Η θέση της θρομβόλυσης σήμερα

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Επεμβατικός Καρδιολόγος
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Τζάνειο Γενικό Νοσοκομείο Πειραιά
• No disclosures
Total ischaemic time

Patient delay

EMS delay

System delay

FMC: EMS

<10'

STEMI diagnosis

Time to PCI?

≤120 min

Primary PCI strategy

<90'

Reperfusion (Wire crossing)

>120 min

Fibrinolysis strategy

<10'

Reperfusion (Lytic bolus)

FMC: Non-PCI centre

FMC: PCI centre

<10'

STEMI diagnosis

Primary PCI strategy

<60'

Reperfusion (Wire crossing)

Patient delay

System delay

Total ischaemic time

70 ΧΡΟΝΙΑ ΚΑΡΔΙΟΛΟΓΙΑΣ (ΕΚΕ)
70 YEARS OF CARDIOLOGY (HSC)

ΠΑΝΕΛΛΗΝΙΟ ΚΑΡΔΙΟΛΟΓΙΚΟ ΣΥΝΕΔΡΙΟ
PANHELLENIC CONGRESS OF CARDIOLOGY

WWW.HCS.GR
Reperfusion strategies in the infarct-related artery according to time from symptoms onset

Early phase of STEMI
0 Symptom onset
3 hours
12 hours

Primary PCI
IA

Fibrinolysis
(only if PCI cannot be performed within 120 min from STEMI diagnosis)

Primary PCI
IA

Fibrinolysis
(only if PCI cannot be performed within 120 min from STEMI diagnosis)
### Summary of important time targets (continued)

<table>
<thead>
<tr>
<th>Intervals</th>
<th>Time targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum time from STEMI diagnosis to bolus or infusion start of fibrinolysis in patients unable to meet primary PCI target times.</td>
<td>≤10 min</td>
</tr>
<tr>
<td>Time delay from start of fibrinolysis to evaluation of its efficacy (success or failure).</td>
<td>60-90 min</td>
</tr>
<tr>
<td>Time delay from start of fibrinolysis to angiography (if fibrinolysis is successful).</td>
<td>2-24 hours</td>
</tr>
</tbody>
</table>
Fibrinolytic therapy

In hospital mortality (%)

Door-to-drug time (min)

N=85,589
P<0.0001

0-30: 7
31-60: 9.3
61-90: 11.9
>90: 16
# Fibrinolytic therapy

**Recommendations**

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Class</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>When fibrinolysis is the reperfusion strategy, it is recommended to initiate this treatment as soon as possible after STEMI diagnosis, preferably in the prehospital setting.</td>
<td>I</td>
<td>A</td>
</tr>
<tr>
<td>A fibrin-specific agent (i.e. tenecteplase, alteplase, reteplase) is recommended.</td>
<td>I</td>
<td>B</td>
</tr>
<tr>
<td>A half-dose of tenecteplase should be considered in patients ≥75 years of age.</td>
<td>IIa</td>
<td>B</td>
</tr>
</tbody>
</table>

**Antiplatelet co-therapy with fibrinolysis**

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Class</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral or i.v. aspirin is indicated.</td>
<td>I</td>
<td>B</td>
</tr>
<tr>
<td>Clopidogrel is indicated in addition to aspirin.</td>
<td>I</td>
<td>A</td>
</tr>
<tr>
<td>DAPT (in the form of aspirin plus a P2Y₁₂ inhibitor) is indicated for up to 1 year in patients undergoing fibrinolysis and subsequent PCI.</td>
<td>I</td>
<td>C</td>
</tr>
</tbody>
</table>
The TREAT study:⁴

Multinational*, open-label, randomized, Phase III trial to assess safety and efficacy of ticagrelor vs clopidogrel in patients aged 18–75 years, diagnosed with STEMI ≤24 hours prior to randomization, with documented cardiac ischaemic symptoms due to atherosclerosis >10 minutes duration at rest and treated with pharmacological thrombolysis (N=3799)

**Ticagrelor (N=1913)**
- 180 mg LD
- then 90 mg bid maintenance

**Clopidogrel (N=1886)**
- 300–600 mg LD
- then 75 mg qd maintenance

**Primary safety endpoint:** Time to TIMI-defined first major bleeding at **30 days**

**Secondary safety endpoints:** PLATO major bleeding and BARC categories 3–5 bleeding; ICH; fatal bleeding

**Secondary efficacy endpoints:** Composite of death from vascular causes, MI or stroke; composite of death from vascular causes, MI, stroke, recurrent ischaemia, TIA or other arterial events; individual components of these composites; all-cause mortality
Authors’ comments and conclusions

