

Special Topics

Sunday, March 25, 2007, 9:00 a.m.-12:30 p.m.
Hall H

9:00 a.m.

1006-146 Composite Measure Performance in Get With The Guidelines: CAD, Stroke, Heart Failure

Kenneth A. La Bresh, Vince Bufalino, Gregg C. Fonarow, Li Liang, A. Gray Ellrodt, GWTG Steering Committee, Masspro, Waltham, MA, Midwest Heart, Naperville, IL

Background: GWTG is an initiative to improve guidelines adherence in hospitalized patients, in 3 modules (CAD, stroke, HF). The use of composite measures to compare all 3 GWTG modules has not been done.

Methods: GWTG uses a collaborative model with web-based data collection, decision support, and on-demand reporting. Data were collected by hospitals at baseline and subsequent quarters (Q) for pre-specified performance measures (PM). These data were used to construct for each module a defect free measure (% patients who receive all eligible PM) and a composite measure (CM) (% successful execution of each opportunity across all PM for that module). Time trend is assessed with repeat measure analysis to evaluate improvement in sites with at least 30 pts per Q from at least 30 sites for each Q. This resulted in 15 Q data for CAD, 12 Q data for stroke and 3 Q data for HF.

Results: Changes in defect free care were similar in all modules from baseline to Q3: CAD 8.7% Stroke 6.6%, and HF 9%; CM: CAD 4.9%, Stroke 4.4% and HF 5.7%. In the longer running CAD and stroke programs continued improvement was seen with sites achieving defect free scores of 65.3% for CAD at Q15 and 73.9% at Q12 for Stroke and respective composite scores of 85.4% and 88.7%.

Conclusions: GWTG hospitals produce comparable improvement in defect free and CM performance over time in CAD, Stroke or HF patients. Improvement is sustained and continues for up to 15 quarters (CAD). Despite this trend of improving care, more work is needed to implement high reliability strategies.

CAD, Stroke, and Heart Failure Performance Over Time

| | Baseline | Q1 | Q2 | Q3 | Q4 | Q8 | Q12 | Q15 | p |
|-----------------|----------|--------|--------|--------|--------|--------|-------|-------|---------|
| CAD Pt n | 7,710 | 22,163 | 23,606 | 23,529 | 21,535 | 15,999 | 8,977 | 2,876 | |
| Site n | 257 | 216 | 224 | 224 | 211 | 153 | 91 | 30 | |
| Defect Free (%) | 46.9 | 52.2 | 53.3 | 55.6 | 57.4 | 60.3 | 62.8 | 65.3 | <0.0001 |
| Composite (%) | 77.0 | 79.5 | 80.6 | 81.9 | 83.2 | 84.8 | 86.0 | 85.4 | <0.0001 |
| Stroke Pt n | 7,980 | 17,183 | 18,109 | 17,890 | 16,608 | 9,448 | 3,385 | | |
| Site n | 266 | 209 | 224 | 226 | 205 | 115 | 51 | | |
| Defect Free (%) | 61.4 | 65.8 | 67.4 | 68.0 | 68.4 | 71.0 | 73.9 | | <0.0001 |
| Composite (%) | 81.5 | 84.3 | 85.7 | 85.9 | 85.6 | 87.1 | 88.7 | | <0.0001 |
| HF Pt n | 3,270 | 10,849 | 8,045 | 4,131 | | | | | |
| Site n | 109 | 104 | 88 | 40 | | | | | |
| Defect Free (%) | 55.7 | 57.3 | 58.0 | 64.7 | | | | | =0.0168 |
| Composite (%) | 77.4 | 78.8 | 79.9 | 83.1 | | | | | =0.0007 |

9:00 a.m.

1006-147 The Quality of Care for Patients Hospitalized with Ischemic Verses Nonischemic Heart Failure in the American Heart Association's Get With The Guidelines (GWTG-HF) Program

Kenneth A. La Bresh, Gregg C. Fonarow, Clyde W. Yancy, Nancy M. Albert, A. Gray Ellrodt, Adrian F. Hernandez, Li Liang, Eric D. Peterson, Masspro, Waltham, MA, UCLA Medical Center, Los Angeles, CA

Background: GWTG-HF is an initiative to characterize and improve guidelines use in hospitalized heart failure (HF) pts. While therapies for HF are effective and recommended across etiologies, it is unknown whether quality of care as indexed by specific performance measures (PM) differs by HF etiology.

Methods: GWTG-HF uses a collaborative model, and a web-based tool for data collection, decision support, and on-demand reporting. Data were collected by 146 hospitals on 17,416 pts for 5 pre-specified PM: discharge instructions, LV function measurement, ACEI/ARB, beta blocker (BB), smoking cessation counseling and a defect free measure (DFM) of % pts who receive all of the 5 PM for which they were eligible. PM were analyzed based on ischemic (I) or non-ischemic (NI) etiology and adjusted for pt characteristics and comorbidities.

Results: Pts with I-HF were older (74.5 ± 11.9 vs 70.5 ± 16.4 years), with more renal dysfunction (22.2% vs. 16.2%, p<0.0001), lower % women (44.1% vs. 57.6%, p<0.0001), and more whites (77.4% vs. 64.3%, p<0.0001) compared to the NI-HF group. Adjusted

data demonstrate that BB use was more likely to occur in I (OR 1.20); all other PM and the DFM were similar between the two groups.

Conclusions: I compared to NI etiology of HF is not an independent predictor of quality of care for HF, except for the use of BBs. Higher BB use in the I group may be related to indications for both HF and ischemic heart disease. Further education and process changes should be designed to improve care irrespective of HF etiology.

| | Ischemic 10,312 | Non-Ischemic 7,102 | Odds Ratio Ischemic vs. Non-ischemic | Adjusted OR* (95% CI) |
|------------------------------|-------------------|--------------------|--------------------------------------|-----------------------|
| Measures | Percent Adherence | Percent Adherence | Unadjusted OR (95% CI) | Adjusted OR* (95% CI) |
| Discharge Instructions | 73.8% | 74.1% | 1.05 (0.99-1.12) | 1.02 (0.97-1.08) |
| LV Function Assessment* | 91.6% | 91.1% | 1.02 (0.88-1.17) | 1.04 (0.90-1.20) |
| ACEI/ARB Use | 80.4% | 84.0% | 0.77 (0.67-0.89) | 0.91 (0.78-1.06) |
| Smoking Cessation Counseling | 78.2% | 82.3% | 0.87 (0.75-1.01) | 0.94 (0.79-1.11) |
| Beta Blocker Use | 88.5% | 86.6% | 1.08 (0.94-1.24) | 1.20 (1.02-1.40) |
| Composite | 63.9% | 64.8% | 0.94 (0.88-1.00) | 1.02 (0.95-1.10) |

*Variables in model: Age, Gender, Race(Caucasian,African-American, other), BMI at admission, Anemia, CVA/TIA, Diabetes-insulin treated, Diabetes-non-insulin treated, Hyperlipidemia, Hypertension, Pulmonary, Peripheral Vascular Disease, Chronic Renal Insufficiency (SCR >2), LVEF, Systolic BP at admission, Heart rate at admission LV Function Assessment not adjusted by LVEF

9:00 a.m.

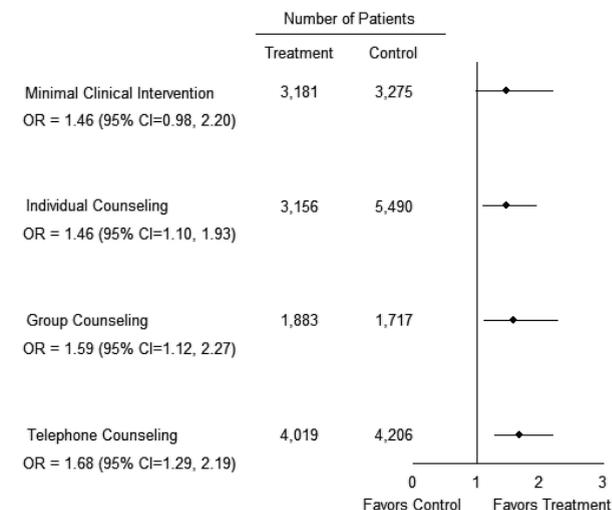
1006-148 A Meta-Analysis of Smoking Cessation Behavioral Interventions

Salvatore Mottillo, Kristian B. Filion, André Gervais, Lawrence Joseph, Jennifer O'Loughlin, Gilles Paradis, Robert Pihl, Louise Pilote, Stéphane Rinfret, Michèle Tremblay, Mark J. Eisenberg, Jewish General Hospital, McGill University, Montreal, PQ, Canada

Background: Previous studies have reported widely varying smoking abstinence rates in populations receiving behavioral interventions for smoking cessation.

Methods: We undertook a meta-analysis of randomized clinical trials (RCTs) evaluating each of 4 behavioral interventions to gain more accurate estimates of their efficacy. The behavioral interventions studied were minimal clinical intervention (brief advice) as well as more resource-intensive interventions including individual, group, and telephone counseling. We searched for all RCTs reporting biochemically-validated smoking abstinence rates at 6 and/or 12 months. Smoking abstinence was examined in a random-effects meta-analysis using the most conservative measure of abstinence reported.

Behavioral Interventions for Smoking Cessation



Results: We identified 51 RCTs randomizing 28,927 patients (minimal clinical intervention: 9 RCTs, n=6,456; individual counseling: 23 RCTs, n=10,646; group counseling: 12 RCTs, n=3,600; telephone counseling: 10 RCTs, n=8,225). All 4 behavioral interventions were efficacious at increasing smoking abstinence rates (figure). Of note, all point estimates of ORs were similar for each of the 4 interventions. However, the confidence interval for minimal clinical intervention included unity.

Conclusion: The use of behavioral interventions results in a modest increase in smoking abstinence rates. Minimal clinical intervention may be as efficacious as more resource-intensive behavioral interventions.

9:00 a.m.

9:00 a.m.

1006-149 Flushing Experience and Discontinuation with Niacin in Clinical Practice

Sachin J. Kamal-Bahl, Douglas J. Watson, Barbara Kremer, Leona E. Markson, Merck & Co., Inc., West Point, PA

Background: While extended-release (ER) niacin is a highly effective agent for raising HDL-C and is proven to reduce CVD risk, it may not be optimally utilized due to niacin induced flushing (NIF), leading to poor patient compliance. We examined NIF and its relationship with ER niacin discontinuation and nonadherence in actual clinical practice.

Methods: We used a pilot tested questionnaire to conduct a telephone interview of 500 patients identified from administrative claims data to have newly initiated ER niacin (mean time between initiation and interview: 9.26 mos [SD=3.29]).

Results: About 27% of the sample reported having discontinued taking niacin at the time of interview ("discontinuers", n=136) with a mean duration of use of 3.2 mos (SD=3.1). About 91% of the discontinuers reported experiencing flushing symptoms and 54% reported 'severe' or 'extreme' flushing (on a scale of none, mild, moderate, severe, extreme). Taking into account the possible benefits of ER niacin, 87% of the discontinuers who had flushing (n=124) reported that the greatest degree of flushing they could tolerate was 'mild' to 'moderate'. Overall, 66% of the discontinuers reported that it would be easier to take ER niacin as recommended if the flushing side effects were reduced. Even among ER niacin "continuers" (n=364) at the time of interview, 82% reported experiencing flushing symptoms and 21% reported 'severe' to 'extreme' flushing. Among the continuers who had flushing (n=299), 21% reported skipping/ delaying doses and 19% reported stopping niacin for > 7 days and then restarting. Overall, 21% of the continuers reported that ER niacin side effects have made them want to stop taking it. Multivariate analyses indicated that flushing symptom severity was a strong predictor of discontinuation ['severe' OR: 3.2, 95% CI 1.4-7.2; 'extreme' OR: 11.3, 95% CI 4.2-30.4] and skipping/delaying of doses ['moderate' OR: 2.4, 95% CI 1.0-5.9; 'severe' OR: 9.4, 95% CI 3.6-24.7; 'extreme' OR: 8.0, 95% CI 1.9-33.5] of niacin.

Conclusion: Since long-term continuous treatment is generally necessary in persons with dyslipidemia, flushing side effects with ER niacin appear to limit the acceptability of this otherwise highly effective therapy.

9:00 a.m.

9:00 a.m.

1006-181 Short-Term Clinical Outcomes of Compensated Heart Failure Patients Undergoing Elective Major Non-Cardiac Surgery

Olivia Xu Cai, Christopher O. Phillips, Daniel J. Brotman, W. H. Wilson Tang, Franklin A. Michota, Christopher M. Whinney, Ashok Panneerselvam, Mario Garcia, Gary S. Francis, Amir K. Jaffer, The Cleveland Clinic, Cleveland, OH

Background: Clinical outcomes of compensated patients with heart failure (HF) due to impaired or preserved ejection fraction (EF) undergoing elective major non-cardiac surgery are not well described.

Methods: We reviewed data for consecutive patients with HF (mean age 69 ± 12 years, 54 % men) who underwent a systematic preoperative optimization by hospitalists from 2003 to 2006. Patients were stratified into impaired (EF ≤ 40%) or preserved ejection fraction (EF > 40%). Propensity matching with multivariate logistical analysis was used to compare outcomes between patients in the two strata.

Results: 562 HF patients (192 EF ≤ 40% and 370 EF > 40%) and 10,693 controls without HF were followed for a median of 1.9 years post-operatively. In propensity analysis of matched cohorts (Table 1), the presence of HF was not associated with significantly increased 30-day post-operative mortality risk. 30-day readmission rate and length of stay (LOS) were higher in HF, particularly in preserved ejection fraction (p=0.04).

Conclusions: In patients with compensated HF undergoing elective major non-cardiac surgery, operative and 30-day mortality were comparable to that of propensity-matched controls. However, patients with HF (particularly in those with preserved rather than impaired EF) were more likely to have longer length of stay and be readmitted at 30-days post-operatively.

Table 1. Clinical Outcomes Among Propensity-Matched HF Patients and Controls

| Outcomes | Impaired Ejection Fraction N=180 | Control† N=180 | Preserved Ejection Fraction N=365 | Control‡ N=365 |
|--------------------------------|----------------------------------|---------------------|-----------------------------------|--------------------|
| 30-day Mortality, % (95% CI) | 1.1 (0.3,3.96) | 0.56 (0.10,3.07) | 1.37 (0.58,3.2) | 0.27 (0.04, 1.53) |
| 30-day readmission, % (95% CI) | 16.1 (11.4,22.2) | 15.56 (10.99,21.56) | 18.6 (14.9,22.90)* | 13.2 (10.10,17.00) |
| LOS (days±SD) | 5.6 ± 0.41 | 5.18 ± 0.42 | 5.77 ± 0.36* | 4.80 ± 0.27 |

*P ≤ 0.05 vs. appropriate propensity-matched control group, †control matched for impaired EF; ‡control matched for preserved EF.

1006-182 Door-to-Balloon Time: An Opportunity to Showcase Quality Improvement Methods

Robert L. Huang, Jeannie Byrd, Ted Speroff, Tom Elasy, Bob Dittus, Marc Mickiewicz, Corey Slovis, Tom DiSalvo, David Zhao, VA Tennessee Valley Healthcare Services, Nashville, TN, Vanderbilt University Medical Center, Nashville, TN

Background: The ACC/AHA 2006 guideline target for ST-elevation myocardial infarction (STEMI) is door-to-balloon time ≤ 90 minutes (min). We hypothesize that quality improvement (QI) methods can decrease door-to-balloon (D2B) time and improve care delivery.

Methods: We studied all STEMI patients presenting to Vanderbilt University Medical Center from July 2005-June 2006. We created a process flow chart and analyzed all D2B process steps including all subinterval time periods. In February 2006, we implemented targeted changes in the process including emergency department activation of the catheterization lab, insistence of 30 min arrival time for the catheterization team, new role assignments for personnel, and use of a diagnostic catheter for non-culprit lesions and use of an interventional catheter for suspected culprit lesions. We used statistical process control (SPC) methods to monitor D2B in real-time, show changes resulted in improvement, and create a dashboard with control limits to identify common and special cause variation.

Results: Our changes led to a 59 min decrease (p=0.0005) in median D2B time from 123 min (interquartile range = 96.5-156 min) to 64 min (interquartile range = 56-94 min). Process flow charting coupled with subinterval time measurement allowed us to identify opportunities to eliminate waste and reduce delays. We then implemented process changes which improved virtually every process step. After implementation, the new SPC charts revealed 1) only common cause variation, 2) a 67% decrease in the new upper control limit and 3) a 50% decrease in the central mean line.

Conclusions: By using QI methods incorporating SPC, we mapped a process, identified bottlenecks and barriers, and implemented systematic process changes which significantly decreased D2B. We used SPC charts to confirm process improvement and provide ongoing control of a complex, inherently variable process. As quality measures align with financial incentives such as pay for performance, cardiologists and administrators will need to systematically utilize QI and SPC methods to analyze, improve and control complex processes of care.

1006-183 Impact of Body mass Index on Mortality in Patients Presenting with Acute ST Elevation Myocardial Infarctions

Mohan Nandalur, Neel R. Patel, Vikram Raya, Zheni Xue, Howard A. Cooper, Washington Hospital Center, Washington, DC, Georgetown University Hospital, Washington, DC

Background: Recent studies have indicated that overweight patients may have better outcomes in the setting of chronic heart disease. We sought to determine if a similar relationship exists among patients with acute ST-elevation myocardial infarction (STEMI).

Methods: 509 consecutive patients with STEMI at a single center were stratified into Body Mass Index categories according to the World Health Organization definitions of normal, overweight, and obese. Baseline characteristics (age, gender, diabetes, smoking, prior CABG, and prior PCI) and clinical outcomes were compared across BMI categories. Multivariate analysis was used to assess the independent relationship between BMI category and in-hospital mortality.

Results: Clinical outcomes are presented in Table 1. Normal BMI patients had a higher rate of in-hospital death than overweight and obese patients (p=.006). Patients with normal BMI's were older (65.9 ± 13.8 yrs) than overweight (61.2 ± 13.2) and obese (58.3 ± 12.6) patients (p<.05). However, on multi-variate analysis, overweight status remained an independent predictor of a lower rate of in-hospital death compared to normal BMI patients (OR 0.42, 95% CI 0.2-0.9, p=0.025). The odds of in-hospital deaths among obese patients was similar to that among normal BMI patients (OR .57, 95% CI 0.27-1.20, p=0.14).

Conclusions: In the setting of STEMI, there appears to be a U-shaped relationship between BMI and in-hospital mortality, with overweight status associated with the lowest risk of death.

Table 1

| EVENTS | Normal Weight-BMI 18.5-24.9 (n=134) | Overweight-BMI 25.0-29.9 (n=185) | Obese BMI > 30.0 (n=186) | p-value |
|------------------------------------|-------------------------------------|----------------------------------|--------------------------|----------------------|
| Hospital Death | 17.2% | 6.67% | 8.38% | .006 |
| CCU death | 12.7% | 5.0% | 7.82% | .047 |
| Need for CABG | 8.2% | 7.6% | 8.6% | Not Significant (NS) |
| Need for Intra-Aortic Balloon Pump | 32.1% | 29.2% | 24.7% | NS |
| Need for Mechanical ventilation | 21.9% | 21.1% | 20.4% | NS |

9:00 a.m.

1006-184 Do Hospitals With Lower Risk-Adjusted Infection Rates Among Coronary Artery Bypass Graft Patients Have More Evidence Based Clinical Processes and Structures In Place?

