(3.2%) had contraindications to transition. Of 118 eligible for transition, 97.5% did so within 6 hrs.

Conclusion: Rapid, predictable, and safe BP control was achieved with CLV using a simple, non-weight based titration regimen. We determined that 2 mg/h was a safe starting dose that decreased BP without causing clinical hypotension. Finally, transition to oral treatment within 6 h of stopping CLV was successful in >90% of patients.

25 Reduction in Door-to-Balloon Time: Implementation of an Improvement Program at a Hospital Already Achieving An Average 90-Minute Target Time

Paige PG, Whittaker P, Furman MI, Bosker G, Volturo GA/University of Massachusetts Medical School, Worcester, MA; South Shore Hospital, Weymouth, MA

Study Objectives: A target time of 90 minutes from hospital arrival has been established for catheter-based revascularization of patients with ST-segment elevation myocardial infarction (STEMI). Although analysis of practices used by hospitals that achieve this target has provided recommendations for improvement in door-to-balloon time (DBT), we are unaware of any study to examine the effect of implementation of such strategies at a hospital already meeting the target. We employed a collaborative Emergency Department - Interventional Cardiology team (EDICT) to implement a DBT-improvement protocol in an attempt to decrease DBT further and to increase the number of patients meeting the 90-minute target.

Methods: We implemented a series of interventions targeted to improve both on-hours (7:00am - 7:00pm, Monday-Friday) and off-hours (including weekends) DBT. Our 11-step program included Emergency Department (ED) activation of the Cath Lab, a defined route between the ED and Cath Lab, ED parking spaces for the Cath Lab staff, and direct deployment of the cardiologist to the ED. We recorded DBT for 161 STEMI patients; 102 prior to EDICT (Nov 2004 - June 2006) and 59 after (July 2006 - April 2007). We also determined the time taken for each of three steps in the DBT process; (1) from hospital arrival to EKG, (2) from EKG to Cath Lab arrival, and (3) from Cath Lab arrival to balloon inflation. These results were further divided into on- and off-hours hospital arrival.

Results: DBT for all patients decreased from 90±4 to 65±4 minutes ($p<0.0001$) post-EDICT, while the proportion of patients achieving the 90-minute target increased from 49 to 85% ($p<0.0001$). The times (in minutes) for each DBT component and the on- versus off-hours results are shown in the table. (* $p<0.05$; ‡ $p<0.005$; † $p<0.0001$) Substantial reductions (>30%) were achieved for both on- and off-hours DBT. Improvements occurred in all three steps; however, the largest reductions were in the time between EKG and Cath Lab arrival.

Conclusions: It is possible to reduce DBT even at a hospital that had a mean DBT of 90 minutes before implementation of the initiatives. Our initiatives had the greatest effect for patients arriving during the potentially vulnerable off-hours period.

Time (minutes)

	On-Hours		Off-Hours	
	Pre	Post	Pre	Post
EKG	8 ± 2	3 ± 2	7 ± 1	5 ± 2
Cath Lab	37 ± 4	25 ± 5	72 ± 3	48 ± 3 †
Balloon	23 ± 2	21 ± 2	30 ± 2	22 ± 1 ‡
Total Time	68 ± 5	49 ± 6 *	108 ± 4	75 ± 4 †

26 Abstract Withdrawn

27 Knowledge of Angiogram Results: Patient Recall of Coronary Angiogram Results is Inaccurate

Slattery DE, Evangelista E/University of Nevada School of Medicine, Las Vegas, NV; University Medical Center of Southern Nevada, Las Vegas, NV

Study Objectives: Emergency physicians are encountering more patients who present with suspected acute coronary syndrome who have had a previous cardiology evaluation. Patients with a previous angiogram represent a unique challenge to emergency physicians. If actual reports are not readily available, the patient's recall may play a pivotal role in the evaluation, management, and disposition of these patients. To the best of our knowledge, no study has tested the accuracy of patient's knowledge of this important test result. We sought to determine the accuracy of angiogram result recall by patients who present to an emergency department with symptoms suspicious of acute coronary syndrome.

Methods: The study was approved by our Institutional Review Board.

Design: Prospective, observational study with both prospective and retrospective data collection components.

Setting: Academic emergency department with interventional cardiology capability and preference.

