ESC 2015 NSTE-ACS Guidelines
Diagnosis & Risk stratification

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Disclosures

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- University Hospital Basel

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2015 ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation

Task Force for the Management of Acute Coronary Syndromes in Patients Presenting without Persistent ST-Segment Elevation of the European Society of Cardiology (ESC)

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Diagnosis + Risk Stratification

1) Question
2) Case
3) Guidelines
Q1: Can an expert cardiologist in private practice accurately diagnose AMI?

1) Yes, of course!
2) No!
Q2: Can an expert cardiologist in private practice safely rule-out AMI?

1) Yes, of course!
2) No!
**Presentation:** In the morning (>6h ago) dyspnea + chest pain, 30min, no radiation, no sweating
Never angina during exercise
Asymptomatic at presentation to ED

**History:** stopped anti hypertensive therapy years ago, no other medical history

**cvRF:** hypertension, former smoking (20 py)

**Vitals:** BP 190/95mmHg, Puls 80/min, Oxy 98%
Lab results:

<table>
<thead>
<tr>
<th></th>
<th>0 h</th>
<th>6 h</th>
</tr>
</thead>
<tbody>
<tr>
<td>TnT4 [&lt;=0.01ug/L]</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>CK</td>
<td>136 U/L</td>
<td>107 U/L</td>
</tr>
<tr>
<td>CK-MB</td>
<td>4.4</td>
<td>4.2</td>
</tr>
</tbody>
</table>

Completely asymptomatic during 7h in the ED
Normal 2nd ECG
D-dimers negative
Chest x-ray normal
Same Patient presenting 4 (!) days later
Acute chest pain radiating in his left arm and back

STEMI!!!!!
Hs-cTn at initial presentation 4 days ago:

<table>
<thead>
<tr>
<th></th>
<th>Study blood examination</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 h</td>
</tr>
<tr>
<td>TnT4 (&lt;0.01 ug/L)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>CK</td>
<td>136 U/L</td>
</tr>
<tr>
<td>CK-MB</td>
<td>4.4</td>
</tr>
<tr>
<td>s-cTnl (Ref. 40 ng/L)</td>
<td>16 ng/L</td>
</tr>
<tr>
<td>hs-cTnl (Ref. 9 ng/L)</td>
<td>18 ng/L</td>
</tr>
<tr>
<td>hs-cTnT (Ref. 14 ng/L)</td>
<td>11 ng/L</td>
</tr>
</tbody>
</table>

(H)s-cTn improve the early rule-in of AMI
Chest Pain

ED/CPU
ECG Monitoring

Benign
Musculoskeletal, Anxiety, Pleuritis, Pericarditis, GERD, Gastritis

Out-patient

Acute life-threatening
AMI
Aortic dissection
Pulmonary embolism

PCI
The choice of the antithrombotic regimen should be based on selected management strategy as well as the chosen revascularisation modality.

- Dosing of antithrombotics should take into account age and renal function.
- Aspirin and parenteral anticoagulation are recommended.
- In conservative strategy without high bleeding risk, ticagrelor (preferred over clopidogrel) is recommended once the NSTEMI is established.
- The optimal timing for ticagrelor (preferred over clopidogrel) initiation in an invasive strategy has not been adequately investigated, while prasugrel is recommended only after coronary angiography prior to PCI.

### Diagram:

**Initial Assessment**

#### 1. Presentation

**Vital signs**

#### 2. ECG

- previous ECG
- $V_{7-9}$, $V_{3R}$ $V_{4R}$
- 2n ECG

#### 3. Troponin

*as a quantitative variable*

#### 4. Diagnosis

- Noncardiac
- UA
- Other Cardiac
- NSTEMI
- STEMI

**Legend:**

- **STEMI** = ST-elevation myocardial infarction
- **NSTEMI** = non-ST-elevation myocardial infarction
- **UA** = unstable angina
## Unstable angina vs NSTEMI