Phillip P. Brown, Michael J. Mack, Lynn G. Tarkington, April W. Simon, Steve D. Culler, HCA CCMN, Nashville, TN, Emory University Rollins School of Public Health, Atlanta, GA

Background: Post-operative infections among patients undergoing CABG surgery are concerning. This study examines the relationship between Risk-Adjusted Infection Rates (RAIR) and Evidence-Based Clinical Processes and Structures (EBCPS).

Methods: This retrospective study uses data from the Heart Services Standards Database, a web-based survey of 158 HCA hospitals concerning EBCPS; and HCA Casemix Database, an administrative database of all admissions. The study population consists of 75 hospitals that performed ≥ 52 CABG during 2005. Each hospital's RAIR was estimated from a logistic regression model controlling for 19 risk factors. Hospitals, based on their RAIR, were divided into four tiers. The EBCPS activities were classified into three similar groups: Education (10), Protocols (9), and Communications (4). Student-t tests were used to determine if top tier hospitals had more EBCPS than bottom tier hospitals.

Results: The average RAIR for the top tier was 0.8% and 4.6% for the bottom tier. There was no significant difference in CABG volume between the two tiers (122 vs. 157, p=0.223). The top tier had, on average, more EBCPS implemented than bottom tier (13.6 vs. 10.4). This relationship also held for all three groups of activities, although the difference in the number of education activities was not significant (p=0.105).

Conclusion: Top tier hospitals have significantly more evidence-based clinical processes and structures and lower risk-adjusted infection rates than bottom tier hospitals.

Average Number of Evidence-Based Clinical Processes and Structures (EBCPS): Top vs. Bottom Tier

| | Top Tier Hospitals | Bottom Tier Hospitals | p-Value |
|-------------------|--------------------|-----------------------|---------|
| All EBCPS (23) | 13.6±3.8 | 10.4±3.5 | 0.011 |
| Education(10) | 4.6±2.0 | 3.7±1.5 | 0.105 |
| Protocols (9) | 7.1±1.4 | 5.7±2.0 | 0.022 |
| Communication (4) | 2.0±1.0 | 1.1±0.8 | 0.003 |

9:00 a.m.

1006-185 Immediate and Long term Outcomes Related to Retroperitoneal Bleeding Following Percutaneous Coronary Intervention

Mohan Nandalur, Ellen Pinnow, Vikram Raya, Frank Hsu, Joseph Lindsay, Jr., Washington Hospital Center, Washington, DC

Background: Retroperitoneal bleeding (RPB) is a rare complication of cardiac catheterization. We assessed differences in immediate complications and long term outcomes for patients with and without RPB.

Methods: Of 17,650 consecutive patients who underwent PCI at a single center, we identified 86 RPB (.5% incidence). Fisher's exact test was used to analyze acute complications, and a multi-variate analysis was done to assess the significance of RPB on prognosis.

Results: Significant associated hematologic and vascular adverse events are in Figure 1. Short and long term prognosis are presented in Figure 2.

Conclusions: There is an increased incidence of associated acute complications in patients with an RPB. Development of an RPB was also an independent predictor for higher rate of MI and death at 1 month and 1 year.

Figure 1 - Associated Immediate Complications

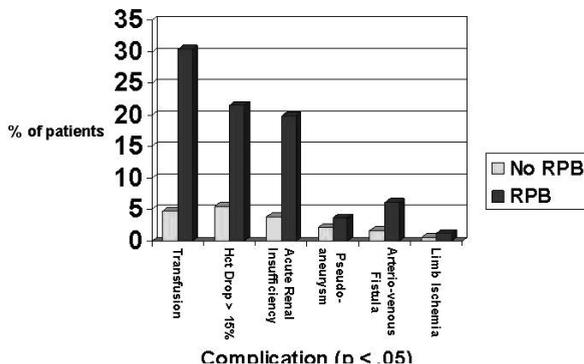
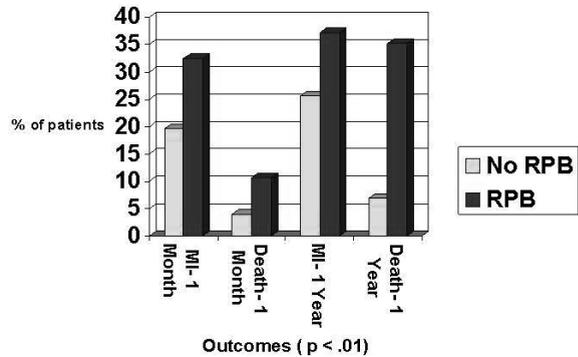


Figure 2 - 1 Month and 1 Year Outcomes



9:00 a.m.

1006-186 We Are Getting Fatter - But Are Our Cath Labs Ready?

Donald L. Lappé, Scott B. Allison, Robert R. Pearson, Tami L. Bair, Heidi T. May, Benjamin D. Horne, Joseph B. Muhlestein, LDS Hospital, Salt Lake City, UT, University of Utah, Salt Lake City, UT

Introduction: In a time when people are gaining weight at epidemic proportions, the ability to perform coronary angiography and interventions with acceptable imaging and clinical results in the obese may be compromised. This population presents a unique and growing dilemma that stretches the limitations of the radiographic equipment with regard to load bearing capacity, x-ray penetration, and image quality, but how many patients are involved?

Methods: Patients (N=26,416) who had angiographic assessment of coronary artery disease (CAD) and weight measurement were entered into the Intermountain Heart Collaborative Study from 1993-2005 and were stratified by year of procedure and the following weight categories: ≤300, 301-350, and >350 pounds (lbs).

Results: Average weight increased from 1993 to 2005: 182.0, 182.0, 180.5, 182.4, 184.7, 185.5, 184.5, 188.9, 187.9, 188.9, 188.3, 188.9, and 189.2 lbs, respectively (p<0.0001). From 1993 to 2005, an increase was observed in the frequency of patients who weighed between 301-350 (0.8%, 0.6%, 0.3%, 0.4%, 0.7%, 1.1%, 0.9%, 1.4%, 1.6%, 1.7%, 1.2%, 1.8%, and 1.7%, respectively) and >350 (0%, 0.2%, 0.3%, 0.4%, 0.4%, 0.7%, 0.3%, 0.5%, 0.3%, 0.4%, 0.4%, and 0.5%, respectively). Males had a greater increase (+13.5 lbs) in mean weight than females (+10.5 lbs). Increasing weight was also associated with diabetes (p<0.0001) and hypertension (p<0.0001) but not hyperlipidemia (p=0.09) or presentation (stable angina vs. unstable angina vs. acute myocardial infarction, p=0.50).

Conclusions: A steady increase in weight was found over the past 13 years, a trend that is projected to continue. Cath labs will need to be properly accommodate this super-sized trend. Weight limitations will need to expand beyond 400-450 lbs and x-ray generators capable of higher than 100KW outputs will be required. With increased radiation dose (often 3-4 times that of a normal BMI) and repeat procedures now the norm to treat progressive CAD, the cumulative radiation exposure greatly increases risk of malignancy for this population. In addition, increasing occupational exposure to Cardiologists and staff from scatter radiation may reduce the numbers of patients able to be treated.

9:00 a.m.

1006-187 Impact of Physicians' Gender on Blood Pressure Control in different Age Groups of Treated Hypertensives in Swedish Primary Health Care

Gunilla I. Journath, Holger Theobald, Mai-Lis Hellénius, Peter M. Nilsson, Dept of Neurobiology, Caring Sciences and Society, Karolinska Institutet, Stockholm, Sweden, Dept of Clinical Sciences, University Hospital, Malmö, Malmö, Sweden

Background: The care of treated hypertensives aims to optimise the control of blood pressure and other risk factors in order to lower the total cardiovascular risk. Little is known whether the gender of the physicians have any impact on this. The objective was to study the effect of the primary care physicians' (PCPs) gender on blood pressure control in treated hypertensive men and women in different age groups.

Methods: An open, cross-sectional survey performed in Sweden during 2002-2005. Data were consecutively collected from medical records and registered in a web-based form. A total of 265 PCPs (71 % men) and 6537 hypertensive patients (48% men), with a mean age of 51.8 (SD 6.1) and 66.2 (SD11.8) years respectively, were studied. Subjects were stratified for gender of the PCPs and patients as well as age-groups, <56, 56-70 and > 70 years of age.

Results: Female patients 56 years or older had more often a well-controlled blood pressure (systolic/diastolic blood pressure <140/90 mmHg) when treated by female PCPs compared to when treated by male PCPs (56-70 years: 36% vs. 28%, p<0.01, >70years: 25% vs. 16%, p<0.001). Female physicians both male and female patients 56 year and older had a more well-controlled total cholesterol (<5 mmol/L) compared to when treated by male physicians (56-70 years: men 43% vs.34%, p<0.01, women 30% vs. 24%, p<0.05, >70 years: men 49% vs. 38% p<0.05, women 33% vs. 21%, p<0.001). LDL-cholesterol was more well-controlled (<3.0 mmol/L) in the age group 56-70 years both for male (43% vs. 35%, p<0.01) and female patients (40% vs.33%, p<0.05), and for male patients >70 years (51

% vs. 40%, $p < 0.05$) when treated by female PCPs compared to male PCPs.

Conclusions: When treated by female PCPs, female hypertensives 56 years or older have a more well controlled blood pressure compared to when treated by male PCPs. Patients of both gender had more well-controlled lipids when treated by female physicians compare to when treated by male physicians. Gender disparities should be minimised.

9:00 a.m.

1006-188

Protective Effect of Chronic Statin use against Post Discharge Stroke after CABG in Patients with Acute Coronary Syndromes

Sahand Rahnema-Moghadam, David Armstrong, Apurva Motivala, Ameeth Vedre, Umesh Tamhane, Aubrey Timm, Eva Kline-Rogers, Vijay S. Ramanath, James Froehlich, University of Michigan Medical Center, Ann Arbor, MI

Background: Patients who undergo Coronary Artery Bypass Graft (CABG) surgery have a higher rate of follow-up (f/u) stroke than non-CABG patients. The role of medications in stroke prevention for these patients is not fully understood. We examined the association between chronic use of statins on the incidence of post-CABG stroke in patients with acute coronary syndromes (ACS).

Methods: We identified 3279 consecutive patient admissions with a discharge diagnosis of ACS at the University of Michigan between 1999 and 2005. Data were collected using a standardized dataform. Data included demographics, medications on admission, at discharge, in-hospital management and outcomes at discharge and at 6-12 months post discharge. Chi square and Fisher's Exact Chi Square tests examined the relationship between f/u stroke (6-12 months post discharge), CABG (in-hosp) and chronic statin use. Logistic regression was used to test for significant interactions as well as to adjust for variables that had been significant in bivariate analysis. If a significant interaction was found, stratified logistic regression was carried out to characterize the nature of the interaction.

Results: A significant relationship existed between chronic statin use and incidence of stroke in patients that underwent CABG. Stratification revealed that patients not on chronic statin therapy had a higher f/u stroke rate even after adjusting for age and gender (OR 4.33, $p = 0.01$). Only age was a significant predictor of follow-up stroke.

Conclusions: Pre-operative statins are associated with a lower risk of follow-up stroke after CABG for patients admitted with acute coronary syndromes. More and larger studies are needed to confirm these results.

9:00 a.m.

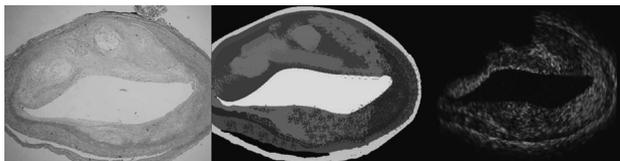
1006-189

An Intravascular Ultrasound Simulator of Coronary Plaques Based on Histopathology

Nico Bruining, Steffen Groot, Charl P. Botha, Frits H. Post, Ronald Hamers, Erasmus MC, Rotterdam, The Netherlands, TU-Delft, Delft, The Netherlands

Background: Intravascular Ultrasound (IVUS) is the reference method to study coronary plaques and is the imaging tool in natural history and progression-regression studies. IVUS derived plaque compositional techniques are available (IVUS-VH) but still under investigation. The validation method to evaluate the capabilities of plaque tissue composition imaging by IVUS is ex-vivo imaging of coronary specimens followed by histopathology. However, this is difficult, time-consuming and not all pathologies can be covered. An unambiguous tool to evaluate and validate grey-scale coronary plaque imaging by IVUS is still lacking. Therefore, an IVUS grey-scale image simulator was developed using color-coded histopathology or pathology drawings as input.

Methods: a simulator using a combination of scatters and ray tracing was developed using Matlab (The Mathworks, Natick, MA, USA). Ex-vivo specimens imaged first with IVUS and which later underwent histopathology was used for development. The grey-scale images of the real- and the simulated IVUS of the specimens were used to tune the simulator.



Results: The simulator is capable of generating realistic clinical looking images when compared to real IVUS. It has the flexibility to generate a large variety of pathologies with different aspects of ultrasound behavior in the field of IVUS (figure).

Conclusion: Simulation of grey-scale IVUS images of coronary pathologies based on histopathology is possible and could be a valuable validation and teaching tool.

9:00 a.m.

1006-190

A New Automated Method For Quantitative Coronary Plaque Compositional Imaging By Multi-slice Computed Tomography: An Ex-vivo Feasibility Study

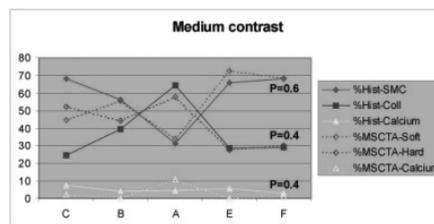
Nico Bruining, Stefan Verhey, Michiel Knaapen, Pamela Somers, Jurgen Lighthart, Evelyn Regar, Filippo Cademartiri, Glenn van langenhoven, Ronald Hamers, Erasmus MC, Rotterdam, The Netherlands, Antwerp Cardiovascular Institute Middelheim, Antwerp, Belgium

Background: Multi-slice computed tomography coronary angiography (MSCT-CA) is making rapid progress into clinical practice. Although only recently introduced it seems to become a standard imaging tool for diagnosing patients with suspected cardiovascular

diseases. The big advantage over coronary angiography is the capability of also visualizing coronary plaques. However, would it be possible to determine plaque tissue composition by MSCT-CA?

Material and methods: Explanted human LAD's were imaged with both MSCT-CA, (Sensation 16, Siemens, Germany) applying different concentrations of contrast, and optical coherence tomography (OCT). OCT, with an image resolution similar to that of histology, was used to register MSCT results to quantitative three-dimensional histology. Histology was performed at 5 different sub-segments of 15 histology slices each.

Results: The individual results of each sub-segment were averaged for both techniques and are presented in the figure. There were no statistical significant differences between both techniques. The measurements with saline instead of a medium contrast concentration (HU=300), to explore the influence of the contrast onto the HU appearance of the plaque, showed similar results. In sub-segment C a deviation was found due to a small plaque size, difficult to detect by MSCT-CA.



Conclusion: This ex-vivo feasibility study of quantitative plaque compositional imaging by MSCT-CA showed promising results, encouraging further in-depth research.

9:00 a.m.

1006-191

The Safety of High Risk Elective Percutaneous Coronary Interventions in a Remote Center a few hours away from Cardiac Surgical Support

Brendan Gunalingam, Andrew Hill, Nicholas Wilkes, Fraser Bates, Dennis Wang, Gosford Hospital, Gosford, Australia

Background: The current American College of Cardiology guidelines recommend that elective percutaneous coronary interventions (PCI) should not be performed in institutions without on-site cardiac surgery. We sought to determine the safety of PCI without cardiac surgical support on-site and report the results of the first 921 elective procedures performed at our institution which is a remote centre 80 kilometres (50 miles) from the nearest cardiac surgical facility.

Methods: Between September 2002 and April 2006 a total of 921 elective PCI procedures were performed in 814 patients at our institution. Patients were not selected and included both high and low risk cohorts. Clinical and procedural outcomes were recorded and prospectively followed. An ambulance was not available on stand-by for emergency transfer and so it was expected that if transfer to a cardiothoracic surgical unit was required, it would reflect "real world" experience and could take a few hours. All 3 Interventionalists participating in the program were experienced "high-volume" operators who also performed procedures at other institutions.

Results: 1 138 vessels were treated & 1 429 stents deployed. A 95% procedural success rate was recorded. Males comprised 69.3% with a mean age of 62.9 years. The mean age for females was 69.3 years. Complex PCI was performed with multi-vessel PCI in 13%, Bifurcation PCI in 8%, Chronic total Occlusions (CTO) in 5%, Saphenous vein graft interventions in 5%, Unprotected Left Main interventions in 0.8% and rotational atherectomy in 0.8%. Of the cohort, 75% of the lesions treated were either ACC/AHA type B or C lesions.

In the 921 elective procedures the following major complications occurred: 1 death, 6 sub acute stent occlusions, 1 case of contrast nephropathy requiring short-term dialysis, 2 cases of cardiac tamponade, 2 significant femoral pseudo-aneurysms and 1 misplaced stent. There were no urgent transfers for CABG surgery to salvage a complication of PCI.

Conclusion: PCI including high risk elective procedures can safely be performed without on-site cardiac surgery provided the program is restricted to experienced & "high-volume" Interventionalists.

9:00 a.m.

1006-192

The Blog Web Site: a New Educational Tool for Cardiology

Vesselin Dimov, Wassim Fares, Joshua Schwimmer, Shahid Randhawa, Ajay Kumar, Ashish Aneja, J. Michael Koch, Richard Christie, Cleveland Clinic, Cleveland, OH, Case Western Reserve University (St. Vincent/St. Luke) Internal Medicine Residency Program, Cleveland, OH

Background: A blog is a web site which requires only basic computer skills to create and maintain. Most blogs have a commenting feature which allows authors to receive immediate feedback from readers. The population of blogs on the Internet has grown explosively over the last 2 years, doubling in size every 5 months. Few studies have explored the effect of this new medium on medical education.

Methods: Our goal was to evaluate the impact of a blog as an educational medium for cardiology. Clinical Cases and Images (clinicalcases.org) was created in 2005 at a teaching hospital with the goal of enhancing the medical education of internal medical residents by publishing cases in cardiology and other specialties. The authors were members of the Section of Hospital Medicine at the Cleveland Clinic and faculty members at Case Western Reserve University (CWRU). The blog was provided and hosted free of

charge by Blogger.com, a service owned by Google, Inc. Electrocardiograms (ECGs) and other clinical images were scanned and uploaded to the web site. Audio commentary on each ECG was recorded by residents and cardiologists by making 5-minute long phone calls which were automatically converted to audio files posted to the blog website. The source and number of visits to the blog were recorded. The medical residents at CWRU/ St.Vincent were anonymously surveyed regarding the blog usefulness.

Results: After 18 months, the blog received 780,000 page views and had 270,000 visitors from more than 90 countries. Most of the visitors came from the British Medical Journal and Medscape.com, which reviewed the blog favorably; search engines; and from links posted on other medical web sites. The blog has been one of the top Google search results for "cardiology clinical cases", just behind the official web site of the American College of Cardiology, among more than 4.9 million web sites.

All residents rated the web site as useful, 78% stated that it had changed the way they learn in a positive way, and 87% would like to participate in expanding the blog. Residents voted the ECGs with audio commentary as the best feature of the blog.

Conclusion: A web blog is an easy-to-use medium for publishing that has the potential to enhance education in cardiology.

9:00 a.m.

