Topic Overview: Cardiac Module

Sub-Module: C2 – Cardiac Chest Pain. The initial Assessment and Management

(Last Updated July 30 2012)

This handout is designed to partner the topic overview simulation session C2 – Cardiac Chest Pain- The initial assessment and management. This session involves a presentation followed by a team based pause-and-discuss simulation scenario. Use this document to jog your memory or to aid in your reflection of the session, and in particular the simulation.

This session involves learning together, as a team. Learning and training within teams that you work with helps that team to function more efficiently and effectively. It also allows members of that team to function well within other teams and groups, the goals and principles are the same. This type of experience and learning allows you to learn from each other, explore different perspectives and to understand the importance of all members of a team.

We are targeting "higher level learning". This is the application of skills and knowledge within a contextualised event to, hopefully, improve performance and practice. Learning is further encouraged through discussion and also working through simulated scenarios as a team. This session is also designed to allow you to put into practice knowledge and skills attained from other learning environments (the associated eLearning, other EdWISE simulation sessions, clinical placements, etc.).

As clinicians we should be constantly reviewing our own practices and looking for current best practice standards. During the feedback sessions we will facilitate this reflection but we would also encourage you to reflect on your experience in this session and think about any improvements that could be made to your own practice, the practice of your team or department or to any systems that you work within. Reviewing this handout may help you to do this.

Cardiac Chest Pain – The Initial Assessment and Management

Session Objectives

- Approach to initial assessment of chest pain
- Basic cardiac chest pain history
- Simple classification and stratification of chest pain
- Investigations in a patient with chest pain
- Initial management of chest pain
- When and how to escalate treatment and specialist intervention

Assessment

The complete assessment of any condition involves three components:

- History
- Examination
- Investigation

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History

The history is extremely important. There are many causes of chest pain – the classical description of **cardiac** chest pain is given here. Note that you should avoid asking leading questions like "is it heavy?"

- Ischaemic Pain
  - Substernal
  - Heavy, tight, dull, aching
  - Radiation to arm (left), shoulder, neck or jaw
  - Nausea, sweating, pallor, breathlessness
  - Worse with exertion
  - Duration of pain

Some features point away from the likelihood of a cardiac cause. One should always be wary as atypical presentations are common and it is best to err on the side of caution.

Past History and Risk Factors

- The most significant risk factor for the patient in front of you is the presence of pre-existing heart disease! - Have they had a heart attack or angina before?
- Always ask about medication and allergies. This may give you clues as to past or intercurrent problems that may impact on your treatment options.
- The presence of cardiovascular risk features like smoking of family history is also important. Several scoring systems exist. The TIMI score gives a percentage estimate of risk that the patient has unstable angina or will develop a NSTEMI.

The history of the presenting illness trumps everything! The ashen, sweaty 44-year-old with crushing chest pain has angina until proven otherwise, even if they have no risk factors!

Examination

The examination focuses on:

- Vital signs
- Searching for signs of complications of ischaemic heart disease
  - Cardiogenic shock
  - Pulmonary oedema
- Looking for signs suggesting another diagnosis
  - Fever and bronchial breathing – pneumonia
  - Absent breath sounds and hyper-resonance – pneumothorax

Investigations

- ECG
  - The first and most important test
  - Should be obtained and interpreted within 10 minutes of the patient's arrival