- In STEMI patients <75 years old treated with fibrinolytic therapy, ticagrelor was non-inferior to clopidogrel for major bleeding at 30 days\(^1\)

- Importantly, rates of fatal and intracranial bleeding were similar between ticagrelor and clopidogrel; however rates of minor, minimal and total bleeding events were numerically higher with ticagrelor\(^1\)

- The results of TREAT are consistent with smaller trials exploring ticagrelor use in patients receiving fibrinolytic therapy\(^2\)–\(^4\)

- Given that current STEMI guidelines recommend ticagrelor should only be initiated after 48 hours following fibrinolysis\(^5\), this trial adds new and important information to practicing physicians

- The majority of patients received clopidogrel pre-randomization, and based on the results, STEMI patients aged <75 years who initially receive clopidogrel can be safely switched to ticagrelor in the first 24 hours after fibrinolysis
**Fibrinolytic therapy (continued)**

<table>
<thead>
<tr>
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<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Interventions following fibrinolysis</strong></td>
<td></td>
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<tr>
<td>Emergency angiography and PCI if indicated is recommended in patients with heart failure/shock.</td>
<td>I</td>
<td>A</td>
</tr>
<tr>
<td>Rescue PCI is indicated immediately when fibrinolysis has failed (&lt; 50% ST-segment resolution at 60-90 min) or at any time in the presence of haemodynamic or electrical instability, or worsening ischaemia.</td>
<td>I</td>
<td>A</td>
</tr>
<tr>
<td>Angiography and PCI of the IRA, if indicated, is recommended between 2 and 24 hours after successful fibrinolysis.</td>
<td>I</td>
<td>A</td>
</tr>
<tr>
<td>Emergency angiography and PCI if needed is indicated in the case of recurrent ischaemia or evidence of reocclusion after initial successful fibrinolysis.</td>
<td>I</td>
<td>B</td>
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</table>
# Doses of fibrinolytic agents and antithrombotic co-therapies

<table>
<thead>
<tr>
<th>Drug</th>
<th>Initial treatment</th>
<th>Specific contra-indications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doses of fibrinolytic therapy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Streptokinase</td>
<td>1.5 million units over 30–60 min i.v.</td>
<td>Previous treatment with streptokinase or anistreplase</td>
</tr>
<tr>
<td>Alteplase (tPA)</td>
<td>15 mg i.v. bolus 0.75 mg/kg i.v. over 30 min (up to 50 mg) then 0.5 mg/kg i.v. over 60 min (up to 35 mg)</td>
<td></td>
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<tr>
<td>Retepase (rPA)</td>
<td>10 units + 10 units i.v. bolus given 30 min apart</td>
<td></td>
</tr>
<tr>
<td>Tenecteplase (TNK-tPA)</td>
<td>Single i.v. bolus: 30 mg (6000 IU) if &lt;60 kg 35 mg (7000 IU) if 60 to &lt;70 kg 40 mg (8000 IU) if 70 to &lt;80 kg 45 mg (9000 IU) if 80 to &lt;90 kg 50 mg (10000 IU) if ≥90 kg It is recommended to reduce to half-dose in patients ≥75 years of age.</td>
<td></td>
</tr>
<tr>
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<td>-----------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td><strong>Doses of antiplatelet co-therapies</strong></td>
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<tr>
<td>Aspirin</td>
<td>Starting dose of 150–300 mg orally (or 75–250 mg intravenously if oral ingestion is not possible), followed by a maintenance dose of 75–100 mg/day</td>
<td></td>
</tr>
<tr>
<td>Clopidogrel</td>
<td>Loading dose of 300 mg orally, followed by a maintenance dose of 75 mg/day. In patients ≥75 years of age: loading dose of 75 mg, followed by a maintenance dose of 75 mg/day.</td>
<td></td>
</tr>
</tbody>
</table>
### Doses of fibrinolytic agents and antithrombotic co-therapies (continued)

<table>
<thead>
<tr>
<th>Drug</th>
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<th>Specific contra-indications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Doses of anticoagulant co-therapies</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enoxaparin</td>
<td>In patients &lt;75 years of age: 30 mg i.v. bolus followed 15 min later by 1 mg/kg s.c. every 12 hours until revascularization or hospital discharge for a maximum of 8 days. The first two s.c. doses should not exceed 100 mg per injection.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>In patients ≥75 years of age: no i.v. bolus; start with first s.c. dose of 0.75 mg/kg with a maximum of 75 mg per injection for the first two s.c. doses. In patients with eGFR &lt;30 mL/min/1.73 m², regardless of age, the s.c. doses are given once every 24 hours.</td>
<td></td>
</tr>
</tbody>
</table>
# Doses of fibrinolytic agents and antithrombotic co-therapies (continued)