1006-193 Rapid Rise in Cardiac Auscultation Skill After a Single 90 Minute Intervention: A Quality Improvement Study

Michael J. Barrett, Archana Saxena, Katherine A. Thomas, Temple University School of Medicine, Philadelphia, PA

Background: The ability of non-cardiologists to recognize common heart murmurs is only fair at best. Recent research suggests that cardiac auscultation is, in part a technical skill that improves dramatically with intensive drilling and repetition. In this quality improvement study, we measured the effect of listening to intensive repetition (400 times) of 5 common heart murmurs during a single 90 minute training session in a group of general internists.

Methods: A group of 149 general internists took a pretest consisting of common heart murmurs played in random order. Immediately following the test, they listened to auditory recognition exercises of five heart murmurs including aortic stenosis, aortic regurgitation, mitral stenosis, mitral regurgitation and innocent systolic murmur in a monitored session. These auditory recognition exercises consisted of 400 repetitions of each of the five murmurs played during a single 90 minute audio session. Immediately following the intervention, all participants took a post test consisting of the same murmurs played in a random order. The murmurs used in the training session were simulated heart sounds while the murmurs used in both pre and post tests were high quality recordings of human heart sounds.

Results: On the pretest, the average correct score was 60 +/-15% and increased significantly to 80.5 +/-15% on the post test, p< .001 by paired t-test. These posttest scores were similar to those reported for cardiologists.

Conclusions: Auditory recognition exercises of five common cardiac murmurs delivered in a single 90 minute session significantly improve cardiac auscultation skill in general internists. These results support the hypothesis that this is a technical skill which can be readily mastered by non-cardiologists using intensive repetition and drilling in a short timeframe.

9:00 a.m.

1006-194 Web-based Recruitment Facilitates Collection of Patients With Peripartum Cardiomyopathy

Jordan G. Safirstein, Joonun Choi, Angela Ro, Sree Grandhi, Eileen Hermance, Cezar Staniloae, Saint Vincent's Catholic Medical Center, New York, NY

Background: Peripartum cardiomyopathy (PPCM) is a rare disease associated with significant morbidity and mortality. Low prevalence, geographic dispersion and high cost limit the establishment of a large database for PPCM. While more than 100 million Americans use the Internet to seek health information, a web-based tool to recruit, enroll, and survey PPCM survivors is logical but not yet described.

Methods: In collaboration with the largest PPCM education and support website we created an on-line information portal describing our retrospective, survey-based study. Informed and HIPAA consent documents were available online for prospective participants. Once enrolled, participants were asked to complete a standardized questionnaire detailing their PPCM clinical presentation, timing of diagnosis, postpartum management, subsequent pregnancies and psychosocial impact. Accuracy of diagnosis was confirmed via echocardiographic data.

Results: Over the course of nine months more than 4 million hits to the PPCM education and support website were recorded from over 60 different countries and 6 continents. 390 unique visitors requested information regarding our study and 119/235 (50.6%) visitors who downloaded consent documents completed the enrollment process electronically, including women from 32 different states and 3 different countries. Mean rate of enrollment was 13.2 participants per month and is ongoing. At this rate of enrollment we will exceed the largest cohort of PPCM patients reported to date in less than twelve months. Limitations of this method include selection bias as enrollment requires use of the Internet.

Conclusions: We report a novel method for recruiting, enrolling and surveying patients with PPCM via the Internet. Web-based recruitment facilitates the collection of data in patients with rare diseases, such as PPCM, more efficiently and at much lower cost than traditional methods. This unique modality will enable physicians to use a single source outcome tool to assess treatment outcomes, experiences from subsequent pregnancies and morbidity associated with PPCM as well as other rare diseases.

1204

Special Topics

Sunday, March 25, 2007, 9:00 a.m.-1:00 p.m.

Hall H

Noon

1204-262 Real-Time Assessment of Clinical Appropriateness in Ad Hoc Percutaneous Coronary Intervention for 1,211 Consecutive Patients

Michael J. Hearne, Mirle A. Kellett, Jr., Thomas J. Ryan, Jr., David J. Malenka, Catholic Medical Center, Manchester, NH, Maine Medical Center, Portland, ME

Background: Health care purchasers are increasingly interested in the appropriateness of clinical care but current guidelines are difficult to operationalize in a format that lends itself to the a priori determination of appropriateness.

Methods: Guidelines define PCI appropriateness on the basis of 3 variables: clinical presentation, evidence of ischemia, likelihood of procedural success. Clinical presentation and evidence of ischemia are known prior to angiography and can be used to evaluate appropriateness of ad hoc PCI. We adapted the existing PCI guidelines using these 2 variables and piloted this tool at 2 centers on 1211 patients.

Results: Table. Of 1211 procedures, 1179 (97%) could be classified using this tool and 32 (3%) could not. There were 598 procedures (51%) classified as appropriate by clinical presentation alone. The other 581 (49%) required additional evidence of ischemia to be classified as appropriate. This was present for 472 (81%) but not for 109 (19%). Of these 109, 74 (68%) had low risk unstable angina for which catheterization-PCI is an alternative to stress testing (Class IIa). Appropriateness was questionable for only 35 (3%) of patients.

Conclusions: In this pilot project we showed that clinical appropriateness can be evaluated prior to angiography in the vast majority of ad hoc PCI procedures and that appropriateness criteria are well-met. Future research should focus on those patients difficult to classify and on how to integrate the likelihood of procedural success.

| Clinical Presentation | # of Patients | Evidence of Ischemia |
|--------------------------------------|---------------|----------------------|
| Ischemic by Definition | | |
| Cardiogenic Shock | 16 | - |
| Primary PCI | 160 | - |
| Rescue PCI | 19 | - |
| Unstable Angina-High Risk | 228 | - |
| Post MI Angina | 71 | - |
| Post MI Anatomy | 66 | - |
| Restenosis | 38 | - |
| Requires Evidence of Ischemia | | |
| Unstable Angina-Low Risk | 248 | 174 |
| Stable Class II or III Angina | 269 | 246 |
| Atypical Chest Pain | 26 | 25 |
| Asymptomatic | 38 | 27 |
| Other | 32 | 0 |

Noon

1204-263 Patient Radiation Dose in Invasive Cardiology

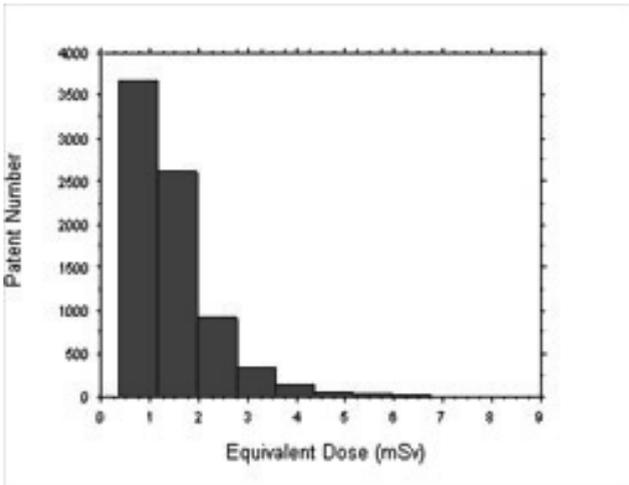
Jerome Clerc, Catherine Le Gac, Bernard Glatt, Thierry Royer, Bernard Chevalier, Philippe Guyon, Centre Cardiologique du Nord, Saint Denis, France, Centre Hospitalier de Creil, Creil, France

Background: Patient radiation protection needs to be promoted. However pt dosimetry audit is not a current practice in Cardiology. The aim of this study is to evaluate the radiation exposures during invasive coronary investigations.

Methods: Between 2002 and 2005 skin dose absorption and body equivalent dose (biological effect) were measured and analyzed for 7803 consecutive procedures (6703 pts) performed on the same flat panel detector system. Mean age was 64±12 years (74% men) corresponding to a standard French population investigated for coronary and valvular disease (LM 5%, normal coronary angiogram 25%, one vessel lesion 27%, two 21%, three 29%, valvular disease and others 8%).

Results: Equivalent doses were respectively, 1.08±0.44 mSv (0.45-7.63) for the coronary angiograms (n=4427), 1.72±1.02 mSv (0.48-5.47) for the PTCA (n=738), 2.05±0.97 mSv (0.48-8.35) if the 2 phases were performed in the same session (n=2597).

Male gender, age, body mass index, previous bypass, cardiogenic shock, emergency, left ventriculography, aortography, other vessel angiographies, PTCA site number, chronic total occlusion, frame speed acquisition, junior operators were associated with patient radiation dose increasing. No radiation related complication could be observed during the hospitalisation phase.



Conclusions: Pt radiation doses are not high in invasive cardiology suggesting a low determinist and stochastic effects. However reducing dose is a daily goal, and significant gains could be expected.

Noon

1204-264 Comparison of Hospital Door-to-Balloon Times Reported by Centers for Medicare and Medicaid Services and the American College of Cardiology-National Cardiovascular Data Registry: Apples and Oranges?

Brahmajee K. Nallamothu, Yongfei Wang, Elizabeth H. Bradley, Jephtha P. Curtis, John S. Rumfeld, Frederick A. Masoudi, Harlan M. Krumholz, on behalf of the NCDR(tm), University of Michigan, Ann Arbor, MI

Background: Hospital performance on door-to-balloon (DTB) times in patients undergoing primary PCI is now publicly reported and may be tied to future pay-for-performance programs. However, no assessment of the "comparability" of hospital DTB times measured across different national registries has been performed.

Objective: To compare hospital DTB times between the Centers for Medicare & Medicaid Services (CMS) data and the ACC National Cardiovascular Data Registry (NCDR).

Methods: CMS and NCDR data collected from July 2004 to July 2005 on patients undergoing PCI with ST-elevation MI were used. For the 185 hospitals that reported to both data sources, we calculated 1) hospital median DTB times and 2) the percentage of patients undergoing PCI within 90 mins. We then ranked hospitals into quintiles of performance based on these measures using CMS and NCDR data. Comparability between the 2 data sources was assessed by determining how often hospitals remained within similar quintiles of rankings and by constructing Bland-Altman plots.

Results: When rankings by hospital median DTB times in CMS and NCDR data were directly compared, only 73 (40%) hospitals were ranked in the same quintile in both data sources, and 53 (29%) differed by >2 quintiles. The results were slightly more concordant at extremes of performance: e.g., among the 37 hospitals identified in the top-performing quintile by CMS data, 21 (57%) were in the top-performing quintile by NCDR data while 10 (27%) differed by >2 quintiles. Bland-Altman plots demonstrated that the 95% limits of agreement for hospital median DTB times between the 2 data sources were -27 to +33 mins, suggesting that differences in hospital median DTB times derived from the data sources may be up to 60 mins at the same facility. Similar findings were noted when we evaluated hospital performance based on the percentage of patients undergoing PCI within 90 mins.

Conclusions: Substantial differences exist in hospital DTB times reported by CMS and NCDR. Understanding reasons for these differences and their impact on hospital rankings is critical for public reporting and pay-for-performance programs to move forward.

Noon

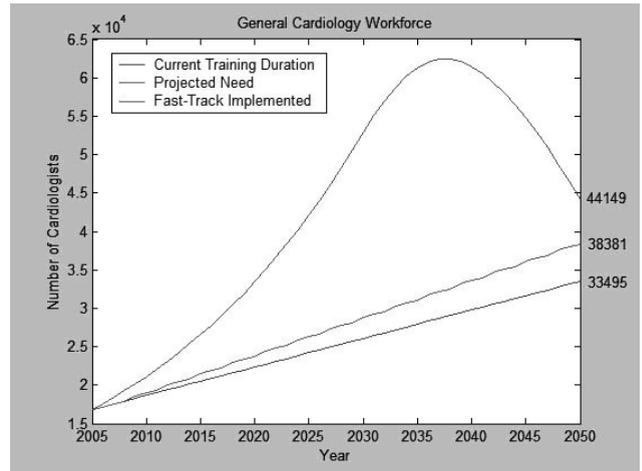
1204-265 Projecting an Impending General Cardiology Workforce Shortage

Jeffrey L. Williams, University of Pittsburgh, Pittsburgh, PA

Background: There is a declining number of US medical graduates and those matching in Internal Medicine residencies. It was hypothesized this decline combined with an increasingly complex cardiovascular disease patient requiring the care of multiple, distinct cardiovascular specialists will lead to a shortage of General Cardiologists (GC's). A model was developed to project need for general Cardiologists from 2005-2050.

Methods: A model was developed using Matlab (Mathworks, Inc., Natick, MA) assuming the baseline number of first-, second-, and third-year GC fellows numbered 709, 726, and 725, respectively, and the current total of existing GC's was 16800. The growth in need for GC's was estimated by incorporating the effect of retirement, prevalence of heart disease, and physician-patient load. Fast-tracking was defined as 2 years of General Cardiology followed by 2 years of EP or Interventional Training.

Results: At the peak demand in the year 2038 (see Figure), there is a projected need for 62,452 GC's. Current training durations would result in 29043 GC's and Fast-Tracking would result in 32533 GC's.



Conclusions: There is evidence of an impending shortage of GC's that will peak in 2038 resulting in only 46.5% of the projected need for GC's. This may result from a complex cascade of declining US medical graduates and those matching in Internal Medicine residencies, combined with an increasingly complex cardiovascular disease patient requiring the care of multiple, distinct cardiovascular specialists.

Noon

1204-266 Lung Echo and Cardiac Doppler Study Can Diagnose the Etiologies of Acute Respiratory Distress in the Emergency Room

Masao Takeda, Hiroshi Ito, Katsuomi Iwakura, Shigeo Kawano, Atsunori Okamura, Toshiya Kurotobi, Yasushi Koyama, Motoo Date, Koichi Inoue, Kenshi Fujii, Sakurabashi Watanabe Hospital, Osaka, Japan

Background: Ultrasound lung comet (ULC), that consists of multiple comet-tails fanning originating from the lung surface, are simple echographic sign of lung edema. It, however, are also observed in cases of organic lung disease. In this study, we investigated whether we can accurately diagnose etiology of acute respiratory distress (ARD) with the combination of ULC and Doppler study in emergency setting.

Method: Study population consisted of 32 patients admitted our CCU complaining of ARD. We performed ultrasound scanning from the third intercostals space on the anterior axial line and counted number of ULC. We also measured the ratio of peak-E velocity to early diastolic mitral annulus velocity, E/e', and regarded E/e' > 15 as a sign of high pulmonary capillary wedge pressure.

Results: ULC was detected in all patients. Number of ULC increased with an increase in Killip class (Ivs. II vs. III vs. IV: 1.0 vs. 2.0 vs. 2.3 vs. 3.4, p<0.0001). Twenty-two patients showed E/e' > 15 and there was correlation between number of ULC and E/e' in them (r=0.62, p<0.02). E/e' and number of ULC decreased (pre vs. post, 22.2vs. 15.5, p=0.002, 2.6 vs. 0.5, p=0.002, respectively) after treatment. ULC disappeared in 15 patients (68.2%) after treatment. Ten patients showed E/e'<15 and number of ULC was lower compared those with E/e' > 15 (1.3 vs. 2.6, p=0.02). 8 patients had only one ULC. All of them showed pneumonia and its shadow extended to the sub-pleural lesion diagnosed with lung CT. ULC disappeared after treatment of pneumonia that was inferior to fibrosis confirmed with radiologic study.

Conclusion: 1) ULC is common findings in patients with ARD and appears not only in lung edema due to heart failure but also in pneumonia. 2) Additional measurement of E/e' is useful to make differential diagnosis of ARD caused by lung edema.

ACC.POSTER SESSION

1012

Special Topics

Sunday, March 25, 2007, 1:30 p.m.-5:00 p.m.
Hall H

1:30 p.m.

1012-146

Lower Rate of Dietary Advice Given to Heart Failure Patients with Preserved Systolic Function is Associated with Adverse Short-Term Clinical Outcomes After Hospital Discharge

Scott L. Hummel, Cecilia K. Montoyo, Anthony C. DeFranco, Stephen Skorcz, Theresa K. Aldini, Vipin Kheterpal, Daniel Lee, Japhet Joseph, Trissa Torres, Suresh Gupta, Laura Carravallah, Michael James, Jeffery Harris, Frederick VanDuyne, Rodney Diehl, Kim A. Eagle, Todd M. Koelling, University of Michigan, Ann Arbor, MI

Background: It is not known whether application of ACC/AHA disease specific performance measures primarily designed for systolic heart failure (SHF) benefits patients with heart failure and preserved systolic function (HFPSF), although many of these measures are recommended regardless of ejection fraction (EF).

Methods: The ACC Guidelines Applied in Practice - Heart Failure (GAP-HF) study tracked guideline-based quality improvement metrics and clinical outcomes in HF patients admitted to 15 community hospitals. We performed Chi-square analysis to compare guideline adherence in patients with systolic heart failure (SHF, EF < 40%, n=1420) and HFPSF (EF ≥ 50%, n=1079). We then performed binary logistic regression to assess the relationship between the HF quality indicators and 30-day clinical outcomes in patients with HFPSF.

Results: At discharge, patients with HFPSF were less likely to receive written instructions for daily weights (35.2% vs 42.0%), activity level (83.1% vs 88.4%), and low sodium diet (48.3% vs 56.3%) than patients with SHF (p < 0.05 for all). No difference was found in the rates of patients receiving appropriate information regarding discharge medications (65.2% vs 68.7%), follow-up appointments (97.0% vs 97.2%), or a plan for what to do if their symptoms worsen (48.5% vs 50.6%). Patients with HFPSF were less likely to receive complete (all six elements) discharge instructions than patients with SHF (24.5% vs 30.9%, p = 0.002). Multivariable regression analysis revealed that documentation of advice given to follow a low sodium diet was strongly associated with a lower risk of adverse outcomes at 30-days post discharge (death at 30 days - (OR, 95% CI, p value) 0.246, 0.098 - 0.620, 0.003; readmission at 30 days - 0.578, 0.362 - 0.925, 0.022; death or readmission at 30 days - 0.404, 0.256 - 0.636, <0.001)

Conclusions: Appropriate HF discharge instructions are documented less frequently in the management of HFPSF compared to SHF. The prescription of a low-sodium diet is independently associated with decreased event rates in the 30 days following admission for HFPSF. Further study is needed to determine if this relationship is causal or simply a marker of better overall care.

1:30 p.m.

1012-147 Effect of Diabetes and Glomerular Filtration Rate on 6-month Outcomes in Patients Undergoing Cardiac Catheterization

Tessa Dake, Sahand Rahnama-Moghdam, Eva Kline-Rogers, Susie M. Hiniker, Fadi Saab, Apurva Motivala, David Armstrong, Aubrey Timm, James Froehlich, University of Michigan Medical Center, Ann Arbor, MI

Background: Nearly 1.3 million Americans are diagnosed with diabetes mellitus (DM) yearly, increasing their risk of a myocardial infarction (MI) two to three fold. DM is also the leading cause of end stage renal disease (ESRD), resulting in 44% of new cases annually. In kidney failure, decreased glomerular filtration rate (GFR) (below 60 mL/min) is associated with an increased risk for major adverse coronary events (MACE) after percutaneous coronary intervention. There is significant overlap between patients with DM and renal disease in diabetic nephropathy making it difficult to determine how these two disease pathologies interact and relate to adverse cardiac events. When controlling for these overlaps, we propose that the relationship between GFR and MACE, following cardiac catheterization, is dependent upon diabetic status.

