# Heart failure and troponin

<table>
<thead>
<tr>
<th>Condition</th>
<th>% trop raised</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe but stable HF</td>
<td>3%</td>
</tr>
<tr>
<td>Hospitalised HF</td>
<td>7%</td>
</tr>
<tr>
<td>Unstable HF</td>
<td>23%</td>
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<tr>
<td>APO</td>
<td>20-55%</td>
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</tbody>
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Pulmonary Edema Kaplan-Meier Survival Curves

Three-year Kaplan-Meier curves for group 1 versus group 2 patients

Case

- 39yo woman
- 2/52 post op
- Chest pain and dyspnoea
- ECG follows
- cTnT 0.45 (normal<0.03)
PR 166. Vertical axis, unusual for age. QRS axis 81 to 90 & age > 40
QRS 69. Consider Anterior infarct. Q wave in V3
QT 256. Nonspecific Inferior T abnormalities. T neg or T/QRS ratio <.05 2,3,F
QTc 365

- ABNORMAL ECG -

P 70
QRS 88
T -68

PRELIMINARY-MD MUST REVIEW
Pulmonary embolus and troponin

• ECG changes and troponin rises are common with large PEs

• This can cause diagnostic confusion

• Raised troponin has adverse prognostic significance
• ↑ troponin implies cardiac strain, thus is on some algorithms to determine need for echo +/- thrombolysis

• Typically rise lasts 48-72hrs.
  No evidence of cardiac damage down the track

**Bottom line:**
Unlikely to change management
Case

- 39yo bloke, ESRF on home dialysis
- Cough, dyspnoea and fever
- RR 40, bilateral crackles
- CXR follows
- ECG sinus tachy, otherwise normal
- Troponin T 0.15 (<0.03 normal)
- Urea 36.1 creatinine 1603
Is this APO triggered by an infarct?

Progress

• He gets better with fluid removal and antibiotics
• Serial troponins vary <20%
• I.e. no infarct
Renal failure and troponin

- cTnT commonly elevated in ESRF
- ?impaired clearance of troponin fragments

*But*..
- Predicts poorer prognosis
- ?accelerated apotosis

*Clinically*..
- ???
• Unclear what GFRs can be blamed for a troponin rise

• MI characterised by rise and fall of troponin, a change of greater than 20% in serial measurements said to be significant.
Case  .blunt cardiac injury

• 20yo, chest v’s steering wheel
• Bruised and ? #sternum, otherwise okay
• ECG normal
• Will troponin testing exclude a myocardial contusion?
Clinical bottom line

- If patient well and ECG normal little point in troponin testing.
- Negative troponin at 4-6hrs excludes BCI.
- If troponin >10X upper limit, echo likely to be abnormal.
- Low range elevations have useless specificity and sensitivity.
Marathon running

• 30-50% of marathoners will have a trop rise
• Some have done dozens of races without any evidence of cardiac injury
• Implication? ..probably reversible injury
Other stress related troponin rises

- Irukanji envenomation, probably due to massive catecholamine release
- Septic shock/ profound hypotension
- Tako-tsubo cardiomyopathy
- Hypertensive crisis
- Neurological catastrophes
Non infarct troponin rises behave differently

- Mostly < 10X upper limit
- Mostly relatively transient (2-3 days versus 7-10 days)
- But small MIs can do this also
- Still room for clinical judgement
Lab error

- Heterophile antibodies
- Mouse antibodies
- Excess fibrin
- Rheumatoid factor
The next generation tests

- Troponin positivity will occur earlier in ACS
- Est. 6% more positives in ACS
- Many other modest troponin rises detected in a host of conditions
- May alter management of some chronic conditions