Participants/Subjects: From March 2006 to May 2006, a convenience sample was performed. Patients were eligible for inclusion if they presented with cardiac related signs/symptoms, had a previous coronary angiogram within the past 5 years, and consented to participate in the study. Patients were excluded if they had a diagnosis of dementia, mental illness, or if they had a learning disability. Patients completed a questionnaire while in the emergency department. Consent for medical records access was obtained, and medical records request for information were logged and requested. Cardiac catheterization/intervention results were abstracted using a standardized data collection tool by trained abstractors who were blinded to the patient's responses. Data were entered into a database (MS ACCESS), and 100% of the data entry was adjudicated by the principle investigator prior to data base lock. Data were analyzed using NCSS statistical software. Our primary outcome measure was accuracy of the patients' recall. regarding their cardiac catheterization results. We also determined the degree of coronary artery disease and any intervention.

Results: During the study period, 637 (7% of our ED volume) were evaluated for suspected Acute coronary syndrome. 125 patients were enrolled. The mean (± SE) age was 59.72 (1.14) years and 62% were male. 102 (82%) remembered their angiogram results. 27 of these cases were not included in the final analysis because of the following reasons: No records were received (n=16), No angiogram was done (N= 6); and 5 patients could not remember if it was normal. This left 75 cases with complete data for the primary measure of this study. When patients recalled their angiogram results as being "Abnormal" (43/75) they had an abnormal angiogram in 38 cases (sensitivity (95% CI) = 76 (63,86)%; LR(+)= 3.8). When patients recalled their angiogram as being "Normal" (32/75) they were normal in 20 of the cases (specificity (95% CI)=80 (61,91)%; LR(-) = 1.2). Analysis of these showed 5 had single vessel disease, and 7 had multi-vessel disease. 4 had stents deployed, and 2 underwent bypass. Limitations: The study was limited by it being conducted at a single institution, and by the large number of cases that had to be excluded.

Conclusion: Patient recall of the previous angiogram results is inaccurate and should not be relied on when making management or disposition decisions in the emergency department.

28 The Efficacy of Tamsulosin in the Treatment of Ureteral Stones in Emergency Department Patients

Ferre RM, Wasielewski JN, Perron AD, Strout TD/Wilford Hall Medical Center, San Antonio, TX; Maine Medical Center, Portland, ME

Background: Several recent studies published in the urology literature have suggested that the α-adrenergic antagonist tamsulosin decreases time to stone passage and improves pain scores in adults with ureteral calculi seen in urology clinics. Little is known about the efficacy of tamsulosin in the treatment of emergency department (ED) patients with ureteral calculi.

Study Objective: The purpose of this study is to determine the efficacy of the α-adrenergic antagonist tamsulosin in the treatment of adult ED patients with ureteral colic secondary to lower ureteral calculi.

Methods: This prospective, randomized, trial was conducted at an academic tertiary care referral center and was approved by the IRB. Adult patients with a distal ureteral calculus were eligible for inclusion; participants were randomized to receive standard therapy (non-steroidal anti-inflammatory medication and oxycodone) or standard therapy plus tamsulosin 0.4 mg daily for 10 days. Subjects recorded outcomes on a follow-up diary and telephone follow-up was conducted at 48, 72, and 336 hours post-ED discharge. Outcome measures included: time to stone expulsion, stone expulsion rate, self-reported 11-point numeric rating scale pain scores, return ED visits, narcotic medication requirement, days of missed work or usual function, number of colicky pain episodes, and medication side effects.

Results: Forty-four patients were enrolled in the study with 42 completing the study protocol. Subjects were primarily male 75% (n=33), white 93.2% (n=41), and had a mean age of 46.2 years +/− 15.8, 95% CI: 41.4-51.0 years. More subjects in the treatment group spontaneously passed their stones (68.2% vs. 50.0%, p = 0.000). Those receiving tamsulosin had lower mean self-reported pain scores at 48 hours (5.6 standard therapy, 2.6 tamsulosin, p = 0.014), fewer episodes of colicky pain (8.2 standard therapy, 3.3 tamsulosin, p = 0.032), and fewer unscheduled visits

to a physician or the ED (30% standard therapy, 20.8% tamsulosin, p = 0.000). While trends towards fewer days of missed work or function and a smaller narcotic requirement were observed in the tamsulosin group, these findings did not reach statistical significance. Kaplan-Meier survival analysis did not reveal an association between tamsulosin and a shortened time to stone expulsion, log rank chi-square = 0.08, df = 1, p = 0.7777. No adverse medication effects were reported.