Methods: We evaluated 3209 consecutive patients with acute coronary syndromes admitted to the University of Michigan between September 1999 and October 2005. For all patients undergoing cardiac catheterization, we analyzed the DM and non-DM populations, dividing them into quartiles according to GFR (<=40, 41-60, 61-80, >80 mL/min) to test for interaction and independent trends. We also combined the DM and non-DM populations to test for other significant factors, including: gender, history of MI, percutaneous coronary intervention, coronary artery bypass graft, DM, hyperlipidemia, hypertension, and age.

Results: Having DM increased risk of MACE (OR 1.4, CI: 1.08, 1.69), as did a history of MI (OR 1.3, CI: 1.05, 1.71). Moderate and severe renal impairment also increased risk of MACE (OR 1.6, CI: 1.14, 2.10; OR 1.5, CI: 1.03, 2.15 respectively). Female gender was also found to be a significant risk factor for increased MACE following cardiac catheterization (OR 1.3, CI: 1.02, 1.58). An interaction test between GFR and DM was not significant. This shows that GFR and DM status interact additively, not multiplicatively, as risk factors for MACE.

Conclusions: GFR and cardiac outcomes after cardiac catheterization are independent of DM status. Our data support previous findings of increased risk of MACE below a GFR of 60 mL/min, and show increased risk for females.

1:30 p.m.

1012-148 Association Between Admission Neutrophil to Lymphocyte Ratio and 6-Month Mortality in Patients with Acute Coronary Syndrome

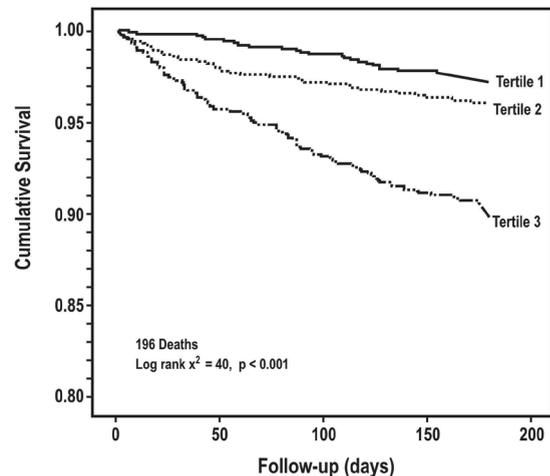
Sanjay Aneja, Daniel Montgomery, Rebecca Juliar, Charles Burney, Aubrey Timm, Jessica Socha, David Armstrong, Kim A. Eagle, Hitinder Gurm, University of Michigan Medical Center, Ann Arbor, MI

Background: Neutrophil to lymphocyte ratios (NLR) as measured by a differential cell count has emerged as a powerful predictor of mortality in patients undergoing PCI. We investigated the utility of admission NLRs in predicting outcome in patients with acute coronary syndromes.

Methods: We followed 3500 patients admitted to the University of Michigan Health Systems with a diagnosis of ACS from 1/1/1999 to 10/14/05. A differential white cell count was available in 2980. The primary outcome of our analysis was all-cause mortality and was obtained by 6-12 month phone follow-up or Social Security Death Index search. Patients were divided into tertiles of NLR and a Kaplan-Meier curve was used to plot their survival. Cox's regression modeling was used to analyze the association of NLR and 6-month mortality after logarithmic transformation.

Results: There were 196 deaths on follow up. Patients in the highest tertile had a dramatically higher risk of death (figure). The log NLR was a significant independent predictor of mortality after multivariate adjustment. (HR 1.33, p=.010).

Kaplan-Meier Curve of Survival by N/L Ratio Tertiles



Conclusion: There exists a significant independent association between admission NLR and mortality in patients with ACS. This relatively inexpensive marker of inflammation can aid in the risk stratification and prognosis of future patients diagnosed with ACS.

1:30 p.m.

1012-149 Discharge Medications and 6 Month Outcomes in Acute Coronary Syndrome (ACS) Patients with Minimal versus Moderate to Severe Coronary Artery Disease (CAD)

David Armstrong, Sahand Rahnama-Mohagdam, James Froehlich, Fadi Saab, Apurva Motivala, Susie Hiniker, Tessa Dake, Kelly Gordon, Kim A. Eagle, University of Michigan Medical Center, Ann Arbor, MI

Background: Evidence-based medicine (EBM) use and outcomes in symptomatic acute coronary syndrome (ACS) patients with minimal obstructive disease on cardiac catheterization (Cath) are poorly understood. We compared the discharge use of four EBMs (ASA, ACE inhibitor Beta Blockers, Statins) and outcomes in ACS patients stratified by severity of coronary artery disease (CAD).

Methods: We identified 3279 consecutive patients with a discharge diagnosis of ACS. We included 2,358 that had undergone Cath; 1,490 of which had 6 to 12 month follow-up (f/u) data. We divided these 1,490 patients into two groups: Group A included 109 patients (7.3%) with minimal CAD (<50% blockage in any vessel), and Group B included 1,381 patients (92.7%) with moderate to severe CAD (≥50% blockage in ≥1 vessel). Data were collected on demographics, medications at discharge, and self-reported adverse outcomes at 6 to 12 months. We compared adverse outcomes at f/u (MI, stroke, unscheduled rehospitalization for cardiac causes, death) between patients with minimal (Group A) and moderate to severe (Group B) CAD.

Results: There were more women in group A (49.54%) vs Group B (31.72%) (p = 0.0001). Patients in group B were more likely to receive ASA (95.08 vs. 88.99, p = 0.007), beta blockers (89.5 vs. 70.64, p < 0.0001), and statins (81.97 vs. 66.06, p < 0.0001) on discharge. F/U rates of death and stroke were similar between both groups. F/U MI and rehospitalization rates were greater for the moderate to severe group (p = 0.015 and p = 0.007, respectively). However, odds ratio revealed that regardless of disease severity, discharge on less than 3 EBMs created a 3.5X greater chance of death at f/u (OR: 3.52, CI 1.57, 7.88, p=0.002). Fewer Group A patients, compared with Group B patients, were discharged on at least 3 of 4 EBMs (65% vs 87%, respectively; p<0.0001).

Conclusions: Women with ACS have a larger relative proportion of minimal CAD on Cath. F/U rates of stroke and death were similar between the two groups, but f/u MI and rehospitalization rates were higher for those with moderate to severe CAD. Evidence based medical therapy improved outcomes in all groups and should be emphasized for all ACS patients, even those with minimal CAD.

1:30 p.m.

1012-181 Comparison of Health Status Recovery after Mital Valve Repair and Replacement in Patients with Mitral Regurgitation

Liping Zhao, Paul Kolm, Cheryl Lewis, Grant Anderson, Michael A. Borger, Harlan Krumholz, Michael Borkon, William Weintraub, Christiana Care Health System, Newark, DE

Background: Patients' postoperative health status is an equally critical issue in deciding the type and timing of mitral valve (MV) surgery. Longitudinal data regarding the comparative improvement in health status after MV repair versus MV replacement are limited.

Methods: 267 patients undergoing primary MV surgery (163 repair; 104 replacement) were prospectively followed at baseline, 1, 3 and 12 months. Health related quality of life (HRQOL) was assessed with the SF-36 and the KCCQ. The generalized estimating equations approach was utilized to compare HRQOL at each time point between the 2

treatment arms with adjustment for propensity scores.

Results: NYHA functional class was significantly improved from baseline for both treatment groups, especially in repair group (p<0.01). For SF-36, dramatic improvements were achieved in most domains for both groups at 3 and 12 months. Repair patients showed significant improvements in mental component scale compared to replacement patients at both 3 and 12 months (p<0.01). For KCCQ, patients in repair group were consistently doing better than those undergoing replacement at each follow-up, however, the difference did not reach significance due to the small percentage of heart failure at follow-up (see Table).

Conclusion: Patients undergoing MV repair achieved better post-operative health status compared to MV replacement, and the optimal timing of MV surgery may be earlier in the course of the disease when repair is possible.

| | 1-Month | 3-Month | 12-Month |
|--------------------------|---------|---------|----------|
| SF-36 | | | |
| Physical Component Scale | | | |
| Repair | -2.81 | 5.98 | 9.02 |
| Replacement | -1.53 | 6.28 | 8.14 |
| Mental Component Scale | | | |
| Repair | 0.34 | 4.24 | 5.73 |
| Replacement | -2.18 | -0.60 | -0.19 |
| KCCQ | | | |
| Total Symptom Score | | | |
| Repair | 8.14 | 18.10 | 20.64 |
| Replacement | 7.24 | 15.01 | 16.78 |
| Overall Summary Score | | | |
| Repair | 4.30 | 20.57 | 25.61 |
| Replacement | 1.45 | 17.73 | 21.54 |
| Clinical Summary Score | | | |
| Repair | 4.65 | 16.39 | 19.45 |
| Replacement | 2.63 | 14.19 | 16.52 |

1:30 p.m.

1012-182 Risk Factors for Stroke Complicating Coronary Angioplasty

William E. Lawson, Lisa Wilbert, Joseph Chernilas, Anil Mani, Luis Gruberg, Zoltan Egri, Mary Maliszewski, David Brown, SUNY Stony Brook, Stony Brook, NY

Background: Stroke (CVA) is a rare but feared complication of coronary angioplasty. Despite changes in adjunctive therapy and advances in technique the incidence of stroke has remained relatively constant.

Methods: All angioplasty (PCI) cases between 1998-2005 were reviewed to evaluate the incidence of CVA (hemorrhagic and thrombotic) and identify potential contributing demographic or therapeutic associations. Statistical testing for significance was by chi square with p<0.05.

Results: There were 10,666 angioplasties (69.2% male) performed between 1998-2005 with an overall mortality rate of 0.83%. PCI for acute myocardial infarction was performed in 1,814 patients; 25.1% received a thrombolytic (lytic) and were referred for salvage PCI. There was no difference in the administration of ASA and a thienopyridine which was administered to essentially all patients in the periprocedural period. There were no significant correlations of CVA with the use of heparin, LMWH, bivalirudin. PCI was complicated by 26 CVA (incidence of 0.24%; 23.1% mortality), 9 hemorrhagic and 17 thrombotic. Women had a greater incidence of CVA (0.46 vs 0.14%; p<0.01) and of hemorrhagic CVA (0.21 vs 0.001%; p<0.001). Hemorrhagic CVA was associated with the use of lytics (0.66 vs 0.06%; p<0.001) and lytic + glycoprotein IIb/IIIa inhibitors- GP2B3A (0.79 vs 0.06%; p<0.001) compared to PCI without their use. No significant demographic or therapeutic correlates were noted with thrombotic CVA. Mortality was significantly increased (p<0.001) for both hemorrhagic (50%) and thrombotic (17.6%) CVA and length of stay (LOS) was significantly prolonged in CVA survivors (9.4 days vs 3.9 days). The incidence of CVA did not vary significantly over the 8 year period.

Discussion: CVA is a persistent and often lethal complication of PCI. Hemorrhagic CVA is clearly associated with lytic and lytic+GP2B3A use, and women appear to be at particular risk with this combination.

Conclusions: CVA is a major contributor of PCI related death and markedly prolongs LOS in survivors. Women are at greater risk of CVA, particularly of hemorrhagic CVA and particular attention to anticoagulation is required.

1:30 p.m.

1012-183 Prevalence of and Recovery From Hospital-Acquired Anemia in Patients With Myocardial Infarction

Mikhail Kosiborod, John S. Rumsfeld, Philip G. Jones, Karen Alexander, John A. Spertus, Mid America Heart Institute of Saint Luke's Hospital, Kansas City, MO

Background: Prior studies have suggested that anemia is common, and prognostically important in patients with acute myocardial infarction (AMI). However, whether anemia in this patient group is predominantly a chronic condition or an acute, hospitalization-related event is unknown.

Methods: TRIUMPHANT is an ongoing 16-center study of AMI treatment and outcomes. Data from the first 233 patients with complete admission, discharge and 1-month follow-up hemoglobins were analyzed to describe the patterns of anemia during and following hospitalization for AMI. The World Health Organization definition of anemia (hemoglobin <12 g/dL for women and <13 g/dL for men) was used to classify patients at each time point.

Results: The mean age of the cohort was a 60±12 years, 66% were male and 76% were Caucasian. The mean hemoglobin at admission, discharge and 1-month was 14.1±1.9, 12.4±1.9 and 13.7±1.8 g/dL, respectively. Only 19% of patients were anemic

on admission, while 50% were anemic at the time of hospital discharge. Of the 116 patients who were anemic at discharge, 74 (62%) did not have anemia on admission. Among these 74 patients who developed "new" anemia during hospitalization, 37% were persistently anemic at 1 month follow up.

Conclusions: Half of AMI patients have anemia at discharge. The majority of these patients develop anemia during hospitalization, and many have persistent anemia 1 month later. These findings suggest that in most AMI patients, anemia is hospitalization-related, and potentially preventable. Understanding the determinants of hospital-acquired anemia and its prognosis warrants further investigation.

1:30 p.m.

1012-184 Comparison Of Quality Of Life In Patients With/without Normal Sinus Rhythm After TEE-Guided Cardioversion: Results From The Acute II Study

Liping Zhao, Paul Kolm, Cheryl Lewis, Susan E. Jasper, Daniel Elliott, Allan L. Klein, William S. Weintraub, Christiana Care Health System, Newark, DE

Background: The ACUTE II study compared use of low molecular weight heparin (LMWH, enoxaparin) with unfractionated heparin (UFH) in patients with atrial fibrillation (AF), and showed similar clinical outcomes in the two groups. The present study sought to explore the impact of restoration of normal sinus rhythm (NSR) on patients' quality of life after TEE-guided cardioversion.

Methods: 155 patients who were scheduled for TEE-guided cardioversion were randomized to enoxaparin (n=76) versus UFH (n=79), and followed up for 5 weeks. Quality of life (QOL) was evaluated using Duke Activity Status Index (DASI), Health Utility Index Mark 3 (HUI-3), and RAND 36-Item Health Survey (RAND-36). ANOVA methods was used to compare QOL scores at baseline and 5-week follow-up.

Results: LMWH group had more NSR at 5 weeks (76% vs. 57%, p=0.01). There were no significant differences in the adjusted baseline QOL scores (DASI, HUI-3, and RAND-36) between patients who did or did not restore NSR at 5-week after TEE-guided cardioversion. At 5-week follow-up, HUI-3 score and physical component scale (PCS) were significant higher in patients with NSR compared with those without NSR (P=0.04). There was a tendency for patients with NSR to have higher DASI score and mental component scale (MCS) than those without NSR (p=0.09) (see Table).

Conclusion: TEE-guided enoxaparin strategy was more effective in helping patients restore NSR. Patients with NSR had better QOL compared with those who did not restore NSR after cardioversion.

| | No NSR (n=41) | NSR (n=77) | p-value |
|---------|---------------|------------|---------|
| DASI | 19.3±3.7 | 23.4±3.7 | 0.09 |
| HUI-3 | 0.64±0.05 | 0.71±0.06 | 0.04 |
| RAND-36 | | | |
| PCS | 34.9±2.6 | 38.3±2.7 | 0.04 |
| MCS | 50.8±2.9 | 53.3±2.9 | 0.09 |

1:30 p.m.

1012-185 Prevalence, Treatment and Control of Hypertension and/or Dyslipidemia Among Hispanic Adults in US Communities

Simon S. Tang, EunMee Lee, Sean D. Candrilli, Heather J. Laird, Stewart S. Levy, Stanley Bassin, Nathan D. Wong, Pfizer, Inc., RTI Health Solutions, New York, NY, Heart Disease Prevention Program, UC Irvine, Irvine, CA

Background: Hispanics represent a substantial growing segment of the US population and are the largest minority group; however, little data exist on the extent of hypertension (HTN) and dyslipidemia (DYS) in this group. We examined the prevalence of HTN, DYS and concomitant HTN and DYS among a large screened population free of diabetes and coronary heart disease.

Methods: 4,700 participants without diabetes and coronary heart disease (mean age 46.7 years; 62.0% female) enrolled in Hispanic Community Outreach programs in Miami (n = 301), New York (n = 188), Los Angeles (n = 3,633) and Houston (n = 578) received measures of total cholesterol (TC), blood pressure (BP) and review of their self-reported medical history, including use of antihypertensive and lipid-lowering medications.

Results: The prevalence of HTN and/or DYS, their treatment rates and the respective control rates of those treated are shown in the table below:

| | Prevalence | Treatment among prevalent cases | Control among the treated |
|--|------------|---------------------------------|---------------------------|
| HTN (BP ≥140/90 mmHg or on medication) | 32.7% | 37.1% | 43.5% |
| DYS (TC ≥240 mg/dL or on medication) | 22.2% | 40.8% | 79.8%* / 48.7%** |
| Both HTN and DYS | 11.2% | 36.1% | 31.1%* / 21.1%** |

Control definitions: For HTN, BP <140/90 mmHg; for DYS, TC <240 mg/dL* or TC<200mg/dL**; For both HTN and DYS, BP <140/90 mmHg and TC <240 mg/dL* or BP <140/90 mmHg and TC<200mg/dL**

Furthermore, the prevalence of pre-hypertension (BP 120-139/80-89 mmHg and not

treated) was 38.4%, while the prevalence of borderline high cholesterol (TC 200-239 mg/dL and not treated) was 26.5%.

Conclusion: Our results demonstrate a substantial prevalence of HTN and DYS among healthy US Hispanic adults. The control rate of DYS with therapy appears to be better than that of HTN with therapy, and the control rate of both HTN and DYS is low. Intensified efforts to identify and treat those Hispanics with these conditions are especially needed.

1:30 p.m.

1012-186 Percutaneous Coronary Intervention: It is Safe for Women as Long as They Receive the Right Medications

Heidi T. May, Jeffrey L. Anderson, Tami L. Bair, Brianna S. Ronnow, Brian S. McClure, Joseph B. Muhlestein, LDS Hospital, Salt Lake City, UT, University of Utah, Salt Lake City, UT

Background: Several observational studies have reported that women have worse outcomes with percutaneous coronary intervention (PCI) than men. It is proposed this might be due to women being less likely to be discharged on appropriate secondary prevention medications (ASA, statins, ACEI, BB). We assessed outcomes after PCI by sex in a large cohort of patients (pts) undergoing PCI.

Methods: Consecutive pts (N=7,896) who underwent PCI and had longterm (mean 5 y) follow-up were included. Logistic and Cox regression models adjusting for standard risk factors and medications prescribed were developed to determine differences in death (D), incident myocardial infarction (MI), target lesion revascularization (TLR), or any of these coronary events (MACE) by sex among men (n=5754) and women (n=2142).

Results: Women had greater baseline risk: older (68 vs 62 years) and more frequently had hypertension (68% vs 56%), diabetes (25% vs 18%), and heart failure (14% vs 8%) (all: p<0.001) but less often smokers (16% vs 25%, p<0.001). They were just as likely to be on secondary prevention medications upon discharge for (men vs women) ASA: 79.6%, 78.7%; statins: 58.3%, 58.7%; and ACEI: 38.1%, 38.1%; and even more likely for BB: 73.7%, 77.5% (<0.0001). Adjusted outcomes for women, compared to men, were: At 30 days: MACE: OR=0.96, p=0.77; D: OR=0.98, p=0.93; MI OR=0.91, p=0.24; TLR: OR=1.04 p=0.86. At 6 months: MACE: OR=1.19, p=0.02; D: OR=1.2, p=0.18; MI: OR=1.3, p=0.01; TLR: 1.2, p=0.16. At 5 years, MACE: OR=0.91, p=0.18; D: OR=1.07, p=0.38; MI: OR=1.08, p=0.35. The effect of being discharged on appropriate medications (at least 3 of the 4 medication classes) provided a similar 5 year benefit (women compared to men: MACE: OR=1.07, p=0.59; D: OR=0.19, p=0.47; MI: OR=1.39, p=0.30).

