Methods: The study compared patients who died in-hospital to those who survived to discharge in a cohort of 93 patients meeting strict definitions for CS to identify correlates associated with mortality.

Results: The overall in-hospital mortality rate for the study cohort was 33%. The baseline characteristics were balanced except for older average age and left ventricular ejection fraction in those who died (p=0.049 and p=0.014, respectively). As detailed in the Table, the insertion of IABP pre-PCI, cardiac arrest at the catheterization lab, and lower ejection fraction (EF) were all correlated with in-hospital mortality (odds ratios 2.68, 5.93 and 0.02, respectively).

Conclusions: In the era of PPCLI and IABP as standard of care in AMI complicated by CS, patients with low EF, those who necessitate IABP insertion pre-PCI and those who necessitate CPR during PCI are at higher risk for in-hospital mortality and should be considered for more robust devices (e.g. assisted devices) with an attempt to improve their prognosis.

### Table 1. The demographic and clinical characteristics of patients with AMI complicated by CS.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Odds Ratio (95% CI)</th>
<th>Lower OR-Upper OR</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>1.04</td>
<td>1-1.07</td>
<td>0.053</td>
</tr>
<tr>
<td>Men</td>
<td>0.87</td>
<td>0.35-2.15</td>
<td>0.756</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>1.23</td>
<td>0.5-3.01</td>
<td>0.646</td>
</tr>
<tr>
<td>Body mass index</td>
<td>0.91</td>
<td>0.83-1</td>
<td>0.059</td>
</tr>
<tr>
<td>Ejection fraction (%)</td>
<td>0.02</td>
<td>0-0.5</td>
<td>0.018</td>
</tr>
<tr>
<td>Number of diseased vessels</td>
<td>1.54</td>
<td>0.93-2.6</td>
<td>0.102</td>
</tr>
<tr>
<td>IABP pre PCI</td>
<td>2.68</td>
<td>1.11-6.52</td>
<td>0.029</td>
</tr>
<tr>
<td>Pre-hospital CS</td>
<td>0.183</td>
<td>0.76-4.33</td>
<td>1.81</td>
</tr>
<tr>
<td>CPR in the catheterization</td>
<td>5.93</td>
<td>1.66-21.2</td>
<td>0.006</td>
</tr>
</tbody>
</table>

### CRT-29

**Comparison Of Outcomes Of Patients Presenting With Inferior STEMI With Proximal And Distal Right Coronary Artery Occlusion**

Mauna Kaulbik, Alok Saurav, Satish Chandraprakasham, Anand Deshmukh, Michael Del Core, Aryan Moos, Dennis Esterbrooks
Creston University School of Medicine, Omaha, NE

**Background:** While, proximal right coronary artery (RCA) occlusion in patients with inferior STEMI would suggest right ventricular involvement, the effect of location of RCA occlusion on outcomes has not been studied. We sought to evaluate the impact of site of occlusion of RCA on outcomes of patients with inferior STEMI undergoing PCI.

**Methods:** All patients presenting to a tertiary care center between June 2006 and May 2012 with STEMI and undergoing PCI with RCA as the culprit vessel were included. Patients with proximal RCA occlusion were compared to patients with distal RCA occlusion. Lesion location was determined based on whether the occlusion was proximal or distal to major right ventricular branch take-off. Patients with posterior descending branch or posteriorateral branch occlusion were excluded to correct for left ventricular myocardial risk at risk in both comparison groups. Clinical and outcome variables were retrieved from retrospective chart review.

**Results:** One hundred, ninety-seven patients were included in final analysis of which, 94 patients had proximal RCA and 103 had distal RCA occlusion. There were no significant differences between the two groups with respect to gender, prevalence of hypertension, hyperlipidemia (HL), diabetes mellitus (DM), smoking, chronic pulmonary disease and timely revascularization. Twenty-four patients were treated with PTCA, while 173 patients were treated with stenting. Major adverse cardiovascular events (MACE) defined as combined incidence of cardiogenic shock, IABP use, cardiac arrest and death was similar in the two groups (21.3% vs. 18.4%; p < 0.05). Individual event rates for cardiogenic shock, IABP use, death, cardiogenic shock and hypotension were also statistically similar in both groups. Post STEMI left ventricular function was similar in both groups (46.8% vs 47.2%; p = 0.77) as was the duration of hospitalization (5.06 vs. 5.17 days; p = 0.75). No clinical variables (gender, hypertension, DM, smoking, HL, chronic pulmonary disease, etc.) predicted MACE. However, time to revascularization > 6 hours from symptom onset showed a statistical trend towards predicting MACE (OR=0.50 [95% CI 0.24-1.05], p = 0.06).

**Conclusions:** In patients presenting with inferior STEMI treated with PCI, location of occlusion with respect to the right ventricular branch origin does not predict major adverse cardiovascular events. Proximal lesion location in right coronary artery should not be used as a surrogate for clinically significant right ventricular involvement in STEMI patients.