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- Blood tests

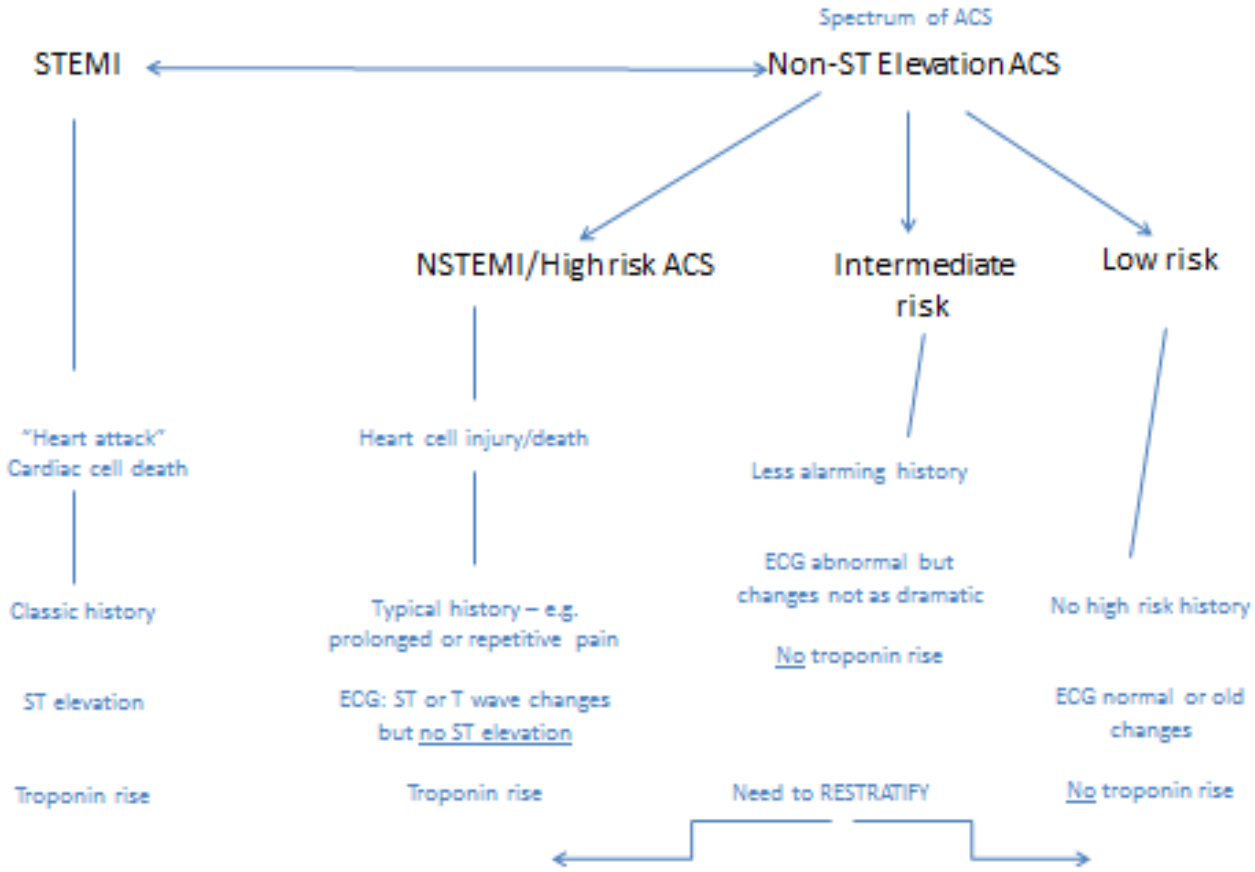
Injured heart muscle cells release a range of "biomarkers". These can be detected in the blood and provide evidence, or confirmation, that myocardial damage has occurred. Some of these biomarkers can take a while to rise to detectable levels. Usually an initial test is followed by a serial test several hours later. These biomarkers include:

- Troponins
- Creatinine Kinase
- Lactate Dehydrogenase

Keep up-to-date with your biochemistry laboratory as to which tests to order and at what times, some of these have changed many times over the last few years!

Continuum of Disease

A key part of the assessment of cardiac chest pain is determining the level of risk. The patient with ischaemic heart disease (IHD) can be anywhere on a spectrum from having a dangerous, fully blown ST elevation myocardial infarction (STEMI) down to having mild and stable angina. STEMIs need to be identified urgently (hence the ECG within 10 minutes).



A STEMI involves infarction of the ventricular wall often caused by complete occlusion of a coronary artery. Usually there will be a "classic" history and typical ECG findings of ST segment elevation.

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If there is no ST elevation the patient is likely somewhere on the "non-ST Elevation ACS" spectrum. At the high risk end of this continuum is NSTEMI with heart cell injury or death confirmed by a rise in biomarkers but without ST elevation.

At the low risk end there is typically a history of angina – but it isn't too dramatic. This patient will need further work, but there's no huge rush.

In between high & low risk is the intermediate group. The history & ECG aren't clearly telling you that they are high risk or low risk – and these patients need further testing (e.g. a "provocative study") to clarify their level of risk.