Conclusion: In a large, consecutive, series of patients treated with PCI, risks were similar at 30 days and 5 years for women and men. Women were found to be just as likely to receive appropriate secondary prevention medications at discharge and received just as much clinical benefit as men. Thus, women can undergo PCI in the current technology era with similar safety as men as long as they are given appropriate secondary prevention medications after.

1:30 p.m.

1012-187 Refractory End-Stage Chronic Heart Failure Day Care Service: A Five-Year Single Center Experience

Dov Freimark, Michael Arad, Shlomi Matetzky, Liron Gershovitz, Isabel Langerman, Nira Koren Morag, Naomi Hochberg, Yafit Makmal, Michael Shechter, The Heart Institute, Sheba Medical Center, Tel Hashomer, Israel

Background: Chronic heart failure (CHF) is a common problem associated with frequent admissions to hospital and a poor prognosis.

Methods: To summarize a single center 5-year experience we retrospectively analysed all patients admitted to our CHF day care service between September 2000 and September 2005.

Results: One-hundred and ninety refractory end-stage (Stage D, NYHA IV) CHF patients (86% males) were treated in the day care clinic for 6 hour visits, twice a week, mean age 65±12 years (range 28-82), mean left ventricular ejection fraction 25±11% and mean body mass index 27.4±4.9 kg/m². Seventy-seven percent had ischemic and 23% non-ischemic cardiomyopathy. Of the 41(22%) heart transplantation candidates only 20 patients underwent transplant. In addition to their previous chronic concomitant oral medications, 91% patients received combinations of intravenous diuretics, 87% intermittent low-dose dobutamine (≤ 5 µg/kg/min), 38% low dose dopamine (≤ 3 µg/kg/min), 47% intravenous iron preparation and/or blood, 36% intravenous nitroprusside. Pleural/peritoneal fluid extraction, nitric oxide inhalation or continuous positive airway pressure (C-PAP) were done/used as needed. In 158/190 (83%) patients with follow-up of ≥ 1 year from initiation of therapy, 46 (29.3%) died: 23% CHF exacerbation, 5.7% infectious, 4.4% sudden cardiac death, 3.8% malignancies, 2.5% malignant arrhythmias, 1.9% renal failure, 1.3% CVA and 0.6% myocardial infarction. In a person/year analysis there were only 0.68 rehospitalizations/patient/year. The most frequent reason for rehospitalization was CHF exacerbation (16.5%).

Conclusion: A day care service intensively supports severe, end-stage CHF patients. A multi-drug therapy and intensive care monitoring of electrolytes, hemoglobin, and cardiac rhythm in addition to education and psychological support facilitate patients' active daily living and may contribute to the relatively lower-than expected rate of mortality and hospitalizations. A CHF day care service is relatively safe but further prospective studies are needed to evaluate the impact of various treatment strategies on survival, hospitalizations and quality of life of these patients.

1012-188

Short- and long-term Health Related Quality of Life and Anginal Status after Randomization to Coronary Stenting versus Bypass Surgery for the treatment of Multivessel Disease: Results of the ARTS-1 Study

Ron T. van Domburg, Andrew T. Ong, Susanne Pedersen, M. Bressers, Brian G. Firth, Felix Unger, Patrick W. Serruys, Erasmus Medical Center, Rotterdam, The Netherlands

Background: Health related quality of life (HRQL) beyond one year of treatment of multivessel coronary artery disease with stenting or coronary artery bypass grafting (CABG) is yet unknown. The Arterial Revascularization Therapy Study (ARTS) was designed to compare CABG and stenting in multivessel disease.

Methods and Results: HRQL was evaluated at baseline, at 1- month and at 6-, 12- and 36 months after revascularization using the Short Form Health Survey (SF-36) in patients randomized to stenting (n=483) versus CABG (n=492). Both stenting and CABG resulted in significant improvement of HRQL and anginal status. Although there was a trend for better HRQL after CABG, the disparity between the two procedures decreased long-term. Most of the difference between the two procedures was attributed to repeat interventions in the stent group; at 3 years, 19% of stent patients versus 13% of CABG patients (p<0.0001) had undergone a repeat intervention. On most of the SF-36 scores, there was no difference between diabetics and non-diabetics, with diabetic patients having a worse score only on general health and physical functioning at all time points (p<0.0001).

Conclusions: Both stenting and CABG resulted in a significant improvement in HRQL and angina. There was a trend for better HRQL after CABG, but this difference was mainly attributed to repeat revascularization in the stent group. Therefore, using HRQL outcomes as part of the clinical decision making, there seems no need to prefer CABG above stenting in order to relief pain on the long-term.

1:30 p.m.

1012-189

Artificial Neural Networks Are A Potential Tool For Estimating Prognosis In Coronary Artery Disease - Are Standard Algorithms Sufficient?

Jaroslav D. Kasprzak, Anna Michalak, Andrzej Nowakowski, Jaroslaw Drozd, Maria Krzeminska-Pakula, II Chair of Cardiology, Medical University of Lodz, Lodz, Poland

Aim: Artificial neural networks (ANN) may be used for creation of expert systems in cardiology. We aimed to create and test the ability of ANN for the prediction of individual risk in patients with coronary disease.

Methods: We based our study on the database of 250 patients with coronary disease with known follow-up of 18±6 months duration. Every patient was represented with one input vector, containing data on age, sex, BMI, CSS, history of infarction, diabetes, dyslipidemia, smoking and hypertension and output vector was expressed as 4 grades of clinical course: death / infarction or revascularizations / other acute coronary syndromes / uneventful course. Tested ANNs were prepared using different methods: 1. Backpropagation algorithm - networks with one or two hidden layers included 3-40 neurons, with tanh activation function; 2.Radial Basis Function Network (RBFN) with 20-30 neurons in hidden layers; 3. Cascade Correlation of Fahlman (CCF) with 50,60 and 100 maximal neuron in hidden layer, tanh or Gauss activation function; 4. Kohonen Algorithm (40 neurons).

Results: Tested ANNs differed in their ability to predict the clinical course: 50-75% correct answers for Backpropagation algorithm, 40-75% for RBFN, 50% for CCF and 75% for Kohonen ANN. The most promising approach was using linked Kohonen learning algorithm with Backpropagation algorithm (different networks had 1 or 2 hidden layers with 20-70 neurons), providing 85% correct answers when 1 hidden layer with 40 neurons, 0.6 learning rate and 500 learning cycles in Kohonen algorithm, 0.1 learning rate and 500 cycles in Backpropagation algorithm was used. We expected that neurons would specialize in recognizing certain samples in the same disease categories, but this was not observed. Increasing learning cycles numbers gave the effect of overfitting.

Conclusions: ANNs are potential means for creation of advanced prognostic tools in cardiovascular disease. Standard ANN algorithms may not be optimal for clinical expert systems, however, with a proper combination of network structure and learning algorithms, it is possible to obtain >80% correct prediction of clinical course. Our results warrant validation using larger test cohorts.

1:30 p.m.

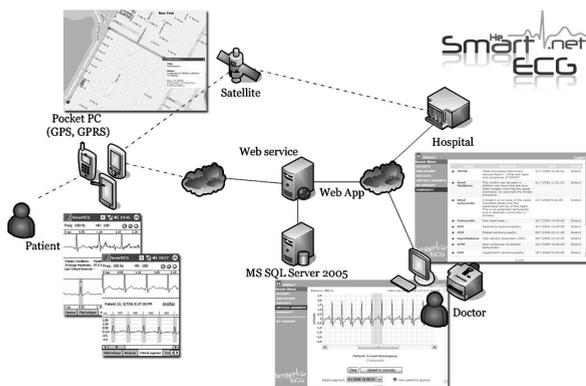
1012-190

Smart Ecg: Solution For Mobile Heart Work Analysis And Medical Interventions In Case Of Heart Work Problems

Marko Velic, Miroslav Novak, Marko Oreskovic, Ivan Padavic, Hrvoje Pedjlo, Zlatko Stacic, Neven Vrcek, Sinisa Car, Faculty of Organisation and Informatics, University of Zagreb, Varazdin, Croatia, General Hospital, Varazdin, Croatia

Background: Chronic ischemic heart disease is the most common cause of death in industrialized countries and is usually associated with fatal sustained ventricular tachycardia. Early recognition and emergency procedure is a key for surviving of these patients.

Goals: In this paper we discuss abilities and advantages of new information and communication technologies (ICT) in continuous heart work monitoring and analysis. Goals of "Smart ECG" system are: to enable medical intervention in case of heart conditions just on time and integration of ICTs in a way they have not been integrated before.



Methods: Smart ECG is information system which integrates many different ICT solutions. Smart ECG includes six main components: portable bluetooth ECG device, Pocket PC application, Web service, central database, Web application and GPS integrated support. ECG recorded data is transmitted via wireless bluetooth connection to a PDA application for display and analysis of QRS. If irregularities are detected, data is sent in main database via GPRS and doctor is alarmed via SMS. Afterwards, doctor can log onto his Web application where he can monitor patient's condition and see what happens. There is also built in GPS support, so that patient can be located on the map which allows medical intervention just on time. Web forum allows exchange of data and doctors' opinions.

Conclusions: Smart ECG integrates many ICTs and enables heart work monitoring in different situations, emergency reaction and GPS location of patient.

1:30 p.m.

1012-191

A Comparative Study on the Feasibility and Safety of Translunar Artery Versus Transradial Artery Access for PCI in Patients With Coronary Heart Disease

Xianghua Fu, Xinshun Gu, Weize Fan, Yunfa Jiang, Guozhen Hao, Weili Wu, Shiqiang Li, Xiaokun Liu, Ning Ma, 2nd Hospital of Hebei Medical University, Shijiazhuang, People's Republic of China

Background: The diameter in ulnar artery is similar to that in radial artery, but the ulnar artery approach as alternative of forearm access for PCI has still been a few application. Since 2001 we early started TUA (translunar artery) access for PCI in the world, we have been continually performing PCI via TUA approach for 160 patients whose ulnar artery were suitable for PCI. This study was to compare the feasibility and safety of TUA-PCI vs. TRA-PCI (transradial artery PCI).

Methods: Total of 320 CHD patients (38 to 80 years old) were divided into TRA-PCI group (male 131, female 29) and TUA-PCI group (male 133, female 27) whose ulnar artery pulsation is clear and strong. The time of manipulative duration for each protocol of PCI was recorded. The time of Allen's test, lumen diameter (mm), cross area of vessel lumen (mm²), blood velocity (Vs max) and blood flow resistance index (RI) in ulnar and radial artery were measured, respectively, as well were compared quantitatively before and 6 months after PCI procedure.

Results: The puncture success rate of TUA-PCI group was 95.7% equal to that of TRA-PCI group, and among them the first puncture success rate was 83.6% in TUA-PCI group and 84.2% in TRA-PCI group. All of 212 lesion segments in 178 vessels were angioplasticated and 215 stents were implanted in TUA-PCI group by 6F guiding catheter, while 210 lesion segments in 177 vessels were angioplasticated and 214 stents were implanted in PCI-TRA group, successfully. The average time of guiding catheters engaging in ostium of target vessels, the average time of under X ray fluoroscopy and the total time of whole procedure were no significant difference between two groups, respectively (4.25±0.56 vs. 4.22±0.49min, 23.8±0.46 vs. 22.9±0.57min, 54.6±12.4 vs. 52.8±14.2min; all *p*>0.05). No significant changes in above vessel investigated results and no serious complications such as occlusion of ulnar artery and ulnar nerve injury were found follow-up 6 months after PCI procedure.

Conclusions: The feasibility and safety via TUA-PCI in CHD patients whose ulnar artery is suitable to as an approach for PCI are same as those via TRA-PCI, and ulnar artery might be as an alternative choice for PCI via the forearm access.

1:30 p.m.

1012-192

A Unique Animal Model of Aortic Valve Calcification Using High Adenine Diet

Mony Shuvy, Suzan Abedat, Ronen Beeri, Haim D. Danenberg, David Planer, Chaim Lotan, Heart Institute, Hadassah-Hebrew University Medical Center, Jerusalem, Israel

Background: Aortic valve calcification (AVC) is a central component in the pathophysiology of aortic stenosis. It involves accumulation of inflammatory cells, osteoblast transformation and bone formation. Parathyroid hormone (PTH) is essential for osteoblast activity, tissue calcification and bone formation. Since a diet containing high levels of Adenine and Phosphate has been shown to induce polyuric renal failure and secondary hyperparathyroidism, our aim was to assess whether this diet induces AVC.

Methods: 15 rats were fed daily with the Adenine diet (diet group) for 7 weeks and with

normal bovine serum albumin (BSA) for 2 additional weeks.

10 control rats received BSA alone. Renal function tests, electrolytes and PTH levels were assessed After 4 and 9 weeks. Echocardiography and multislice computed tomography (MSCT) were performed at 9 weeks. Valve tissue was stained for calcium (Von Kossa), macrophages (CD68), and Osteopontin (an osteoblast marker). Osteopontin and activated P38-MAPK levels were assessed using Western blot.

Results: After 4 weeks, all diet group rats developed renal failure and secondary hyperparathyroidism compared to the controls (PTH 2330 ± 280 pg/mL Versus 281 ± 168 pg/mL, respectively, *p*<0.01). At 9 weeks (2 weeks After cessation of the Adenine diet) renal failure completely resolved, with improvement of the hyperparathyroid state (PTH 750 ± 477 pg/mL *p*<0.01). Echocardiography demonstrated valve calcification in all diet group valves, but in none of the controls. Calcium score by MSCT was significantly higher in the diet group (145 ± 118 Versus 0; *p*<0.01). Histological examination showed calcium deposits in all parts of the valve, and stains for Osteopontin and CD68 were positive only in diet group valves. Both Osteopontin and activated P38-MAPK levels were significantly elevated in the diet group as compared to the controls.

Conclusion: We developed a simple diet-induced animal model for AVC quantifiable by MSCT and echocardiography. The calcification process involves activation of typical signaling pathways, macrophage accumulation and osteoblast transformation. This model may serve as an important tool in the study of aortic valve disease.

1:30 p.m.

1012-193

Elective Percutaneous Coronary Intervention Without On-Site Surgical Backup: A Community Hospital Experience

Mohamed Djelmami-Hani, Moutatou Mouanoutou, Abdelazim Hashim, Joaquin Solis, Lawrence Bergen, Neil Oldridge, Leo C. Egbujobi, Masood Akhtar, Suhail Allaqaband, Tanvir Bajwa, Aurora Sinai/St. Luke's Medical Ctrs. Univ. of Wisconsin School of Medicine and Public Health-MCC, Milwaukee, WI, Beloit Memorial Hospital, Beloit, WI

Background: Current American College of Cardiology (ACC) guidelines support primary percutaneous coronary intervention (PCI) without on-site surgical backup (OSB) only in acute ST segment elevation myocardial infarction (STEMI) (Class IIb) While elective PCI without OSB is considered a class III indication.

Methods: We analyzed initial elective PCI experience without OSB at our satellite institution. A predefined protocol was designed to transfer patients to a cardiac surgical facility if necessary. An experienced interventional cardiologist reviewed the diagnostic angiograms. Patients with technically complex lesions were excluded from the study. The primary endpoints were any procedure-related death or complications requiring an emergency coronary artery bypass graft (ECABG) and 6-month outcome was analyzed.

Results: From January 2003 to April 2006, a total of 321 elective PCI's were performed. The mean age was 64±12, 68% of the patients were male. The prevalence of diabetes, hypertension and peripheral arterial disease was 28%, 82.5% and 2% respectively. A total of 352 vessels were stented. Multi-vessel PCI was performed in 61 patients (19%). Lesion morphology was Type A in 252 (66%), Type B in 99 (26%), Type B2 in 11 (2.9%) and type C in 20 (5.1%). A total of 437 stents were deployed; 35 (8%) bare metal, 149 (34%) sirolimus-eluting and 253 (58%) paclitaxel-eluting. IIb-IIIa inhibitors were used in 77 (24%) cases. Procedural success was 99.7%. One patient had a heavily calcified lesion that could not be dilated with balloon and was electively transferred to a facility with OSB for PCI. Three patients had hematoma without need for blood transfusion. There were no deaths, myocardial infarctions or need for ECABG.

Conclusion: Our experience suggests that elective PCI, in carefully selected patients with non-complex lesions, can be performed safely without OSB. In contrast to the current ACC guidelines, we propose that non-complex lesions can be recommended for PCI by an experienced interventional cardiologist in facilities without OSB but with a predefined protocol to transfer patients to a surgical site in case of emergency.

1:30 p.m.

1012-194

The Cardiovascular Disease Prevention Model: a Model That Predicts Future Incidences of Cardiovascular Disease in Any Given Population and Undertakes Cost-Effectiveness Analyses of Primary Preventive Interventions

Danny Liew, Dianna Magliano, Kate Webb, Mendel Grobler, NHMRC Centre for Clinical Research in Therapeutics, DEPM, Monash University, Melbourne, Australia, Pfizer Australia, Sydney, Australia

Background: The cardiovascular (CVD) Prevention Model (CPM) was developed to predict the future incidence of CVD (comprising coronary heart disease and stroke) in any given population and to undertake cost-effectiveness analyses of primary preventive strategies for CVD in that population.

Methods: The CPM is a Markov model comprising four initial health states: 'Alive without CVD', 'Alive with CVD', 'Dead after CVD' and 'Dead from other causes'. Subjects transition through the states based on the risks of CVD derived from Framingham and UKPDS risk equations for non-diabetic and diabetic individuals, respectively. The risks of death after incident CVD are drawn from MONICA registry data. Life-course analysis is applied to account for changes to risks with age. To illustrate the function of the CPM, it was populated with cross-sectional data from the 2000-2001 Australian Diabetes, Obesity and Lifestyle study. The population (n=1105) comprised men and women initially aged 35-73 years and without CVD, simulated to follow until death or 74 years. The cost-effectiveness of atorvastatin for primary prevention was modelled via a decision analysis, using efficacy data from a recent meta-analysis of randomised trials and Australian cost and utility data. The perspective was that of the health sector in 2005. An annual discount rate of 5% was applied to future costs and health gains and discontinuation of atorvastatin was assumed to be 40% in the first year.

Results: With 'No treatment' the incidence of CVD until 74 years (per 1,000 person

years) was 15.20 compared to 12.17 for 'atorvastatin' treatment, relative risk (RR) of 0.80. The incremental cost effectiveness ratio per year of life saved was AUD\$46,200. The incremental cost effectiveness ratio per quality adjusted life year was AUD\$35,200. **Conclusions:** The CPM allows for the prediction of future incidences of CVD in any population where representative cross-sectional data on cardiovascular risk factors are available. With the availability of cost data, cost-effectiveness analyses of primary preventive interventions can also be undertaken. Atorvastatin represents a cost-effective means of preventing first-onset CVD among Australian adults.

ACC.POSTER SESSION

1018

Special Topics

Monday, March 26, 2007, 9:00 a.m.-12:30 p.m.
Hall H

9:00 a.m.