### CRT-30

**Prediction Of Multivessel Disease In STEMI Patients**

Eric Bansal, Nazlia Rad, Andres Cortes, Brittany Wagman, Kenneth Kita, Han Yun, Ray Matthews, Ankikumar Mohra, Michael Gaglia, Leonardo Clavijo, David Shavelli University of Southern California, Los Angeles, CA

**Background:** Although early loading of antplatelet therapy is beneficial for STEMI patients, it may cause bleeding complications in patients with multivessel coronary artery disease (MVD) requiring coronary artery bypass surgery. The identification of MVD in STEMI patients using the initial electrocardiogram (ECG) would be beneficial. We therefore investigated the ability of the initial ECG to predict MVD in STEMI patients.

**Methods:** From January, 2008 through December, 2010, 224 patients undergoing primary PCI for STEMI were evaluated. Baseline demographics, ECG findings, angiographic findings and in-hospital clinical events were collected. ECG findings included the amount of ST segment elevation and/or depression in mm in all ECG leads and the total number of leads with > 1 mm ST segment elevation and/or ST segment depression. MVD was defined as ≥ 2 coronary vessels with > 70% luminal diameter stenosis, single vessel disease (SVD) was defined as 1 coronary vessel with > 70% luminal diameter stenosis. Patients with SVD (n=106) were compared to those with MVD (n=118) and predictors of MVD disease were evaluated using multiple logistic regression analysis.

**Results:** Patients with MVD had a higher prevalence of hypertension, hyperlipidemia, diabetes mellitus, metabolic syndrome and a family history of CAD compared to those with SVD. The left anterior descending artery was more commonly the infarct related artery in patients with SVD compared to the right coronary artery in patients with MVD. In-hospital MACE rates were significantly higher in patients with MVD compared to those with SVD, 30.5% versus 17.9%, p = 0.03; hyperlipidemia, hypertension, diabetes mellitus, total ST segment changes > 6 mm and total number of ECG leads with > 1 mm ST segment depression predicted the presence of MVD. After adjusting for age and gender, more than 3 ECG leads with > 1 mm of ST segment depression predicted the presence of MVD, odds ratio 3.79 (95% CI 1.2 to 12.3, p = 0.03).

**Conclusions:** STEMI patients with MVD can be identified based upon the initial ECG.

### CRT-31

**Total Bilirubin Predicts Long Term Clinical Outcomes In No-reflow Patients With Acute St-segment Elevation Myocardial Infarction During Primary Coronary Intervention**

liu jiangfeng, Sr., Chen Yundai, wang changhua, tian feng, yang junjie, zhang tao Chinese PLA General Hospital, Beijing, China

**Background:** Increased oxidative stress and vascular inflammation are main mechanisms for no reflow onset after acute ST-segment elevation myocardial infarction (STEMI) who were treated by primary percutaneous coronary intervention (PCI). Recent studies have shown that the concentration of total bilirubin (TB), acted as antioxidant, could preserve coronary flow reserve and coronary microvascular functions and was reversely associated with in hospital outcomes of primary PCI. However, it is not clear whether high TB exert favorable effects on prognosis of no reflow patients during PCI. This study was performed to assess the prognostic role of TB in no reflow patients.

**Material and Methods:** 143 consecutive patients (age: 65.29±12.62 years old) with no reflow treated by primary PCI was enrolled to study. Patients were divided into two groups based on the TB concentrations (0.9 mg/dl). No-reflow was diagnosed using 2 different methods after PCI: TIMI flow Grade ≤2 or TIMI flow grade 3 with a TIMI myocardial perfusion grade (TMPG) ≤1. All patients were retrospectively followed up for 9 years for the all cause death and cardiac death.

**Results:** There were 31 all cause deaths during follow-up. Of them, 26 patients died from cardiac cause. Patients with adverse events had lower baseline serum TB levels (P<0.05). All patients were stratified into high TB and low TB groups. The mortality of
high TB group is lower than that of low TB group (14.9% vs. 29.0% for all cause death, P=0.038; 9.5% vs. 27.5% for cardiac death, p=0.006). In a multivariate Cox regression analysis, after adjusted for age, left ventricular ejection fraction (LVEF) et al., the patients had the lower incidence of all cause death and cardiac death in the high TB group than that in the low TB group (OR=0.423, 95%CI 0.184-0.975, p=0.043, vs. OR: 0.281, 95%CI 0.103-0.765, P=0.013, respectively).

**Conclusions:** Serum high TB level on admission is a protective and independent predictor of long term outcomes among no-reflow patients with STEMI undergoing primary PCI. In addition, TB concentrations may be a novel candidate biomarker for stratification of risk in no reflow patients with STEMI during primary PCI.

