Chest Pain in the Emergency Department TIMI vs HEART Score

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Abstract

Chest pain presentation has grown into a public health concern as patients crowd emergency departments for urgent evaluation. This has led not only to hospital congestion and increased length of emergency room stays, but also the utilization of costly resources such as subsequent hospital admissions and objective cardiac testing. Risk stratification is an important component of chest pain assessment, as it can determine subgroups that necessitate inpatient intervention while identifying those safe for early discharge. The TIMI tool has persisted as the standard for risk evaluation, but the HEART score has recently emerged as a potential superior method. A retrospective chart review of patients who presented to the emergency department with chest pain retrieved components of existing documentation to risk stratify patients according to each scoring method and compare their accuracy in predicting major adverse cardiac events (MACE). After accounting for inclusion and exclusion criteria, a total of 381 patient charts were reviewed for risk score calculation and evaluated for reaching an endpoint, or MACE. The HEART scoring method demonstrated stronger diagnostic accuracy than the TIMI, as well as increased sensitivity, specificity, positive predictive value, and negative predictive value. The routine use of a precise risk stratification tool incorporated into a policy or clinical practice guideline has the potential increase clinician confidence in facilitating discharge of low risk patients, while directing those with increased risk for more thorough workups. This, in turn, allows for hospital decongestion and fiscal savings without compromising patient safety and quality care.

Biography

Maria Christina Bernardo has worked in the emergency department setting for seven years , with focus on the last three years as an observation nurse practitioner evaluating the chest pain population. Working closely with emergency department practitioners and cardiologists, she has worked diligently on assessing the effects of chest pain work ups to improve patient safety and efficiency of care at her current institution.

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Images

TIMI UA/NSTEMI RISK SCORE	
1) Age ≥65	1 point
2) ≥3 risk factors for CAD	1 point
3) Use of ASA (last 7 days)	1 point
4) Known CAD (prior stenosis ≥50%)	1 point
5) >1 episode rest angina in <24 h	1 point
6) ST-segment deviation	1 point
7) Elevated cardiac markers	1 point

HEART

HEART score for chest pain patients			
History	Highly suspicious	2	
	Moderately suspicious	1	
	Slightly suspicious	0	
ECG	Significant ST-deviation	2	
	Non specific repolarisation disturbance / LBTB / PM	1	
	Normal	0	
Age	≥ 65 years	2	
	> 45 and < 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 and < 3x normal limit	1	
	≤ 1x normal limit	0	
		Total	

*Risk factors for atherosclerotic disease:

Hypercholesterolemia	Cigarette smoking
Hypertension	Positive family history
Diabetes Mellitus	Obesity

Recent Publications

1. Mahler, S. A., Riley, R. F., Hiestand, B. C., Russell, G. B., Hoekstra, J. W., Lefebvre, C. W., . . . Elliott, S. B. (2015). The HEART Pathway Randomized Trial Identifying Emergency Department Patients With Acute Chest Pain for Early Discharge. *Circulation: Cardiovascular Quality and Outcomes, 8*(2), 195-203
2. Nieuwets, A., Poldervaart, J., Reitsma, J., Buitendijk, S., Six, A., Backus, B., . . . Doevendans, P. (2016). Medical consumption compared for TIMI and HEART score in chest pain patients at the emergency department: a retrospective cost analysis. *BMJ Open, 6*(6), e010694.
3. Six, A. J., Cullen, L., Backus, B. E., Greenslade, J., Parsonage, W., Aldous, S., . . . Than, M. (2013). The HEART score for the assessment of patients with chest pain in the emergency department: a multinational validation study. *Critical pathways in cardiology, 12*(3), 121-126.
4. Sun, B. C., Laurie, A., Fu, R., Ferencik, M., Shapiro, M., Lindsell, C. J., . . . Kirk, J. D. (2016). Comparison of the HEART and TIMI risk scores for suspected acute coronary syndrome in the emergency department. *Critical pathways in cardiology, 15*(1), 1-5.
5. Visser, A., Wolthuis, A., Breedveld, R., & Avest, E. (2014). HEART score and clinical gestalt have similar diagnostic accuracy for diagnosing ACS in an unselected population of patients with chest pain presenting in the ED. *Emergency Medicine Journal*, emermed-2014-203798.