1018-146

Do the Results of the Arterial Revascularization Therapies Study Trial Generalize to Current Revascularization Practices in Northern New England

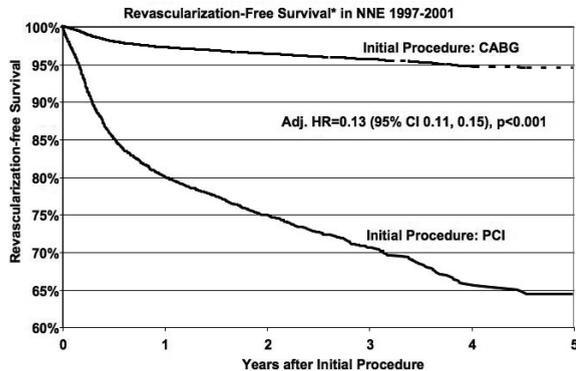
David J. Malenka, Craig W. Langner, John F. Robb, Lawrence J. Dacey, Mirle A. Kellett, Jr., Reed D. Quinn, Theodore M. Silver, Bruce J. Leavitt, Michael J. Hearne, Winthrop D. Piper, Elaine M. Olmstead, Gerald T. O'Connor, The Northern New England Cardiovascular Disease Study Group, Lebanon, NH, Dartmouth-Hitchcock Medical Center, Lebanon, NH

Background: ARTS, which compared multi-vessel stenting to CABG, reported 5-year revascularization rates of 8.8% for CABG and 30.3% for PCI with stenting. The generalizability of these results to a more diverse group of patients treated outside a randomized trial has not been determined.

Methods: Linking the Northern New England PCI and CABG registries with NDI survival data, we identified all patients with 2- or 3-vessel CAD who might have been candidates for either procedure (no prior revascularization, age < 80, LM24 hours from MI, non-emergent) from 1997-2001 (PCI-3,038; CABG-7,759). Adjusted, revascularization-free survival rates are reported and compared.

9:00 a.m.

Special Topics



* Adjusted for: sex, age, # of diseased vessels, priority, DM, CHF, PVD, RF, COPD, prior MI, EF

Results: CABG patients were older, had more co-morbidities, lower EFs, and more 3-vessel disease. Stents were used in 88% of PCIs, IMAs in 95% of CABGs, and 40% of PCI patients were completely revascularized. The 5-year adjusted risk of repeat revascularization (Figure) was 36% for PCI and 6% for CABG (HR 0.13, p<0.001) with a disproportionate early risk for PCI of 20% during year 1, decreasing to 5% per annum over years 2-5.

Conclusions: Despite a more diverse patient population and less complete initial revascularization with PCI, the 5 year risks of repeat revascularization for CABG and PCI in Northern New England are comparable to those reported in ARTS. This suggests that trials comparing newer revascularization strategies, such as drug-eluting stents, may be generalizable to broader patient populations.

9:00 a.m.

1018-147

Impact of Coordinated Process of Care on Individual Components of Treatment Delays Among ST Elevation Myocardial Infarction Patients Treated with Primary Percutaneous Coronary Intervention

Joji J. Varghese, Frank V. Aguirre, Syeda Rumman, Sushma Koneru, David L. Griffen, Jayne Thompson, Karen Baur, Gary Mangold, Jack Gruwell, Conrad Davis, John B. Gill, Wilfred Lam, Michael P. Kelley, Frank L. Mikell, Prairie Cardiovascular Consultants, Ltd., Springfield, IL, Southern Illinois University School of Medicine, Springfield, IL

Background: Despite current ST elevation myocardial infarction (STEMI) guideline

recommendations, door-balloon times among patients receiving primary percutaneous coronary intervention (PPCI) remains excessive. Overcoming intra-hospital barriers which limit identification, triage and PPCI performance remains a major goal of expeditious performance of PPCI.

Methods: In this single center community hospital study, we examined the impact of a 6-year continuous institutional policy review and protocol modification process on 3 time intervals reflective of overall STEMI process of care. Time intervals evaluated were: a. MI identification (door-ECG), b. Emergency department treatment (ED) and triage (door-cath lab arrival) and PPCI-related care (cath lab arrival-balloon).

Results:

Year (Median, 25th, 75th Percentile)

| Year | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | P value |
|---------------------------|--------------|--------------|--------------|-------------|--------------|-------------|---------|
| Variable | (n=66) | (n=46) | (n=53) | (n=57) | (n=78) | (n=36) | |
| Symptom Onset-Door (min.) | 100 (57,189) | 107 (53,415) | 107 (60,347) | 99 (62,199) | 109 (59,190) | 91 (67,360) | NS |
| Door-ECG(min.) | 13 (5,19) | 9 (5,19) | 7 (3,12) | 5 (2,9) | 3 (1,9) | 4 (1,6) | <0.0001 |
| Door-Cath Lab (min.) | 72 (56,96) | 53 (40,102) | 49 (33,68) | 50 (36,66) | 43 (26,63) | 41 (27,47) | <0.0001 |
| Cath Lab-Balloon (min.) | 24 (15,34) | 30 (23,40) | 27 (23,38) | 32 (23,41) | 29 (22,36) | 25 (19,39) | NS |
| Door-Balloon (min.) | 99 (78,129) | 83 (69,161) | 78 (61,100) | 80 (67,101) | 71 (56,96) | 73 (50,88) | <0.0001 |
| Door-Balloon ≤90 min.(%) | 46 | 59 | 68 | 67 | 71 | 83 | 0.003 |
| Door-Balloon ≤120 min.(%) | 70 | 74 | 81 | 84 | 83 | 97 | 0.02 |

Conclusions: Over a 6-yr time span, continuous institutional monitoring and PPCI protocol refinement resulted in a 37% reduction in overall door-balloon time and achievement of a door to balloon time ≤90 mins. in approximately 80% of patients. This time reduction was largely attributable to a 73% reduction in STEMI identification and a 43% reduction in ED treatment and triage, without significant change of PPCI-related times.

9:00 a.m.

1018-148

Increased Use of Cardiovascular Drugs Explains Recent Trends in Prognosis after Myocardial Infarction

Soko Setoguchi, Raisa Levin, Wolfgang C. Winkelmayr, Brigham and Women's Hospital, Boston, MA

Background: The uses of statins, beta-blockers (BB), and angiotensin converting enzyme-inhibitors (ACEI) or angiotensin-II-receptor blockers (ARB) after myocardial infarction (MI) have been increasing over the past decade. Little is known, however, about the recent trends in long-term prognosis after MI, and whether increasing use of cardiovascular medications contributed to improvement of survival after MI.

Methods: We identified 21,848 patients hospitalized for MI who survived ≥= 30 days after discharge using data from Medicare and pharmacy assistance programs in two states (1995-2004). We assessed age, gender, race, comorbidities, length of stay and use of coronary interventions during the MI hospitalization as well as filled prescriptions for any statin, BB, ACEI/ARB or antiplatelet agents within 30 days after discharge. We followed all patients from the index date (30 days after discharge) until they died, or the end of eligibility/study period. Multivariate Cox regression was used to study trends in long-term mortality. To assess the contribution of the use of the recommended drugs and coronary interventions after MI, we sequentially introduced these variables into the fully-adjusted models and evaluated the change in adjusted hazard ratios (aHR) for calendar year.

Results: Of 21,484 patients identified, we observed 12,142 deaths during 74,982 person-years of follow-up. After adjusting for demographics and comorbidities, the mortality after MI decreased significantly from 1995 to 2004 (aHR for trend=0.97; 95% CI 0.97-0.98), corresponding to a 3% reduction in mortality each year. After introducing variables for statin, BB, ACEI/ARB or antiplatelet drug use, calendar year was no longer associated with mortality (aHR for trend=1.00; 95% CI 0.99-1.01), indicating that the observed improvement in mortality after MI was explained by increasing use of these drugs. We also observed a smaller attenuation of the effect of calendar year after adjusting for MI-related procedures.

Conclusions: Long-term prognosis in elderly patients with MI has improved considerably over time, which appeared to be fully attributable to increasing use of cardiovascular medications after MI.

9:00 a.m.

1018-149

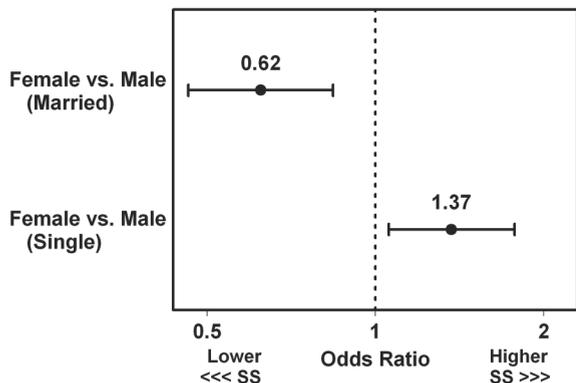
Interaction Between Social Support, Marital Status and Gender After Acute Myocardial Infarction

Rasha N. Bazari, Sanjaya Khanal, Homaa Ahmad, Kimberly Reid, Judith Lichtman, Viola Vaccarino, Donna Buchanan, John A. Spertus, Henry Ford Health System, Detroit, MI, Mid America Heart Institute, Kansas city, MO

Background: Lower social support is known to be associated with worse outcomes after myocardial infarction (MI). Since men and women have different marital roles, we examined the gender-related association of marital status with social support after MI.

Methods: Among 2426 AMI patients in the 19-center PREMIER study, we quantified the interaction between gender, marital status and social support using the ENRICH Social Support Inventory (ESSI, range=1-32) at baseline, 1, 6 and 12 months after discharge. ESSI scores were categorized into the lowest (≤27) vs. the highest 3 quartiles. Covariates in the multivariable repeated measures logistic regression analysis included

demographics, clinical data, MI type, depression and use of coronary revascularization.
Results: Overall, 68.8% of men and 43.5% of women were married. At baseline, low social support was present in 19.5% of married females, 38.6% of unmarried females, 12.1% of married males, and 49% of unmarried males, $p < 0.001$. Multivariable adjustment revealed a significant interaction between marriage and gender ($p < 0.001$), with females having higher social support than men among unmarried patients, odds ratio (OR) 1.37, (95% confidence interval [CI], 1.06-1.77) and, conversely, higher social support for married men than married women, OR 0.62, (95% CI, 0.46-0.84; Figure).

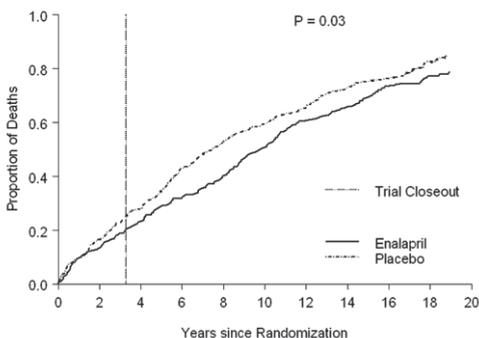


Conclusion: Efforts to improve the social support of married women and single individuals warrant further investigation.
 Abbreviations: SS, Social support.

1018-181 Long-Term Mortality Benefits From Early Enalapril Therapy in Patients With Left Ventricular Systolic Dysfunction : A 20-Year Follow-Up of SOLVD

Sylvie A. Ahn, Philip Jong*, Michel F. Rousseau, University of Louvain, Brussels, Belgium, University of Toronto*, Toronto, ON, Canada

Background: In an extended follow-up of the Studies of Left Ventricular Dysfunction (SOLVD), we showed that enalapril had a sustained mortality benefit at 12 years. We reported here a 20-year follow-up of SOLVD to determine the effect of early in-trial treatment with enalapril on long-term survival post trial.
Methods: Among the 558 Belgium patients from SOLVD randomized to either enalapril or placebo, post-trial mortality data were collected on all 433 survivors (218 enalapril vs. 215 placebo) at closeout. All patients were placed on enalapril after the trial. Long-term survival was compared between patients who received early enalapril therapy and those who received delayed therapy.



Results: No patient was lost to follow-up. The median duration of follow-up was 18.1 (range 16.1-20.0) years. All-cause mortality was significantly reduced among patients treated early with enalapril as compared with placebo (77 vs. 82 %, $p=0.03$). This reduction was attributed to a decrease in cardiac deaths. Early therapy with enalapril had an added mortality benefit in the post trial period beyond that derived in trial (71 vs. 77 %, $p=0.01$). Life expectancy was significantly increased by 28.3 months among patients treated early with enalapril over those treated late ($p=0.006$).
Conclusion: In a 20-year follow-up of SOLVD, survival and life expectancy were increased in patients with left ventricular systolic dysfunction who received early therapy with enalapril as compared to those who received delayed therapy.

1018-182 Differences in Complication Rates among Medicare Beneficiaries Undergoing Coronary Artery Bypass Graft Surgery: Do Graft Types and Cardiopulmonary Bypass Matter?

Phillip P. Brown, Aaron D. Kugelmass, April W. Simon, Steve D. Culler, Cardiac Data Solutions, Inc., Atlanta, GA, Emory University Rollins School of Public Health, Atlanta, GA

Background: This research examines gender differences in five adverse events associated with Medicare beneficiaries undergoing CABG surgery by type of graft and use of cardiopulmonary bypass.
Methods: A retrospective analysis was conducted using the Medicare Provider Analysis and Review (MedPar) Files for fiscal year 2004. The study sample consists of all hospitals that performed at least 52 CABG surgeries during a fiscal year. The final sample consisted of 123,436 Medicare beneficiaries who underwent CABG surgery without concomitant valve surgery. Separate logistic regression equations (controlling for 25 demographic characteristics and co-morbidities) were estimated to predict each Medicare beneficiary's probability of experiencing in-hospital death, new onset hemodialysis, post-operative stroke, infection and adult respiratory distress syndrome. Average risk-adjusted rates for each adverse event were calculated separately by gender, type of graft and use of cardiopulmonary bypass.
Results: Overall, 66.9% of the Medicare beneficiaries were men, 70.4% of the surgeries used a pump and 82.8% of the grafts involved arteries. The table provides the average risk adjusted adverse event rate by gender for each sub-population. Women had significantly higher adverse event rates than men in each category.
Conclusion: For both women and men, risk adjusted adverse event rates were lowest for those patients using arterial grafts on pump and highest for those patient receiving only veins off pump.

| | Men | | | | Women | | | |
|---------------------------|-----------------------------|--------------------|-----------------------------|--------------------|-----------------------------|--------------------|-----------------------------|--------------------|
| | On Pump | | Off Pump | | On Pump | | Off Pump | |
| | At Least One Arterial Graft | Vein Grafts (only) | At Least One Arterial Graft | Vein Grafts (only) | At Least One Arterial Graft | Vein Grafts (only) | At Least One Arterial Graft | Vein Grafts (only) |
| Patients | 50,322 | 8,590 | 19,269 | 4,403 | 22,617 | 5,329 | 10,011 | 2,895 |
| RA Mortality | 2.69% | 4.01% | 3.05% | 4.43% | 4.12% | 5.74% | 4.54% | 6.33% |
| RA New Onset Hemodialysis | 0.84% | 0.97% | 0.90% | 1.00% | 1.10% | 1.11% | 1.09% | 1.15% |
| RA Post Operative Stroke | 1.43% | 1.59% | 1.48% | 1.63% | 1.70% | 1.86% | 1.76% | 1.92% |
| RA Infection | 2.35% | 3.03% | 2.58% | 3.39% | 2.69% | 3.33% | 2.93% | 3.77% |
| RA Post Operative ARDS | 5.35% | 6.64% | 5.76% | 7.18% | 6.40% | 7.70% | 6.89% | 8.43% |

1018-183 National Patterns of Glucose Control Among Patients Hospitalized With Acute Myocardial Infarction

Mikhail Kosiborod, Silvio Inzucchi, Bobby Clark, Harlan M. Krumholz, Philip G. Jones, James O'Keefe, Jr., John A. Spertus, Mid America Heart Institute of Saint Luke's Hospital, Kansas City, MO, Cerner Corporation, Kansas City, MO

Background: Elevated blood glucose (BG) level is a major modifiable risk factor for adverse outcomes among patients hospitalized with acute myocardial infarction (AMI). Insulin therapy remains the treatment of choice for glucose control in this setting. Current national practice patterns regarding in-hospital BG control in AMI patients are not known.
Methods: We conducted a study using Cerner Corporation's Health Facts™, a national database derived from electronic medical records at 39 medical centers that contribute patients' demographic, clinical, comprehensive laboratory and pharmacy data. Hospitals are located in the Northeast (53%), Midwest (23%), South (17%) and West (7%), 24% are teaching, 92% urban, and 23% have >500 beds. We analyzed patterns of BG control and documented insulin therapy among 16,534 patients hospitalized with AMI from January 2000-December 2005.
Results: Of the 4940 patients (30%) with recognized diabetes (DM), nearly half (2412 patients, 49%) had mean BG >200 mg/dL during the first 24 hours after hospital admission. When the entire hospitalization was considered, 34% DM patients had mean BG >200 mg/dL, while 61% had mean BG between 110-200 mg/dL, and only 5% maintained mean BG <110 mg/dL. Among patients without recognized DM, 8% had mean BG >200 mg/dL during the first 24 hours. When entire hospitalization was considered, 4% of patients without known DM had mean BG >200 mg/dL, while 65% had mean BG between 110-200 mg/dL, and 31% had mean glucose <110 mg/dL.
 Among DM patients with mean hospitalization BG of >200 mg/dL, only 138 patients (8%)

Special Topics

received intravenous insulin infusion, while nearly a third (498 patients, 30%) received no insulin therapy at all. Among patients without known DM and mean hospitalization BG >200 mg/dL, only 23 patients (5%) received intravenous insulin infusion, while over a half (264 patients, 58%) received no insulin therapy at all.

Conclusions: In patients hospitalized with AMI, average BG control is poor. Even among patients with marked hyperglycemia, few receive intravenous insulin infusion. Large proportions of hyperglycemic patients do not receive any insulin therapy at all, particularly among those without prior history of diabetes.

9:00 a.m.

1018-184 Importance of Pain and Hypertension in Acute Type B Aortic Dissection: Insights from the International Registry of Acute Aortic Dissection (IRAD)

Santi Trimarchi, Kim A. Eagle, Christoph A. Nienaber, Toru Suzuki, Patrick T. O'Gara, Stuart J. Hutchison, Vincenzo Rampoldi, Eduardo Bossone, Arturo Evangelista, Thomas T. Tsai, James B. Froehlich, Jeanna V. Cooper, Dean E. Smith, Gabriel W. Meinhardt, Thoralf M. Sundt, III, Truls Myrnes, Eric M. Isselbacher, On Behalf of the International Registry of Acute Aortic Dissection (IRAD) Investigators, University of Michigan Medical Center, Ann Arbor, MI

Background: In patients with acute type B aortic dissection (ABAD), presence of recurrent or refractory pain and/or hypertension on medical therapy may be considered as an indication for surgery/intervention. We evaluated this subgroup of patients to assess in-hospital results of medical, endovascular or surgical management of patients enrolled in the International Registry of Acute Aortic Dissection (IRAD).

Methods: There were 365 patients affected by ABAD enrolled in the IRAD from 1996-2004 and categorized according to risk profile into two groups: Intermediate risk group (G I): patients with recurrent or refractory pain and/or hypertension. Patients not presenting clinical complications at presentation were categorized as low risk or uncomplicated (G U). "High risk" patients with any of shock, periaortic hematoma, spinal cord ischemia, preop mesenteric ischemia/infarction, acute renal failure, limb ischemia were excluded in this analysis. In-hospital outcomes and 1-year follow-up were reported.

Results: Overall in-hospital mortality was 6.5%, in G I (69 patients) was 17.4%, compared to 4.0% in G U (296 patients, p<0.01) (Table). Overall survival at 1 year was 84.6% for G I and 90.7% for G U (log rank p=0.46).