<table>
<thead>
<tr>
<th></th>
<th>UA</th>
<th>NSTEMI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute cardiomyocyte necrosis</td>
<td>-</td>
<td>+++</td>
</tr>
<tr>
<td>Risk of death/major arrhythmias</td>
<td>-/+</td>
<td>+++</td>
</tr>
<tr>
<td>Benefit from</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- intensified antiplatlet therapy</td>
<td>-/+</td>
<td>+++</td>
</tr>
<tr>
<td>- from early revascularization</td>
<td>-/+</td>
<td>+++</td>
</tr>
</tbody>
</table>
Time is critical in the ED

1. Rule-in
2. Rule-out

0h  1h  2h  3h  4h  5h  6h  7h

ECG
cTn
cTn
cTn

ESC 2011:  hs-cTn  hs-cTn

0h/1h-Algo:  hs-cTn
hs-cTn
Cave: Point of Care!
Hs-cTn: 0h/3h-algorithm

Acute Chest Pain

hsTn <ULN

- Pain >6h

hsTn no change

- Painfree, GRACE <140, differential diagnoses excluded

Discharge/ Stress testing

hsTn >ULN

- Pain <6h

Re-test hsTn: 3h

- Δ change (1 value >ULN)

Highly abnormal hsTn + clinical presentation

Invasive management

- Work-up differential diagnoses

hsTn no change

- Work-up differential diagnoses
Hs-cTn: 0h/1h-algorithm

0h hs-cTn + Δ0-1h > 0h hs-cTn

*if CPO>3h
**Hs-cTn: 0h/1h-algorithm**

*if CPO>3h*

**Suspected NSTEMI**

- **0h < A ng/l**
  - and **Δ0-1h < C ng/l**
  - **Rule-out**
- **0h < B ng/l**
  - **Observe**
- **0h ≥ D ng/l**
  - or **Δ0-1h ≥ E ng/l**
  - **Rule-in**

<table>
<thead>
<tr>
<th>Test Type</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hs-cTnT (Elecsys)</td>
<td>5</td>
<td>12</td>
<td>3</td>
<td>52</td>
<td>5</td>
</tr>
<tr>
<td>Hs-cTnT (Architect)</td>
<td>2</td>
<td>5</td>
<td>2</td>
<td>52</td>
<td>6</td>
</tr>
<tr>
<td>Hs-cTnI (Dimension Vista)</td>
<td>0.5</td>
<td>5</td>
<td>2</td>
<td>107</td>
<td>19</td>
</tr>
<tr>
<td>Recommendations</td>
<td>Class</td>
<td>Level</td>
<td></td>
<td></td>
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<td>--------------------------------------------------------------------------------</td>
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<tr>
<td><strong>Diagnosis and risk stratification</strong></td>
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<tr>
<td>It is recommended to base diagnosis and initial short-term ischaemic and bleeding risk stratification on a combination of clinical history, symptoms, vital signs, other physical findings, ECG and laboratory results.</td>
<td>I</td>
<td>A</td>
<td></td>
<td></td>
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<tr>
<td>It is recommended to obtain a 12-lead ECG within 10 min after first medical contact and to have it immediately interpreted by an experienced physician. It is recommended to obtain an additional 12-lead ECG in case of recurrent symptoms or diagnostic uncertainty.</td>
<td>I</td>
<td>B</td>
<td></td>
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</tr>
<tr>
<td>Additional ECG leads ($V_{3R}, V_{4R}, V_7-V_9$) are recommended if ongoing ischaemia is suspected when standard leads are inconclusive.</td>
<td>I</td>
<td>C</td>
<td></td>
<td></td>
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<tr>
<td>It is recommended to measure cardiac troponins with sensitive or high-sensitivity assays and obtain the results within 60 minutes.</td>
<td>I</td>
<td>A</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>A rapid rule-out protocol at 0h and 3h is recommended if high-sensitivity cardiac troponin tests are available.</td>
<td>I</td>
<td>B</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>A rapid rule-out and rule-in protocol at 0h and 1h is recommended if a high-sensitivity cardiac troponin test with a validated 0h/1h algorithm is available. Additional testing after 3–6h is indicated if the first two troponin measurements are not conclusive and the clinical condition is still suggestive of ACS.</td>
<td>I</td>
<td>B</td>
<td></td>
<td></td>
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