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</tr>
</thead>
<tbody>
<tr>
<td>UFH</td>
<td>60 IU/kg i.v. bolus with a maximum of 4000 IU followed by an i.v. infusion of 12 IU/kg with a maximum of 1000 IU/hour for 24-48 hours. Target aPTT: 50-70 s or 1.5 to 2.0 times that of control to be monitored at 3, 6, 12 and 24 hours.</td>
<td></td>
</tr>
<tr>
<td>Fondaparinux (only with streptokinase)</td>
<td>2.5 mg i.v. bolus followed by a s.c. dose of 2.5 mg once daily up to 8 days or hospital discharge.</td>
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</tbody>
</table>
### Contra-indications to fibrinolytic therapy

#### Absolute

- Previous intracranial haemorrhage or stroke of unknown origin at anytime.
- Ischaemic stroke in the preceding 6 months.
- Central nervous system damage or neoplasms or arteriovenous malformation.
- Recent major trauma/surgery/head injury (within the preceding month).
- Gastrointestinal bleeding within the past month.
- Known bleeding disorder (excluding menses).
- Aortic dissection.
- Non-compressible punctures in the past 24 hours (e.g., liver biopsy, lumbar puncture).

#### Relative

- Transient ischaemic attack in the preceding 6 months.
- Oral anticoagulant therapy.
- Pregnancy or within 1 week post partum.
- Refractory hypertension (SBP > 180 mmHg and/or DBP > 110 mmHg).
- Advanced liver disease.
- Infective endocarditis.
- Active peptic ulcer.
- Prolonged or traumatic resuscitation.
Due to the difficult topography of the country, the project is not completed yet. For example, we have to organize the STEMI care in the numerous small islands (pharmacoinvasive approach), we have to find the most suitable approach for the registry (permanent registry or fast track) and to organize the pre-hospital diagnosis and triage.
2η ΥΠΕ ΠΕΙΡΑΙΩΣ & ΑΙΓΑΙΟΥ

- ΚΕΝΤΡΟ ΥΓΕΙΑΣ ΣΑΛΑΜΙΝΑΣ
- ΚΕΝΤΡΟ ΥΓΕΙΑΣ ΑΙΓΙΝΑΣ
- ΚΕΝΤΡΟ ΥΓΕΙΑΣ ΓΑΛΑΤΑ
- ΚΕΝΤΡΟ ΥΓΕΙΑΣ ΚΑΡΠΑΘΟΥ
- ΚΕΝΤΡΟ ΥΓΕΙΑΣ ΠΑΤΜΟΥ
- ΚΕΝΤΡΟ ΥΓΕΙΑΣ ΧΩΡΑΣ ΑΜΟΡΓΟΥ
- ΚΕΝΤΡΟ ΥΓΕΙΑΣ ΑΝΔΡΟΥ
- ΚΕΝΤΡΟ ΥΓΕΙΑΣ ΘΗΡΑΣ
- ΚΕΝΤΡΟ ΥΓΕΙΑΣ ΙΟΥ
- ΚΕΝΤΡΟ ΥΓΕΙΑΣ ΜΗΛΟΥ
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- ΚΕΝΤΡΟ ΥΓΕΙΑΣ ΤΗΝΟΥ
- ΚΕΝΤΡΟ ΥΓΕΙΑΣ ΠΑΡΟΥ
Support for this may be given by CCU staff/Chest Pain Nurses depending on the patients location.

Transfer the patient with resuscitation equipment to CCU immediately AFTER thrombolysis is administered.

6.3 Thrombolysis for patients in the Isles of Scilly

- Tenecteplase and Enoxaparin are kept at the hospital on St. Marys and are readily accessible by the paramedics there.
- It is considered unlikely that patients presenting with an acute STEMI in the Isles of Scilly will be able to undergo primary PCI within 120 minutes from the time that thrombolysis can be given. It will also be difficult to achieve a `call to balloon time` of 150 minutes.
- For this reason, unless helicopter transfer direct to Treliske is available immediately, thrombolysis remains the treatment of choice for these patients who should then be transferred urgently to the Royal Cornwall Hospital for their on-going care.
Salvage index (% of initial area at risk)

- Time-dependent myocardial salvage
- Moderately time-dependent myocardial salvage
- Less or no time-dependent myocardial salvage

Thrombolysis
- (+++) Primary PCI
- (++) Primary PCI
- (+/-) Primary PCI
- (-) Primary PCI

15 min 40 min 2 h 6 h 12 h >12 h