Treatment

Treatment for all ACS

- **Oxygen**. There is some evidence that very high O2 levels can be, counter intuitively, harmful. If O2 saturations are normal there is probably no need to give oxygen – but it should certainly be given if the O2 saturations are low
- **Antiplatelet therapy** - aspirin is amazingly effective in all of the ACS – from STEMI thru to low risk ACS. If the patient is truly allergic to it then clopidogrel can be used as an alternative
- **IV access** & take blood for lab tests
- **Pain relief**

STEMI

- Aspirin +/- clopidogrel
- Heparin (Low Molecular Weight Heparin or unfractionated)
- Urgent opening of the blocked artery
    - Percutaneous Intervention (PCI)
    - Thrombolysis +/- PCI

NSTEMI

- Aspirin +/- clopidogrel
- Admit
- Monitor
- Consider further anticoagulation
- Consider Beta-blocker – controversial. Discuss with a senior cardiologist

Intermediate Risk

- Re-stratify

Low Risk

- Discharge to early follow-up

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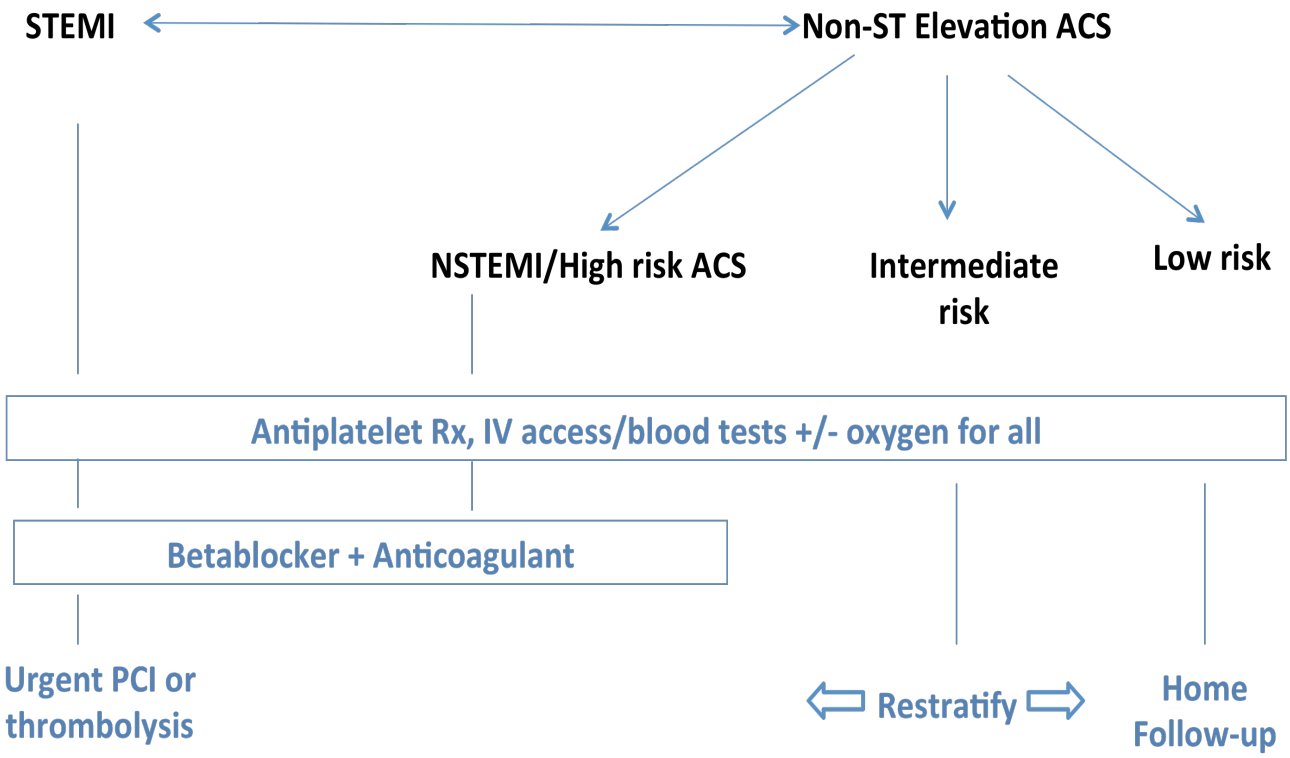

Pain Relief

Reducing the patient's pain is important – partially because it is one of our core jobs (!) and partially because relieving pain reduces some of the adrenergic stimulation and reduces the "work" of the heart.

- Nitrates are frequently used
  - Anginine under the tongue through to IV infusions
  - Venodilatation and some arteriodilatation
  - Caution as will usually drop the patient's blood pressure
- Morphine
  - Small titrated doses
  - Do not worry about "masking" symptoms

References and Further Reading

- Thrombolysis in Myocardial Infarction Study Group (homepage on the internet). TIMI Study Group; (cited 2012 June 06). Available from: http://www.timi.org/
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