Conclusions: In this cohort of adult ED patients with distal ureteral stones, subjects receiving tamsulosin in addition to anti-inflammatory medications and narcotic analgesics experienced fewer episodes of colicky pain, had fewer unscheduled visits to physicians or the ED, and had lower self-reported pain scores than those receiving anti-inflammatories and narcotics alone. Trends towards fewer days of impaired functionality and a smaller narcotic requirement were noted and survival analysis failed to reveal a shortened time to spontaneous stone expulsion, possibly due to small enrollment numbers.

29 The Diagnostic Utility of Heart-type Fatty Acid Binding Protein in Patients With Possible Acute Coronary Syndromes Presenting to the Emergency Department

Lindsell CJ, Hollander JE, O'Neil BJ, Jackson RE, Ryan RJ, Schreiber D, Sperling MI, Raab D, Gibler WB/University of Cincinnati, Cincinnati, OH; University of Pennsylvania, Philadelphia, PA; William Beaumont Hospital, Royal Oak, MI; Stanford University, Palo Alto, CA

Study Objectives: Heart-type Fatty Acid Binding Protein (H-FABP) has shown potential for use in the triage of chest pain patients. This study evaluates the diagnostic test characteristics of H-FABP for detecting unstable angina/non-ST segment elevation myocardial infarction (UA/NSTEMI) in a well characterized sample of chest pain patients presenting to the emergency department.

Methods: Data were extracted from a multi-center study of patients being evaluated for possible acute coronary syndromes, a component of which involved plasma banking. Patients with a history of autoimmune disease or renal failure, or with a diagnosis of polymyositis, aortic dissection or gastroesophageal reflux were excluded. The criterion standard for UA/NSTEMI was defined as positive cardiac troponin or positive imaging or angiography without ST segment elevation on initial ECG. Cases eligible for inclusion as UA/NSTEMI negative were those with no evidence of acute coronary syndromes (normal, nonspecific or non-diagnostic ECG, no elevated cardiac troponin, and no positive invasive or non-invasive testing). Assignation as positive or negative occurred blinded to H-FABP. H-FABP was measured in duplicate, using a quantitative sandwich-enzyme-linked immunosorbent assay (ELISA; Dainippon Pharmaceutical Co. Ltd). Assays were conducted blinded to clinical data. The ROC curve, and the interval likelihood ratios and diagnostic test characteristics for breakpoints in the ROC curve are given. *A priori* power analysis required 200 samples with a 10% prevalence of UA/NSTEMI for the 95% confidence interval of an area under the ROC curve of 0.8 to be ±0.07.

Results: There were 19 UA/NSTEMI positive patients among the 1519 eligible patients. 181 UA/NSTEMI negative patients were group matched to reflect the age, race and sex profile of UA/NSTEMI positive patients. The mean age was 71 (SD 12) years, 29% were black and 48% were male. All but one patient in the positive group had a positive cardiac troponin, two had positive imaging, eight had coronary artery disease on angiography, and five underwent percutaneous coronary intervention. The area under the ROC curve was 0.820 (SE 0.055). The positive likelihood ratio for H-FABP>15.5ng/ml was 12.3 (95%CI 9.0 to 16.8), the negative likelihood ratio for H-FABP < 5.5 was 0.18 (95%CI 0.05 to 0.21). The likelihood ratio for H-FABP between 5.5ng/ml and 15.5ng/ml was 1.05. Diagnostic test characteristics at these thresholds are shown in the table.

Conclusion: In this patient population, H-FABP demonstrates useful negative and positive likelihood ratios at thresholds of 5.5ng/ml and 15.5ng/ml, respectively.

Diagnostic test characteristics of H-FABP, 95% confidence intervals are given in parentheses

Test Characteristic	Threshold = 5.5 ng/ml	Threshold = 15.5 ng/ml
Accuracy	63.5 (56.4-70.1)	91.5 (86.5-94.8)
Sensitivity	89.5 (65.5-98.2)	52.6 (29.5-74.8)
Specificity	60.8 (53.2-67.9)	95.6 (91.2-97.9)
False negative rate	10.5 (1.8-34.5)	47.4 (25.2-70.5)
False positive rate	39.2 (32.1-46.8)	4.4 (2.1-8.8)
Positive predictive value	19.3 (12.0-29.4)	55.6 (31.3-77.6)
Negative predictive value	98.2 (93.1-99.7)	95.1 (90.5-97.6)

30 A Simple Clinical Decision Rule to Predict Bacterial Meningitis in Patients Presenting to the Emergency Department

Drumheller BC, D'Amore JZ, Nelson M, Moise D, Lesser M, Lukin M, Ward MF, Sama AE/North Shore University Hospital, Manhasset, NY

Study Objectives: Differentiation between acute bacterial and viral meningitis remains a clinical predicament for Emergency Physicians when evaluating a patient with signs and symptoms of meningitis. We propose a simple clinical decision rule to differentiate bacterial meningitis from viral meningitis in 100% of patients presenting to the Emergency Department (ED) and receiving a lumbar puncture (LP) to rule out meningitis.