Conclusions: In ABAD uncomplicated patients, medical therapy is associated with excellent in-hospital mortality outcomes whereas patients with continuing pain/hypertension had poorer outcomes when medically managed. Randomized studies are needed in order to identify best management.

Results

| Variable | Intermediate N=69 (18.9%) | Uncomplicated N=296 (81.1%) | p-value |
|-----------------------|------------------------------|--------------------------------|---------|
| Management | | | |
| Surgery (%) | 25 (36.2) | 25 (8.4) | <0.001 |
| Medical (%) | 17 (24.6) | 260 (87.8) | <0.001 |
| Endovascular (%) | 27 (39.1) | 11 (3.7) | <0.001 |
| Mortality Rate | | | |
| Overall (%) | 12 (17.4) | 12 (4.0) | <0.001 |
| Surgical (%) | 5 (20.0) | 7 (28.0) | 0.74 |
| Medical (%) | 6 (35.6) | 4 (1.5) | <0.001 |
| Endovascular (%) | 1 (3.7) | 1 (9.1) | 0.50 |

9:00 a.m.

1018-185 Meta-Analysis of Randomized Controlled Trials Found No Benefit of Fish Oil or Omega-3 Fatty Acids on Sudden Cardiac Death or Ventricular Arrhythmias

Peter Danyi, Roger S. Blumenthal, Kashif Chaudhry, Jurga Adomaityte, Rehan Qayyum, Johns Hopkins University School of Medicine, Baltimore, MD

Background: Observational studies have suggested that regular intake of fish may reduce the risk of sudden death and cardiac arrhythmias. However, clinical trials have not found a consistently a benefit of treatment with fish oil or omega-3 fatty acid (O3FA).

Methods: We performed a meta-analysis of clinical trials that had evaluated the effect of treatment with fish oil or O3FA on sudden cardiac death and ventricular fibrillation (VF) or ventricular tachycardia (VT). Randomized controlled trials of fish oil or O3FA treatment versus no treatment were identified by searching PubMed, EMBASE, Cochrane Clinical Trials Register, hand-search of the references of retrieved articles, and by soliciting help from experts in the field. Studies that included sudden death, VT, or VF as outcomes were included in this meta-analysis.

Results: Six trials, including 31,356 patients, (median age 61 years, range 48 to 66 years; males 85%, range 31% to 95%, median follow-up 18 months, range 12 to 55 months) met inclusion criteria. There were 138 sudden deaths among the subjects who were given fish oil or O3FA as compared to 185 sudden deaths among the non-treated subjects with an odds ratio (OR) of 0.77 and 95% confidence interval (CI) of 0.49 to 1.22. Similarly, treatment with fish oil or O3FA had no effect on VT or VF (198 vs. 211 events, OR = 0.97, 95% CI = 0.54 to 1.75).

Conclusions: We did not find a benefit of treatment with fish oil or O3FA on decreasing the risk of sudden death or ventricular arrhythmias.

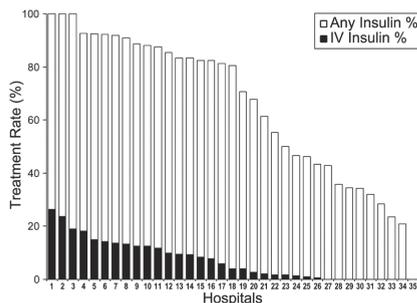
1018-186 Variability in the Hospital Use of Insulin to Control Sustained Hyperglycemia Among Acute Myocardial Infarction Patients

Mikhail Kosiborod, Silvio Inzucchi, Bobby Clark, Harlan M. Krumholz, Philip G. Jones, John A. Spertus, Mid America Heart Institute of Saint Luke's Hospital, Kansas City, MO, Cerner Corporation, Kansas City, MO

Background: American Heart Association recommends "normalization" of blood glucose (BG) in patients with acute myocardial infarction (AMI). Insulin, given subcutaneously or as intravenous infusion (IV) is the most effective method of BG control in-hospital. National patterns of insulin use to control hyperglycemia in AMI patients are unknown.

Methods: We used Cerner Corporation's Health Facts™, a national database based on electronic medical records at 39 hospitals that contribute patients' demographic, clinical, comprehensive laboratory and pharmacy data. Hospitals are located in the Northeast (53%), Midwest (23%), South (17%) and West (7%); 24% are teaching, 92% urban, and 23% have >500 beds. We analyzed rates of documented insulin use in 2132 AMI patients with mean hospitalization BG>200 mg/dL admitted from January 2000-December 2005.

Results: Only 1370 patients (64%) received any insulin, and 161 patients (7.5%) received IV insulin. There was marked variability among hospitals in the frequency of insulin use (Fig.). Rates for any insulin varied from 0%-100%, and for IV insulin from 0%-26%. In 39% of hospitals, majority of patients with marked hyperglycemia received no insulin. Nearly a third of hospitals (28%) did not use IV insulin even once.



Conclusions: Although there is variability in the use of insulin to control hyperglycemia in AMI patients, the rates of use in most hospitals are inappropriately low. Few hospitals use IV insulin even in the setting of significant, sustained hyperglycemia.

9:00 a.m.

1018-187 The Relationship Between Change in Hematocrit and Change in Health Status in Patients With Heart Failure After Myocardial Infarction

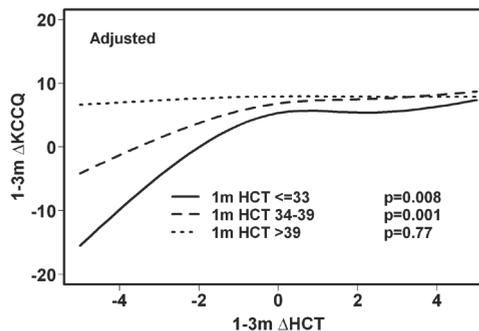
Mikhail Kosiborod, Harlan M. Krumholz, Philip G. Jones, Bertram Pitt, John A. Spertus, Mid America Heart Institute of Saint Luke's Hospital, Kansas City, MO

Background: Studies have identified anemia as a potential target for intervention in patients (pts) with heart failure (HF), with the goal of improving survival and health status. However, whether changes in hematocrit (Hct) are associated with changes in health status among HF pts is unknown.

Methods: We studied 1474 pts with HF after myocardial infarction that participated in the EPHEBUS study and had serial assessments of Hct and health status with the Kansas-City Cardiomyopathy Questionnaire (KCCQ). Linear regression models assessed the relationship between change in Hct and concomitant change in health status between 1 month (baseline) and 3 month after hospitalization.

Results: During follow up, 12.6% of pts had >2% decline in Hct, 32.5% had >2% increase in Hct, and 54.9% had no change in Hct. After multivariable adjustment, there was a highly significant interaction between baseline Hct, change in Hct and change in health status. The association was non-linear. Pts with severe anemia at baseline (Hct ≤33%) who's Hct further declined, had marked decrements in health status, while health status gains associated with Hct improvements were small. The magnitude of Hct-associated health status change was less pronounced in pts with baseline Hct >33-39%, and not significant in pts with normal Hct (>39%) at baseline (Figure).

Conclusions: Among anemic pts with HF, decrease in Hct is associated with marked decline in health status, while health status gains associated with Hct improvements are minimal.



9:00 a.m.

9:00 a.m.

1018-188 i-Trial: An Innovative Internet System for the Complete Management and Monitoring of International Multicenter Clinical Studies.

Domenico Cianflone, Nicole Cristell, Stefano Coli, Marco Magnoni, Sara Pagani, Azeem Latib, Susan Spears, Neal Uren, Hui Li, Daji Hu, Attilio Maseri, on behalf of the FAMI Study Investigators, Università Vita-Salute San Raffaele, Milano, Italy

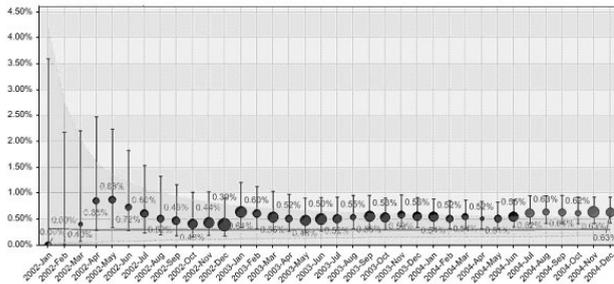
Management, monitoring and quality control of multicenter, international clinical studies and trials are complex and resource consuming. Electronic off- and on-line Case Report Forms (CRF) are sometimes used to shift the burden of data entry to the investigators. Still, study monitoring relies on human resources that have to travel and follow complex data verification procedures. To overcome these limitations, time constraints and related costs, we developed a real-time, internet framework (i-Trial) for data collection, control and verification of CRFs and for management, progress monitoring and quality control. No single data management or office package is capable of fulfilling all the complex requirements for these tasks, thus we integrated a set of commercially available tools. The core is an industry standard SQL database (Oracle 9i) and its web-portal. This combination provides the internet CRFs, granting each individual investigator access to, and only to, his/her cases while providing immediate feedback with first tier warnings for inconsistencies, incompleteness, and deadlines. The study monitor can access all data from all investigators to perform control procedures on data completeness and deadlines. We then obtained a higher level of control by developing procedures, reports and charts that query the on-line database through a secure ODBC connection. The front-end includes a querying and reporting application (via DataEase 6.5), executive reports (via Crystal Reports) and summary tables and charts (via Graph Pad Prism4). Data security was implemented by server access control policies, SSL, data codification and encryption. We applied i-Trial to the ongoing First Acute Myocardial Infarction (FAMI) Study, which has enrolled over 1000 cases and controls in Italy, China and Scotland to study the inflammatory, genetic and environmental pathogenetic components of acute myocardial infarction in three populations. We hence developed 32 relational tables, the corresponding data-entry forms/CRFs and over 40 control reports. As a result, this integrated managing system enabled study monitors and the steering committee to remotely manage 31 centers and over 1000 study cases.

9:00 a.m.

1018-189 Use of an Automated Monitoring Tool in the Evaluation of Retroperitoneal Hemorrhage following the use of a Vascular Closure Device in PCI

Michael E. Matheny, Nipun Arora, Timothy C. Lee, Frederic S. Resnic, Brigham & Women's Hospital, Boston, MA

Background: Increasing use of clinical outcomes databases has created new opportunities for automated safety surveillance of medical devices. We used an automated monitoring system to monitor the rate of retroperitoneal hemorrhage (RPH) after the use of a vascular closure device (VCD) following PCI.
Methods: A local prospective outcomes registry was used consisting of 3, 947 consecutive patients receiving a VCD after undergoing PCI through the transfemoral route from January 1, 2002 to December 31, 2004. There were 25 cases complicated by RPH, all of which were confirmed by CT imaging. A real-time automated monitoring system (DELTA) was used to analyze this data using a logistic regression adjusted statistical process control method. Expected event rates and confidence intervals (CI) were established from the literature.
Results: The cumulative event rate ranged from 0.39% to 0.88%. The final cumulative event rate was 0.63%, and generated alerts for the last 6 months when the observed event rate exceeded the upper CI threshold of the expected event rate (0.50%). After adjustment for other clinical and demographic factors, high femoral arterial puncture was found to independently predict the risk of RPH, while the use of a VCD did not.



Conclusions: Automated safety surveillance of medical devices is feasible using routine clinical outcomes databases. This example illustrates the benefit of automated safety surveillance to support identification of low frequency safety signals in cardiovascular care.

1018-190 Ultrasound Lung Comet Is Useful And Specific Sign Of Lung Disease: Importance Of Doppler Study To Diagnose Lung Congestion

Masao Takeda, Hiroshi Ito, Katsuomi Iwakura, Shigeo Kawano, Atsunori Okamura, Toshiya Kurotobi, Yasushi Koyama, Motoo Date, Koichi Inoue, Kenshi Fujii, Sakurabashi Watanabe Hospital, Osaka, Japan

Background: Ultrasound lung comet (ULC), that consists of multiple comet-tails fanning originating from the lung surface, is a simple echographic sign of lung edema. It, however, are also observed in cases of organic lung disease. In this study, we investigated whether we can diagnose the presence of lung disease with ULC and whether additional Doppler examination can differentiate heart failure from (HF) lung disease.
Method: Study population consisted of 60 patients admitted our hospital complaining of acute respiratory distress (ARD). 100 patients without HF or lung disease were served as controls. We performed ultrasound scanning from the third intercostals space on anterior axial line and counted number of ULC. We measured the ratio of peak-E velocity to early diastolic mitral annulus velocity, E/e', and E/e' ≥ 15 was regarded as a sign of lung edema.
Results: ULC was detected in all ARD patients but was not observed in normal subjects. In 30 patients (50%), E/e' was ≥ 15 and right-heart catheterization confirmed the presence of HF. Number of ULC was correlated with NYHA class (II vs. III vs. IV: 2.0 vs. 2.5 vs. 3.3, p<0.01). There was good correlation between number of ULC and E/e' (r=0.64, p<0.0001). ULC disappeared in 20 patients (66.7%) after diuretics and the patients with permanent ULC had baseline lung disease. The presence of the organic lung disease was confirmed in all 30 patients with E/e'<15, including pneumonia, interstitial pneumonia, lung emphysema, old tuberculosis and pulmonary asbestosis. Among these patients, there was no correlation between number of ULC and E/e'(r=0.018,p=0.93).
Conclusion: ULC is useful and specific sign to diagnose ARD. There are two etiologies of ULC; lung edema and organic lung disease. An increase in E/e' > 15 is useful to diagnose the contribution of HF to acute respiratory distress.

9:00 a.m.

1018-191 Global Cardiovascular Disease Research Census

Poornima Prabhakaran, Vamadevan S Ajay, Arunkumar Gottumukkala, Shrihari JS, Uma Snehi, Bijoy Joseph, Dorairaj Prabhakaran, Srinath K Reddy, Initiative for Cardiovascular Health Research in the Developing Countries, New Delhi, India

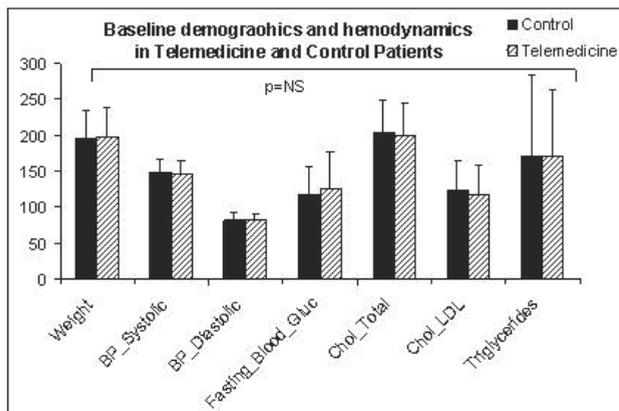
Background: The exact quantification of cardiovascular disease (CVD) related research is not known from the developing countries. In this context we undertook a census on CVD related publications with an objective to estimate the quantum and profile of published literature on CVD in developed and developing countries.
Methods: We searched the PUBMED database using the search terms Cardiovascular (*), heart (*), Coronary (*), heart failure (*), rheumatic (*), disease (*), "Country name" for top 21 countries from each categories of high income (HIC), High middle income (HMIC), low middle income (LMIC) and low income countries (LIC). Purposive additions of large/most populous countries (China, Russia, South Africa, Argentina, Egypt, Indonesia and Bangladesh) were also made. Search was limited to publications involving human studies for the periods 1994-95 and 2004-2005 published in all languages.
Results: Of all the publications from the 91 countries, CVD related publications accounted for 6.4%. United States had highest number of publications (6161). 82% of the CVD related publications were from top 21 HIC comprising 11% of the global population while top 21 LIC with 25% of the world's population had just 3% of the publications. Top 21 LMIC, with 28% of global population, had 7% of the CVD related publications while 5% of the CVD publications came from top 21 HMIC which accounted for 4% of the world population. Studies on health system, cost effectiveness/costing and quality of care related to CVD care comprised 7% of the articles from HIC while LIC had no such publications.
Conclusions: This study points to the dearth of evidence based strategies for combating the CVD epidemic in developing countries. Hence research needs to be supported in these countries to provide knowledge and evidence for policies, to improve health systems and to evaluate cost effectiveness of CVD control strategies.

9:00 a.m.

1018-192 Preliminary Outcome of Web-based Telemedicine Clinical Trial for Disease Management: Comparison of 4-versus 8-months follow-up visits

Abul Kashem, William P. Santamore, Robert C. Cross, Carol J. Homko, Linda Zamora, Philip T. Berger, Francis Menapace, Timothy McConnell, Alfred A. Bove, Temple University, Philadelphia, PA, Geisinger Health System, Danville, PA

Background: We hypothesize that a web-based telemedicine (T) monitoring system in underserved inner city and rural Pennsylvania subjects would help to reduce the cardiovascular risk factors.
Methods: A total of 465 patients were recruited for a clinical trial and randomized to a Telemedicine (T) and control arm (C-usual practice). We reviewed 295 patients who have been followed for 4-(v1) and 8-months visits (v2). Each patient received a digital sphygmomanometer and a pedometer. T-patients transmitted weekly blood pressure, weight, step data and cigarette smoking using the T system. All patients were followed by their primary care physicians who were provided 4 and 8 month summary data. We compared the v1 vs. v2 clinical outcome in this population (T vs. C).



Results: T-147 patients, mean age-62±9, BMI-31±6, HbA1C 6.8±1.6, CRP 0.4±0.6; C-148 patients, mean age-63±10, BMI-31±6; HbA1C 6.3±1.2, CRP-0.4±0.4. The graph shows baseline hemodynamics and demographics in T and C-patients. Framingham risk score during v1 and v2 was reduced for both T and C (T: v1-16.9%→v2-14.3%; p=0.001; C: v1-16.9%→v2-14.8%; p=0.001). Interval changes (v1→v2) showed significant improvement for systolic blood pressure (p=0.016), metabolic syndrome score (p=0.041), HbA1C (p=0.003), fasting blood sugar (p=0.037) only in the T-group.

Conclusions: These data suggest a web-based telemedicine monitoring system may work for disease management and help in reducing cardiovascular risk factors.

9:00 a.m.

1018-193 Patient Refined Expectations Deciding Invasive Cardiac Treatment (PREDICT)

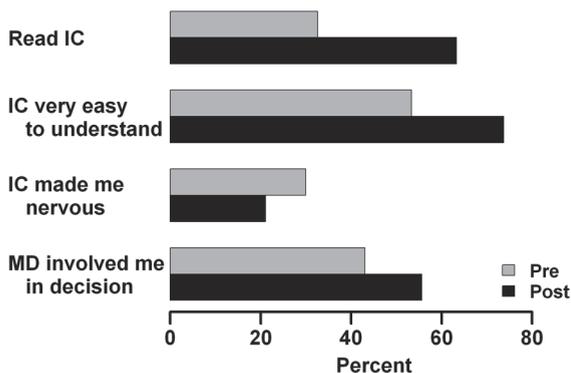
Carole J. Decker, Homaa Ahmad, Gabriel E. Soto, Mikhail Kosiborod, Kimberly J. Reid, Philip G. Jones, John A. Spertus, Mid America Heart Institute, Kansas City, MO

Background: The Institute of Medicine (IOM) challenged healthcare to be more evidence based, transparent and patient centered. Excellent risk adjusted models for percutaneous coronary intervention (PCI) have been developed, yet have not been used clinically to inform patients about potential risks and benefits. We developed a web-based program, PREDICT, to embed validated multivariable models into individualized informed consents (IC) for PCI.

