIb/IIIa inhibitors are (with LoE for each agent):		
• Abciximab		A
• Eptifibatide (with double bolus)		B
• Tirofiban (with a high bolus dose)		B

GP = glycoprotein; i.v. = intravenous; lab = catheterization laboratory.

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Periprocedural anti thrombotic medication in primary PCI, *con't*

Recommendations	Class	Level
Anticoagulants		
An injectable anticoagulant must be used in primary PCI.	I	C
Bivalirudin (with use of GP IIb/IIIa blocker restricted to bailout) is recommended over unfractionated heparin and a GP IIb/IIIa blocker.	I	B
Enoxaparin (with or without routine GP IIb/IIIa blocker) may be preferred over unfractionated heparin.	IIb	B
Unfractionated heparin with or without routine GP IIb/IIIa blocker must be used in patients not receiving bivalirudin or enoxaparin.	I	C
Fondaparinux is not recommended for primary PCI.	III	B
The use of fibrinolysis before planned primary PCI is not recommended.	III	A

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Special subsets

Recommendations	Class	Level
Both genders must be managed in a similar fashion.	I	C
A high index of suspicion for myocardial infarction must be maintained in women, diabetics, and elderly patients with atypical symptoms.	I	B
Special attention must be given to proper dosing of antithrombotics in elderly and renal failure patients.	I	B

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*AMI-STEMI Guidelines

In hospital management of patients after reperfusion:

CCU stay

Hospital stay and discharge

Early detection of LV dysfunction / echo/

Risk management /smoking, overweight, life style, eating habits, DM diagnosis and treatment/

Starting of long term medical therapy after STEMI

Logistical issues during hospital stay

Recommendations	Class	Level
All hospitals participating in the care of STEMI patients should have a coronary care unit equipped to provide all aspects of care for STEMI patients, including treatment of ischaemia, severe heart failure, arrhythmias and common comorbidities.	I	C
Length of stay in the coronary care unit		
Patients undergoing uncomplicated successful reperfusion therapy should be kept in the coronary care unit for a minimum of 24 h, after which they may be moved to a step-down monitored bed for another 24-48 h.	I	C
Transfer back to a referring non-PCI hospital		
Early transfer (same day) may be considered in selected, low-risk patients after successful primary PCI without observed arrhythmia.	IIb	C
Hospital discharge		
Early discharge (after approximately 72 h) is reasonable in selected low-risk patients, if early rehabilitation and adequate follow-up are arranged.	IIb	B

PCI = percutaneous coronary intervention; STEMI = ST-segment elevation myocardial infarction.

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Routine therapies in the acute, subacute and long term phase of STEMI

Recommendations	Class	Level
Active smokers with STEMI must receive counselling and be referred to a smoking cessation programme	I	B
Each hospital participating in the care of STEMI patients must have a smoking cessation protocol.	I	C
Exercise-based rehabilitation is recommended	I	B
Antiplatelet therapy with low dose aspirin (75-100 mg) is indicated indefinitely after STEMI.	I	A
In patients who are intolerant to aspirin, clopidogrel is indicated as an alternative to aspirin.	I	B
DAPT with a combination of aspirin and prasugrel or aspirin and ticagrelor is recommended (over aspirin and clopidogrel) in patients treated with PCI	I	A
DAPT with aspirin and an oral ADP receptor antagonist must be continued for up to 12 months after STEMI, with a strict minimum of:	I	C
• 1 month for patients receiving BMS;	I	C
• 6 months for patients receiving DES.	IIb	B

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Routine therapies in the acute, subacute and long term phase of STEMI

Recommendations	Class	Level
In patients with left ventricular thrombus, anticoagulation should be instituted for a minimum of 3 months.	IIa	B
In patients with a clear indication for oral anticoagulation (e.g. atrial fibrillation with CHA_2DS_2-VASc Score ≥ 2 or mechanical valve prosthesis), oral anticoagulation must be implemented in addition to antiplatelet therapy.	I	C
In patients require triple antithrombotic therapy, combining DAPT and OAC, e.g. because of stent placement and an obligatory indication for OAC, the duration of dual antiplatelet therapy should be minimized to reduce bleeding risk.	I	C
In selected patients who receive aspirin and clopidogrel, low-dose rivaroxaban (2.5 mg twice daily) may be considered if the patient is at low bleeding risk.	IIb	B
DAPT should be used up to 1 year in patients with STEMI who did not receive a stent.	IIa	C
Gastric protection with a proton pump inhibitor should be considered for the duration of DAPT therapy in patients at high risk of bleeding.	IIa	C

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Routine therapies in the acute, subacute and long term phase of STEMI

