THE ESCAPE CHEST PAIN UNIT PROTOCOL

Chest Pain Unit (CPU) assessment is defined as follows:

1) The CPU should be able to directly identify and assess patients as they arrive in the emergency department. Ideally it should be based in the emergency department.

2) The CPU should provide up to six hours of observation, serial ECG recording and biochemical cardiac testing, ideally consisting of an early marker (CK-MB(mass)) and a later marker (troponin). These should either be point-of-care or provided by laboratories with a turnaround time of one hour.

3) The CPU should provide exercise stress testing within 24 hours of attendance at the emergency department (preferably immediately but next working day is acceptable).

4) Patient selection and management will be determined by protocol, but with staff having the discretion to over-rule.

5) Patient management should be led by specialist nursing staff (Chest Pain Nurses), available at least from 9-5 each day.

This allows the following flexibility:

1) The CPU may be physically located away from the emergency department, provided CPU staff are readily available in the ED to assess patients and support ED staff.

2) The CPU does not need to be in a defined location. CPU patients can be managed alongside other ED, medical or observation patients, provided appropriate observation and investigations are available.

3) Continuous ECG monitoring (3 or 12 lead) is not routinely required. Arrhythmias are very uncommon and positive results from continuous ECG recording are overwhelmingly false positive.

4) Patients can be discharged home between observation/marker testing and stress testing, provided their markers are negative and they are asymptomatic.

The following protocol is used by the Northern General Hospital. This protocol has been extensively evaluated and is the recommended model of CPU care.

Staffing

- 3 Chest Pain Nurses
- Medical input provided by SHO & Middle Grade emergency medical staff co-ordinated by a Clinical Fellow in Emergency Medicine

Structure

A two-bedded unit located within the holding-bay area of the emergency department, with the potential to expand into the holding-bay.

Opening hours

9:00am to 9:00pm Monday to Friday, 10:00am to 6:00pm at weekends. Patients attending outside these hours are admitted to the medical ward and complete CPU assessment the following morning.
Exclusion criteria
1. Any of the following ECG changes, unless known to be old: >1mm ST elevation or depression, or >3mm T wave inversion in two contiguous leads; new atrial fibrillation; tachyarrhythmia (>120 beats per minute); bradyarrhythmia (<40 beats per minute); 2nd or 3rd degree heart block; or left bundle branch block
2. Known CHD with anginal pain that consists of recurrent episodes or an episode lasting more than one hour
3. Minimal risk of ACS, i.e. pain that is stabbing, pleuritic, positional or reproduced by palpation in a patient with no history of, and few risk factors for, CHD
4. Co-morbidity requiring hospital admission, e.g. heart failure, poor social support.
5. Suspected or proven alternative cause requiring hospital admission, e.g. pulmonary embolus, dissecting aortic aneurysm

Serial ECG recording
An ECG is recorded every hour. The patient is admitted if any of the following are recorded: >1mm ST elevation or depression in any two contiguous leads; T wave changes unrelated to posture or hyperventilation; arrhythmia; 2nd or 3rd degree heart block; or left bundle branch block.

Cardiac enzyme measurement
This depends upon the time from the most significant episode of pain to presentation at hospital:
- If more than 12 hours, one blood sample is taken for troponin T/I and CK-MB(mass) measurement
- If less than 12 hours, two blood samples are taken. The first is taken immediately for CK-MB(mass). The second is taken at least 2 hours later and at least 6 hours after the onset of pain for CK-MB(mass) and troponin T/I.

The patient is admitted if troponin T/I level is detectable; if either CK-MB(mass) level exceeds 5ng/ml; or if the CK-MB(mass) gradient exceeds 0.7ng/ml.

Exercise treadmill testing (ETT)
This uses the Bruce protocol and is interpreted as follows:
- Early positive: arrhythmia; >1mm ST elevation; or >1mm horizontal or downsloping ST depression at stage 1 or 2 of the Bruce protocol.
- Late positive: any of the above changes occurring at stage 3 or beyond.
- Negative: at least stage 3 and 85% of the predicted maximal heart rate achieved without the above ECG changes.
- Inconclusive: no ECG changes, but the patient is unable to achieve stage 3 or 85% of the predicted maximal heart rate.

Patients with early positive tests are admitted and those with negative tests are discharged. Patients with late positive, equivocal or inconclusive tests; who are unable to perform ETT or are known to have CHD are discharged with appropriate follow-up unless they have ongoing anginal pain.

Reference
http://emj.bmjournals.com/cgi/content/full/19/2/117