

Low Risk Chest Pain Evaluation and Disposition Guideline
University of Maryland Medical System
Emergency Medicine Risk Forum

Background

Chest pain is the most common reason for admitting patients to the emergency department. Admission to the hospital is expected for patients with a concerning history, EKG, risk factors, and/or cardiac enzymes. However, one must consider the risks, costs, and allocation of resources in admitting patients with chest pain that are considered low risk and may be further risk stratified as an outpatient. This document will outline a guideline to the evaluation and disposition of the low risk chest pain patient. This is intended for those patients that the clinician feels further cardiac evaluation is warranted, not for those patients that have a non-cardiac etiology based on the evaluation completed in the emergency department.

Literature Review

After an exhaustive review of the most recent medical literature, the University of Maryland Medical System Emergency Medicine Risk Forum recommends the use of the HEART score for the evaluation of patients with chest pain. The study was created in the Netherlands, validated by Wake Forest University, and subsequently prospectively validated in the Netherlands again (Backus, et. al., A prospective validation of the HEART score for chest pain patients at the emergency department. International Journal of Cardiology 168 (2013) 2153-2158).

The HEART score is composed of 5 components: history, ECG, age, risk factors, and a single current generation troponin at arrival. For each component, 0, 1, or 2 points is given.

History	Highly suspicious	2
	Moderate suspicious	1
	Slightly or non-suspicious	0
ECG	Significant ST-depression	2
	Nonspecific repolarization disturbance	1
	Normal	0
Age	≥ 65 years	2
	> 45 - <65 years	1
	≤ 45 years	0
Risk factors	≥ 3 risk factors, or history of atherosclerotic disease	2
	1 or 2 risk factors	1
	No risk factors known	0
Troponin	> 3x normal limit	2
	> 1 - <3x normal limit	1
	≤ Normal limit	0

Risk factors were defined as diabetes, current or recent (<1 month) smoker, hypertension, hyperlipidemia, family history of coronary artery disease, and obesity (BMI>30). Significant ST depression was defined as changes of 1mm or greater. T wave inversions and ST depression of 0.5mm was considered non-specific.

2388 patients with chest pain were enrolled and evaluated for a major adverse cardiac event (MACE) within 6 weeks (AMI, positive catheterization or PCI, CABG, or death). Overall population demonstrated that 17% had a MACE within 6 weeks, 6.4% had an AMI, and 0.7% died.

When the HEART score was applied:
Score 0-3: 1.7% had a MACE

0.4% (1 patient) died
36.4% of patients were in this low risk group.
Score 4-6: 16.6% had a MACE
Score 7-10: 50.1% had a MACE

Furthermore, Wake Forest has adopted the Heart score across their system. In their studies, they utilized 2 troponins (at arrival and 3 hours later) rather than the originally proposed single troponin and have found that they decreased their miss rate from 1.7% to less than 1% at 30 days with no deaths.

In addition to the use of the HEART score, a Shared Medical Decision-Making Model was investigated for incorporation into the guideline. Such a tool has been demonstrated to increase patient knowledge, communication, and patient's feeling of engagement in decision-making and satisfaction. (Hess, et al. The Chest Pain Chose Decision Aid: A Randomized Trial. *Circ Cardiovasc Qual Outcomes*. 2012;5: 251-259). Furthermore, the 2010 Patient Protection and Affordable Act endorses and encourages shared decision-making processes.

Guideline

Application of the HEART score can guide the emergency medicine provider to risk stratify those patients presenting with chest pain as low risk (Score 0-3) or moderate to high risk. Those patients that score between 4 and 10 should follow currently established guidelines at their local institutions for the acute evaluation of potential cardiac disease.

Based on the HEART study, additional literature review, and UMMS EM Risk Forum consensus, patients with a HEART score of 0-3 should:

1. Have the attached Shared Medical Decision Making discussed with and reviewed by patient.
2. Repeat troponin and ECG at hour 3. Current evidence suggests a repeat troponin at hour 3 from initial EKG reduces potential miss rate from 1.7% to <1% at 30 days.
3. If troponin and ECG are unchanged, follow shared medical decision as discussed with patient.
4. If troponin is increasing and/or positive with 2nd set of enzymes, the patient should be admitted for further evaluation.
5. If patient decides to follow up as an outpatient, follow up should be established within 1 week for further cardiac evaluation and the patient should receive a copy of the Shared Medical Decision Making document.
6. Document medical decision-making and HEART Score in the medical record.