Recommendations	Class	Level
Oral treatment with beta-blockers should be considered during hospital stay and continued thereafter in all STEMI patients without contra-indications.	IIa	B
Oral treatment with beta-blockers is indicated in patients with heart failure or LV dysfunction.	I	A
Intravenous beta-blockers must be avoided in patients with hypotention or heart failure.	III	B
Intravenous beta-blockers should be considered as the time of presentation in patients without contraindications, with high blood pressure, tachycardia and no signs of heart failure.	IIa	B
A fasting lipid profile must be obtained in all STEMI patients, as soos as possible after presentation.	I	C
It is recommended to initiate or continue high dose statins early after admission in all STEMI patients without contraindication or history of intolerance, regardless of initial cholesterol values.	I	A

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Routine therapies in the acute, subacute and long term phase of STEMI

Recommendations	Class	Level
Reassessment of LDL-cholesterol should be considered after 4-6 weeks to ensure that a target value of ≤1.8 mmol/L (70 mg/dL) has been reached.	IIa	C
Verapamil may be considered for secondary prevention in patients with absolute contraindications to beta-blockers and no heart failure.	IIb	B
ACE Inhibitors are indicated starting within the first 24 h of STEMI in patients with evidence of heart failure, LV systolic dysfunction, diabetes or an anterior infarct.	I	A
An ARB, preferably valsartan, is an alternative to ACE inhibitors in patients with heart failure or LV systolic dysfunction, particularly those who are intolerant to ACE inhibitors.	I	B
ACE inhibitors should be considered in all patients in the absence of contraindications.	IIa	A
Aldosterone antagonists, e.g. eplerenone, are indicated in patients with an ejection fraction ≤ 40% and heart failure or diabetes, provided no renal failure or hyperkalaemia.	I	B

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Summary of novel aspects

- Importance of recognizing atypical ECG presentations.
- Immediate angiography with a view to PCI in survivors of cardiac arrest and STEMI or high suspicion of AMI.
- A delay of < 90 min from FMC to P-PCI is the target but a maximum of 120 min is acceptable for primary PCI rather than fibrinolysis.
- Delays must be recorded and monitored:
  - FMC to ECG: ≤ 10 min;
  - FMC to lysis: ≤ 30 min;
  - FMC to PPCI: ≤ 90 min (60 min in PCI hospitals or for early presenters).
- Primary PCI is indicated if there is evidence of ongoing ischaemia, even if symptoms may have started > 12 h.
- After fibrinolysis:
  - Transfer to a PCI-capable center is indicated in all patients;
  - Angio with a view to revascularization indicated after successful lysis (optimal timing 3-24 h).

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Summary of novel aspects

- DES preferred over BMS for P-PCI.
- Prasugrel or Ticagrelor preferred over clopidogrel as adjunct to ASA in P-PCI.
- DAPT is recommended for 12 months, with minimum of 1 for BMS, 6 for DES).
- Bivalirudin preferred as anticoagulant for P-PCI, or enoxaparin, over UFH.
- Routine use of GPIIb/IIIa blockers is downgraded in P-PCI.
- β-blockers downgraded after STEMI without CHF or LV dysfunction.
- Guidelines for managing hyperglycemia in the acute phase.

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Summary of novel aspects

- Special subsets are emphasized (gender, diabetes, renal failure).
- Minimal CCU (24 h) and hospital LOS (72 h), with early transfer possible.
- After the acute phase:
  - All pts should have an echocardiogram;
  - Stress testing or imaging for viability and ischemia is indicated in pts with MVD.
- High dose statins in all patients without contraindication or history of intolerance.
- LDL target of ≤ 1.8 mmol/L (0.7 g/dL).

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Major gaps in evidence

- Strategies to minimize early cardiac arrest.
- Improving patient and public awareness of STEMI symptoms.
- Optimizing clinical pathways for high-quality, homogeneous early STEMI diagnosis and management.
- Reducing or minimizing myocardial injury and left ventricular dysfunction following STEMI.
- Defining the optimal management strategy for non-culprit vessels in primary PCI patients.
- Defining the optimal long-term antithrombotic regimen in patients receiving stents and who have an indication for oral anticoagulants.
- Defining the role for pre-hospital thrombolysis in patients presenting early.

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Major gaps in evidence

- Defining the optimal combination and duration of antithrombotic therapies.
- Defining the optimal glucose-management goals and strategy in patients with known diabetes or acute hyperglycaemia.
- Developming percutaneous techniques for managing ventricular septal defects.
- Effective and safe of cell therapy to replace myocardium or minimize the consequences of myocardial injury.
- Strategy to minimize risk of sudden death in patients with ventricular tachycardia or ventricular fibrillation during or after STEMI.
- Effective strategies to achieve and maintain long-term effective risk factor control.

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