



**Service Priorities and Programmes**  
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**Comparison of Clinical Prediction Scores in Predicting 30-days Major Adverse Cardiac Events in Patients with Undifferentiated Chest Pain in Emergency Department**

**Department**

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**Introduction**

Patients with chest pain account for a significant proportion of attendance of the Emergency Department (ED). Recent guidelines of the American Heart Association and the European Society of Cardiology recommended quantitative assessment of ischemic risk by means of scores over clinical gestalt.

**Objectives**

This study aimed to compare the diagnostic accuracies of commonly used scores, namely the TIMI, GRACE, HEART scores and the North America Chest Pain Rule, in a cohort of patients attending ED for chest pain.

**Methodology**

We performed a prospective cohort study in patients  $\geq 18$  years old who attended the ED with undifferentiated chest pain. Relevant information was gathered including the clinical history, physical examination, electrocardiographic findings and cardiac biomarkers. Clinical prediction rules were applied accordingly with scores calculated. The clinical prediction rules were modified from the original ones excluding components requiring judgment by clinical gestalt. The primary outcome was 30-days major adverse cardiac event (MACE). Performance of the tests were evaluated by receive operating characteristic (ROC) curves and the area under curves (AUC).

**Result**

1081 patients were included in the study. 30-days MACE occurred in 164 (15.1%) patients. The AUC of GRACE score was 0.756 (95% CI 0.717-0.795) which was inferior to TIMI score [AUC 0.809 (95% CI 0.777-0.841)] and HEART score [AUC 0.845 (95% CI 0.812-0.878)]. A TIMI score  $\geq 1$  had a sensitivity of 97% (95% CI 92.7%-98.9%) and a specificity of 45.7% (95% CI 42.4%-49%). A GRACE score  $\geq 50$

had a sensitivity of 99.4% (95% CI 96.1%-100%) and a specificity of 7.5% (95% CI 5.9%-9.5%). A HEART score  $\geq 1$  had a sensitivity of 98.8% (95% CI 95.2%-99.8%) and a specificity of 11.7% (95% CI 9.7%-14%). The North America Chest Pain Rule had a sensitivity of 93.3% (95% CI 66%-99.7%) and specificity of 51.5% (95% CI 44.9%-58%).

In conclusion, the modified HEART score had the best discriminative capacity in predicting 30-days MACE. The GRACE score had an inferior performance likely related to not involving risk factors in the score calculation. Achieving a low-risk criteria based on objective parameters without clinical gestalt is feasible to identify low-risk patients for early discharge from the emergency department.