Methods: Multi-center retrospective chart review in the EDs of a suburban tertiary care center (68,000 annual visits) and a suburban community hospital (45,000 annual visits) from 1/1/2002 - 1/1/2006. *Inclusion criteria:* Patients >3 years old presenting with any combination of fever, headache, neck pain/nuchal rigidity, photophobia, sore throat or rash who had an LP performed in the ED. *Exclusion criteria:* Altered mental status, HIV positive, immunocompromised (on chemotherapy or steroids), current antibiotic use, blood/mass on CT. Final diagnosis was determined by a composite end-point of final cerebrospinal fluid (CSF)/blood culture results and discharge/expiration diagnosis. The same four researchers abstracted all charts and resolved any discrepancies by committee. *Statistical Analysis:* Initial univariate analysis employed appropriate tests for continuous and categorical data. Continuous predictors were dichotomized at the optimal point on receiver-operator curves that allowed for discrimination between bacterial meningitis (BM) and viral meningitis (VM). Backwards selection removed variables without contributory significance. Using predictor variables from multivariate analysis, a meningitis scoring system was created. The relative weighting of each variable in the meningitis score was based on its β value in the logistic regression analysis. Sensitivity and specificity were used to establish a cutpoint for the meningitis score.

Results: 457 patients enrolled, mean age 34 (range 3-91) years. 29 (6%) BM, 407 (89%) VM, 21 (5%) none. 100% BM and 78% VM were admitted. The following were strong predictors of BM: colored CSF (OR 39.5, 95% CI: 7.9-196.6), peripheral blood lymphocytes < 10% (OR 10.5, 95% CI: 2.3-48.1), CSF lymphocytes < 26% (OR 11.4, 95% CI: 2.6-50.6), and CSF protein > 70 mg/dL (OR 5.0, 95% CI: 1.1-22.1). Based on the strength of prediction, a scoring system was created with 5 points attributed to colored CSF, 3 points to peripheral blood lymphocytes and CSF lymphocytes, and 2 points to CSF protein levels. The range of the scoring system was 0-13 points. The negative predictive value of a meningitis score of 0 was 100% (95% CI: 99.2-100.0), which corresponds to 51% (206/407) of viral meningitis cases, and 45% (206/457) of all cases. A meningitis score of >3 predicted bacterial meningitis with a sensitivity of 96% (95% CI: 82.2-99.9) (28/29) and a specificity 69% (95% CI: 64.1-73.7) (261/378). *Limitations*: Retrospective design, small number of bacterial meningitis cases, single geographic area.

Conclusion: Using basic findings from blood and CSF, it is possible to accurately identify individuals with no risk (score=0) or high risk (score>3) of bacterial meningitis. Theoretical application of this rule could have reduced viral meningitis admission rates by up to 63%. Prospective validation of this scoring system has the potential to decrease admission rates and unnecessary antibiotic use.

31 BNP as a Modifier for the ADHERE Risk Tree: A Bedside Tool for Mortality Risk Stratification in Emergency Department Patients With Decompensated Heart Failure Requiring Hospital Admission

Stevens AC, Glynn T, Reeves M, White J/Michigan State University Emergency Medicine Residency, Lansing, MI; Department of Epidemiology, College of Human Medicine, Michigan State University, East Lansing, MI

Study Objectives: The ADHERE risk tree was developed in an effort to derive a bedside tool that would predict subsequent in-hospital mortality in patients presenting to the emergency department with acutely decompensated heart failure (ADHF). This tool focused on three easily obtained values; BUN, creatinine, and systolic blood pressure (SBP). The purpose of this study was to determine if BNP would provide additional prognostic information to these three variables in predicting in-patient mortality risk upon initial emergency department presentation.

Methods: This was an IRB-approved case control study. Patients admitted over a 2.5 year period from a community-based emergency department (55,000 annual visits) with a diagnosis of ADHF were identified. Data was abstracted