### Antiplatelet Therapy

#### CRT-32

**Universal Ticagrelor Versus Assay-Driven Antiplatelet Therapy in Acute Coronary Syndrome Patients: A Cost-Effectiveness Analysis**

Brendan L. Limone,1 Craig I Coleman*  
1Hartford Hospital, Hartford, CT; 2University of Connecticut, Storrs, CT

**Background:** Assays have been developed to monitor on-P2Y12 platelet reactivity, and these tests can accurately predict which patients will have poor response to clopidogrel. We sought to determine the cost-effectiveness of using a platelet reactivity assay to aid in the selection between ticagrelor and clopidogrel based dual antiplatelet therapy in ACS patients.

**Methods:** A hybrid decision tree/Markov model was used to calculate 5 year costs (2011 US$), quality adjusted life years (QALYs) and incremental cost-effectiveness ratios (ICERs) of 1 year of platelet reactivity assay-driven ticagrelor (given to patients with high platelet reactivity defined as >230 on the VerifyNow P2Y12 assay, Accumetrics, San Diego, CA; others got generic clopidogrel) or universal (given to all patients) ticagrelor. We assumed a cohort of 65 year old ACS patients and 32% and 13% incidences of high platelet reactivity at discharge and at 1 month. The analysis was conducted from a US payer perspective and used a 1 year cycle length. Data depicting the efficacy and safety of ticagrelor and clopidogrel were taken from multinational randomized trials.

**Results:** Patients experiencing an acute coronary event treated with ticagrelor or clopidogrel based on the results of the platelet reactivity assay lived an average of 3.497 QALYs at a treatment cost of $30,615. Those receiving universal ticagrelor lived an average of 3.530 QALYs and incurred costs of $32,865 (ICER for universal ticagrelor= $68,182/QALY). Universal ticagrelor was not cost-effective unless the yearly cost of ticagrelor was <$2,800, the yearly cost of clopidogrel rose above $1,100 or the hazard ratio for death on ticagrelor vs. clopidogrel was <0.74. Monte Carlo simulation suggested universal and platelet reactivity assay-driven selection of ticagrelor would have a 25-75 percentile of 30-day death, myocardial infarction, or urgent target vessel recanalization occurred in 6.9% and 8.8% of patients randomized to HDB ticagrelor and abciximab, respectively.

**Conclusions:** Serum high TB level on admission is a protective and independent predictor of long term outcomes among no-reflow patients with STEMI undergoing primary PCI. In this analysis, we retrospectively analyzed CK-MB levels in the 4 arms of the study.

**Methods:** Serial CK-MB samples were obtained in 380 of the 383 enrolled patients.

**Results:** A non-inferiority analysis with margin of 2 ng/mL was performed using PROC TTEST of SAS version 9.2, with HDB ticagrelor and abciximab study arms pooled across levels of UFH and bivalirudin. The non-inferiority of HDB ticagrelor vs. abciximab was established from a one-sided test for the difference in peak CK-MB means (p-value = 0.011), with a corresponding 90% confidence interval of (−0.52, 6.86) for abciximab minus HDB ticagrelor.

**Outcomes Of Anti-platelet Therapy For Acute Coronary Syndromes Patients Directed By Post Pci Platelet Function Testing In A Real World Setting**

Elad Abir, Perry Amarado, Mytyle Mayuga, Martin Bradley, Ka Chin Alan Chan, Isidore Okere, Darwin Jeyaraj, Daniel J Simon, Tom Larson  
Harrington Heart & Vascular Institute, Case Medical Center, University Hospitals, Cleveland, OH

**Objectives:** To assess whether Accumetrics VerifyNow P2Y12 testing directed anti-platelet therapy after acute coronary syndromes (ACS) percutaneous coronary intervention (PCI) in a real world setting, could affect outcomes.

**Background:** Multiple trials suggest that high residual on-treatment platelet reactivity (HRPR) [Platelet Reactivity Units (PRU) ≥230] increases the incidence of major adverse cardiac events; death, myocardial infarction, target vessel recanalization and stent thrombosis (MACE). Data on routine real world testing of ACS patients is lacking.

**Methods:** 371 ACS patients had PCI and platelet function testing after initial background aspirin and ≥ 600 mg of clopidogrel. For PRU at 12-24 hours < 230, maintenance 325 mg/day of aspirin and 75 or 150 mg/day of clopidogrel for 1 week then 75 mg/day were continued unless followup testing at 1-3 weeks demonstrated HRPR. Most patients with initial HRPR were switched to prasugrel or ticagrelor with no further testing, as hyporespose is rare; or clopidogrel 150 mg/day with repeat testing at 1-3 weeks. Continued HRPR on clopidogrel usually drove switching to prasugrel or ticagrelor that was continued.

**Results:** There were 148 (40%) HRPR and 223 (60%) responders patients. MACE was similar between the two groups [5/148 (3.4%) vs. 6/223 (2.7%), respectively, p=0.76]. Even after subdividing ACS to unstable angina (UA) and Non ST elevation MI