Methods: PREDICT was integrated into the IC process at Mid America Heart Institute in Kansas City on 8/28/2006. Prior to implementation, 93 patients were interviewed to quantify their understanding and reaction to the standard IC. The first 30 patients who used PREDICT were assessed.

Results: The pre and post PREDICT cohorts had similar patient characteristics (age, gender, cardiac history and co-morbidities). There was a significant increase in the proportion of patients who read the IC (from 32% to 63%) with the introduction of PREDICT (p=0.003). Improvements in comprehension and physician-patient communication, as well as reduction in patient anxiety about the procedure were observed (Figure).

Conclusion: Individualized consent forms with patient-specific risks for PCI are associated with improved patient reading of the IC, increased comprehension, and reduced anxiety. Increased patient involvement moves practice towards shared decision-making. This preliminary data suggests the PREDICT tool can be used to support IOM goals of improved healthcare.



1024

Special Topics

Monday, March 26, 2007, 1:30 p.m.-5:00 p.m.
Hall H

1:30 p.m.

1024-146 Retroperitoneal Hematoma after PCI: Prevalence, Risk Factors, Predictors, Management and Outcomes. Results from The Blue Cross Blue Shield of Michigan Cardiovascular Consortium (BMC2) Registry.

Santi Trimarchi, Dean E. Smith, David Share, Michael O'Donnell, Richard McNamara, Arthur Riba, Eva Kline-Rogers, Mauro Moscucci, University of Michigan Medical Center, Ann Arbor, MI, Policlinico San Donato, San Donato, Italy

Background: To determine the prevalence, risk factors and outcome of retroperitoneal hematoma (RPH) after contemporary percutaneous coronary intervention (PCI).

Methods: The study sample included 68,735 patients undergoing contemporary PCI in a large, multicenter, validated, regional PCI registry between October 2001 and December 2005. The primary endpoint evaluated was the development of retroperitoneal hematoma. Multivariate logistic regression modeling was used to identify independent predictors for the development of RPH.

Results: RPH occurred in 290/68,735 patients (0.4%). Of the patients who developed RPH, 94.8% were treated medically and 5.2% underwent surgical repair. Multivariate logistic regression analysis identified female gender (adjusted OR 3.60), body surface area <1.8 m² (adjusted OR 1.73), emergency procedure (adjusted OR 1.57), history of atrial fibrillation (adjusted OR 1.53), cardiogenic shock (adjusted OR 2.14), use of pre-procedural IV heparin (adjusted OR 1.51), use of GP IIB/IIIa (adjusted OR 1.98), and use of vascular closure devices (adjusted OR 1.76) as independent predictors of RPH. Prior history of PCI appeared to be protective (adjusted OR 0.72) The development of RPH was associated with a higher frequency of post procedure MI (6.6% vs. 1.7%, p<0.0001), infection and/or sepsis (15.2% vs. 2.8%, p<0.0001), and congestive heart failure (9.7% vs. 2.0%, p<0.0001). In-hospital mortality was significantly higher in patients who developed RPH when compared with patients who did not (7.2% vs. 1.1%; p<0.0001). In addition, a non significant trend toward a higher in-hospital mortality was observed in patient with RPH treated surgically when compared with patients treated medically (13.3% vs. 6.9% P=0.34).

Conclusions: RPH is an uncommon complication of contemporary PCI, and it is associated with high morbidity and mortality. It remains to be determined whether the identification of risk factors for the development of RPH might lead to modification of procedure strategies aimed toward reducing its incidence.

1:30 p.m.

1024-147 Impact Of Guidelines Based Protocol On Timeliness Of Reperfusion For Patients Presenting During Regular-hours And Off-hours

Henry H. Ting, David R. Holmes, Bernard J. Gersh, Luis H. Haro, Christine M. Bjerke, Choon-Chern Lim, Ryan J. Lennon, John F. Bresnahan, Allan S. Jaffe, Malcolm R. Bell, Charanjit S. Rihal, Mayo Clinic, Rochester, MN

Background: Previous studies have shown that off-hours presentation with ST-elevation myocardial infarction (STEMI) is associated with delayed door-to-balloon (DTB) and door-to-needle (DTN) times. We evaluated a guidelines based protocol to improve timeliness of reperfusion during regular-hours and off-hours.

Methods: From 2004 to 2006, 417 consecutive patients were enrolled in a Fast Track protocol for STEMI. The catheterization lab committed to a response time of 20-30 minutes after activation. Off-hours patient presentation was defined as Saturday, Sunday, or Monday - Friday from 5PM to 8AM. Patients presenting to the emergency department (ED) in Rochester, Minnesota were treated with primary PCI (ED PCI, n=203). Patients presenting to one of 25 regional hospitals (RH) located within 120 nautical miles from Rochester were treated with fibrinolysis (LYTIC) if symptom duration was < 3hours (RH LYTIC, n=125) and with primary PCI if symptom duration was > 3hours (RH PCI, n=103).

Results: A total of 149 (35.7%) patients presented during regular-hours versus 268 (64.3%) patients during off-hours. DTB, DTN, and in-hospital outcomes for regular-hours versus off-hours presentation for each subgroup are shown in the Table.

| | Regular-hours n=149 | Off-hours n=268 | P |
|---------------------------------|------------------------|--------------------|------|
| ED PCI DTB, median (minutes) | 63 | 68 | 0.32 |
| ED PCI DTB <90 minutes | 84% | 80% | |
| RH PCI DTB, median (minutes) | 118 | 116 | 0.68 |
| RH PCI DTB <90 minutes | 9% | 14% | |
| RH LYTIC, DTN, median (minutes) | 23 | 28 | 0.64 |
| RH LYTIC DTN <30 minutes | 69% | 60% | |
| Death | 5 (3.4%) | 11 (4.3%) | 0.67 |
| Death or myocardial infarction | 9 (6.0%) | 20 (7.5%) | 0.58 |

Conclusions: A guidelines based Fast Track protocol achieved similar DTB, DTN, and in-hospital outcomes for patients presenting during regular-hours or off-hours. These findings were consistent for patients presenting to a hospital ED with on-site PCI or to RH without on-site PCI.

1:30 p.m.

1024-148

Ten Year Secular Trends And Characteristics Associated With Patient Delay From Symptom Onset To First Hospital Arrival In ST-elevation Myocardial Infarction

Henry H. Ting, Elizabeth H. Bradley, Yongfei Wang, Brahmajee K. Nallamothu, Jephtha P. Curtis, Judith H. Lichtman, Veronique L. Roger, Bernard J. Gersh, Harlan M. Krumholz, Mayo Clinic, Rochester, MN, Yale University, New Haven, CT

Background: Despite improvements in door-to-balloon and door-to-needle time in ST-elevation myocardial infarction (STEMI), patient delay (PD) from symptom onset to first hospital arrival remains prolonged.

Methods: We analyzed 10 year secular trends and characteristics associated with PD among 482,327 patients with STEMI enrolled in the National Registry of Myocardial Infarction from 1995 to 2004. PD was defined as time from symptom onset to first hospital arrival.

Results: Median PD was 104 min over the 10 year period, and decreased from 108 minutes in 1995 to 98 minutes in 2004 (p<0.0001). In multivariable analysis, some key characteristics associated with PD and their median estimates ± 95% confidence interval are shown in the Table. Subgroups with prolonged PD included: female and age ≥80 (median 134 minutes); nonwhite race and age ≥80 (median 130 minutes); and Medicare only and age ≥80 (median 130 minutes). Among patients eligible for reperfusion, the longer the PD, the less likely for a patient to receive any reperfusion therapy. Reperfusion therapy was given in 46% for PD 11-12 hours compared to 76% for PD <1 hour (p<0.0001).

| Description | Estimate of Patient Delay In Minutes | | | |
|-----------------------------------|--------------------------------------|-------------------------|--------|--------|
| | PD | 95% Confidence Interval | P | |
| Age | | | | |
| Age<60 | Reference | | | |
| Age 60 to 69 | 9.68 | 8.63 | 10.73 | <.0001 |
| Age 70 to 79 | 20.49 | 19.07 | 21.91 | <.0001 |
| Age>=80 | 30.70 | 28.89 | 32.53 | <.0001 |
| Female | | | | |
| No | Reference | | | |
| Yes | 13.04 | 12.18 | 13.90 | <.0001 |
| Non-white | | | | |
| No | Reference | | | |
| Yes | 8.72 | 7.59 | 9.84 | <.0001 |
| Health insurance | | | | |
| Commercial (HMO/PPO) only | Reference | | | |
| Medicare only | 7.55 | 6.40 | 8.71 | <.0001 |
| Medicare with any other insurance | 2.23 | 0.87 | 3.61 | 0.0012 |
| Medicaid or Self | 6.85 | 5.58 | 8.14 | <.0001 |
| Diabetes | | | | |
| No | Reference | | | |
| Yes | 21.01 | 19.98 | 22.04 | <.0001 |
| Time of presentation: off hour | | | | |
| No | Reference | | | |
| Yes | -10.92 | -11.69 | -10.15 | <.0001 |

Conclusions: PD has not decreased substantially over the past 10 year period from 1995 to 2004. Increased PD is associated with a lower likelihood of receiving any reperfusion therapy. Interventions to improve PD should target high risk groups and characteristics associated with prolonged PD.

1:30 p.m.

1024-149

“Virtual Superiority”: A New Composite Score for Grading the Quality of Noninferiority Cardiovascular Clinical Trials

Sanjay Kaul, George A. Diamond, Cedars-Sinai Medical Center, Los Angeles, CA

Background and Objective: Analysis of noninferiority (NI) should ideally be founded on 3 prerequisite judgments: 1) new treatment (N) exhibits NI to the standard treatment (S), 2) N exhibits efficacy in a placebo-controlled trial, and 3) N offers noninferiority benefits in safety, convenience or cost. We hereby propose a new composite score by which each of these attributes is graded on a 0 (unestablished) to 1 (established) scale. A score of 3 out of 3 supports a judgment of so-called “virtual superiority” to justify consideration of N over S.

Methods: Four recent NI trials were analyzed. A conservative estimate of NI margin (d) was derived as 50% of the 95% lower limit of a random-effects meta-analytic estimate of historical odds ratio (OR). NI was established if 95% upper limit of observed OR < margin. Efficacy was established if N was superior to “imputed placebo” (derived OR<1). Noninferiority superiority was established if OR for safety (major bleeding) <1.

Results: Efficacy was established in all trials and noninferiority superiority in 2 (REPLACE-2, ACUITY bivalirudin alone). However, in none of the trials was a judgment of “virtual superiority” supported, primarily due to lack of establishment of therapeutic NI using conservative criterion.

Conclusion: Balancing risks and benefits should be integral to the interpretation of NI trials. The composite score for assessment of “virtual superiority” may provide a useful tool for avoiding introduction of suboptimal treatments into routine clinical practice.

| Trial | Observed OR, (New vs Standard) | Historical OR, (Placebo vs Standard) | Margin (OR) | Non-Inferiority Conclusion | Derived OR, (New vs Placebo) | Efficacy Conclusion | Noninferiority Superiority Conclusion | Composite Score |
|--|--------------------------------|--------------------------------------|-------------|----------------------------|------------------------------|---------------------|---|-----------------|
| | (95% CI) | (95% CI) | d | | (95% CI) | | | |
| REPLACE-2 (Bivalirudin vs Hep + GPI) | 1.09 (0.92, 1.32) | 1.79 (1.42, 2.27) | 1.19 | No (0) | 0.61 (0.45, 0.83) | Yes (1) | Yes (1) ↓ major bleeding (more convenient) | 2 |
| A-to-Z (Enoxaparin + tirofiban vs Hep + tirofiban) | 0.88 (0.71, 1.09) | 1.47 (1.11, 1.92) | 1.06 | No (0) | 0.60 (0.42, 0.85) | Yes (1) | No (0) No ↓ major bleeding (more convenient) | 1 |
| SYNERGY (Enoxaparin + GPI vs Heparin + GPI) | 0.96 (0.85, 1.07) | 1.10 (1.02, 1.18) | 1.01 | No (0) | 0.87 (0.76, 0.99) | Yes (1) | No (0) ↑ major bleeding (more convenient) | 1 |
| ACUITY (Bivalirudin vs Hep/Enoxaparin + GPI) | 1.06 (0.91, 1.24) | 1.79 (1.42, 2.27) | 1.19 | No (0) | 0.59 (0.45, 0.79) | Yes (1) | Yes (1) ↓ major bleeding (more convenient) | 2 |
| ACUITY (Bivalirudin + GPI vs Hep/Enoxaparin + GPI) | 1.08 (0.92, 1.26) | 1.79 (1.42, 2.27) | 1.19 | No (0) | 0.60 (0.45, 0.80) | Yes (1) | No (0) No ↓ major bleeding | 1 |

1:30 p.m.

1024-181

Effects of Drug-Eluting Stents on Hospital Readmission Rates and Long-term Repeat Revascularization: Outcomes from a Large Clinical Registry

Kent G. Meredith, Anwar Tandar, Donald L. Lappé, Heidi T. May, Andrew D. Michaels, Jeffrey L. Anderson, Tami L. Bair, Joseph B. Muhlestein, LDS Hospital, Salt Lake City, UT, University of Utah, Salt Lake City, UT

Background: Drug-eluting stents (DES) have been shown to dramatically reduce the incidence of restenosis and clinically-driven target lesion revascularization (TLR). However, the impact of DES on long-term TLR, target-vessel revascularization (TVR), and hospital readmission are unknown.

Methods: Patients who received intracoronary stent placement from 1993-2005 were followed for up to 1000 days from index admission. Patients who received bare-metal stents (BMS) after the DES era (after 2003) were excluded in order to avoid potential bias due to BMS being used primarily in very small or very large arteries and in circumstances that contraindicate extended antiplatelet therapy. Cause of admission (elective/stable angina [SA], unstable angina [USA], or acute myocardial infarction [AMI]) was evaluated to determine if increased disease burden approached percutaneously since the advent of DES resulted in more frequent “elective” readmissions for staged procedures. Multivariate regression models controlled for standard cardiovascular risk factors and presentation.

Results: Patients (N=7466) were predominantly male (74.2%) and had a mean age of 63.5±11.9 years. DES were more likely to be used in patients with hypertension, dyslipidemia, diabetes, and a family history of premature coronary artery disease. Smoking was more prevalent in BMS patients. Compared to DES, patients with BMS had an increased risk of TVR (Hazard Ratio [HR] 1.42, p=0.02) and a trend toward more TLR (HR 1.21, p=0.08). However, the use of BMS was associated with a reduced risk for non-TV (HR 0.44, p<0.001). Despite higher TVR and TLR, BMS patients had decreased hospital readmissions (HR 0.85, p<0.0001). Similar causes of readmission were seen in both DES and BMS groups for SA (53.1% vs. 49.7%), USA (48.8% vs. 48.5%), and AMI (41.8% vs. 38.1%) (p=NS for all comparisons).

CONCLUSION: Despite reduced TVR and TLR, the use of DES is associated with an increased adjusted risk of repeat hospitalization as well as increased non-target vessel revascularization. These results raise the possible concern that currently unrecognized effects of DES beyond TLR/TVR reduction might influence long-term outcomes.

1:30 p.m.

1024-182 Patients With Acute Anginal Symptoms Frequently Do Not Receive Initial Electrocardiography: Results From the Investigation of National Coronary Disease Identification (INCIDENT)

James Li, Nancy L. Reaven, Susan E. Funk, Vernon F. Schabert, Joseph E. Lovett, Anthony N. DeMaria, Strategic Health Resources, La Canada, CA

Background: Although it is generally assumed that patients presenting with anginal symptoms receive a resting electrocardiogram (ECG) at the initiation of cardiac evaluation, few data exist concerning this expectation. Using a very large database comprising 2% of the U.S. adult population, we assessed compliance with the ACC/AHA Guideline recommendations that a resting ECG be the initial diagnostic test for patients presenting with acute chest pain or an anginal equivalent.

Methods: Our study population of commercial and Medicare enrollees numbered 4,355,625 patients. Entry criteria included age over 44 years; continuous enrollment from 2001 through 2003 excepting death; a cardiac test for a diagnosis of coronary disease, heart failure, or a related cardiac symptom in 2001; and presentation with acute anginal symptoms. Exclusion criteria included any cardiac diagnostic test or intervention in the 6 months preceding the first cardiac test. We calculated the proportion of patients who received ECG as the initial diagnostic test. We further stratified these results by gender, age, comorbidities and care setting.

Results: 18,139 patients with acute angina met entry and exclusion criteria: 48% were male and 39% were over 64 years of age. A substantial proportion (35%, 95% confidence interval [CI] 34%-35%) did not undergo an initial resting ECG as recommended by ACC Guidelines. Patients treated in emergency departments received an initial ECG more frequently (91%, CI 90-92%) than patients tested in outpatient settings (61%, CI 60-62%; risk ratio [RR] 0.75, CI for RR 0.74-0.76) or during hospital admissions (34%, CI 32%-37%; RR 0.15, CI for RR 0.14-0.17). Men (RR 0.90 vs. women, CI for RR 0.87-0.93) and patients over 64 years (RR 0.89, CI for RR 0.86-0.92) had slightly lower rates of initial ECG testing.

Conclusions: In our sample of over 4 million subjects, compliance with expert guidelines was highest in emergency departments where most patients with angina or chest pain received a recommended ECG before other tests were done. However, compliance outside of emergency departments was poor. These data support efforts to invigorate or create systems that ensure proper use of diagnostic ECG.

1:30 p.m.

1024-183 In-Hospital Mortality May Not Be A Valid Predictor of Overall Quality of Care In Patients With Myocardial Infarction

Michael C. Kontos, Robert L. Jesse, Laura Kreisa, Charlotte S. Roberts, George W. Vetrovec, Virginia Commonwealth University, Richmond, VA

Background: Results from clinical trials showing improved outcomes in patients (pts) with myocardial infarction (MI) have led quality improvement programs to focus on compliance with these processes of care. In addition to process metrics, in-hospital mortality is often used as a surrogate for quality of care, although the number of deaths in any one hospital may be low, making this measurement unreliable when assessed over short time periods. We studied the impact on overall MI mortality rates of very high risk pts (e.g., cardiogenic shock, cardiac arrest), in whom survival rates are frequently low.

Methods: Data on all pts receiving a primary discharge diagnosis of MI who were admitted emergently was collected as part of a quality assurance program (JCAHO/CMS). Charts were reviewed for standard quality of care indicators. Charts of pts who died were reviewed for co-morbidities and other clinical variables associated with a high risk of death.

Results: Over a 3 year period, 713 MI pts were admitted, of whom 51 died (7.0%) in-hospital. Mean age was age 68±14 (median 71, 54% male), with 20% ≥80 years old. During this time frame, aspirin (98%), beta blocker (99%) and ACEI use (94%) were high. When analyzed in quarter increments, mortality varied from 2.9% to 12.3%, with no consistent trends suggesting an increase or decrease over time. Of the MI pts who died, 39% presented with cardiac arrest, 4% in cardiogenic shock, 8% with stroke, and 12% with end-stage cancer or heart failure, and sepsis. Only 18 (41%) had none of these conditions. Excluding pts with cardiogenic shock and cardiac arrest reduced mortality to 4.1%. Excluding all very high risk pts reduced MI mortality to 3.0%, with no one quarter mortality exceeding 4.7% (4 deaths).

Conclusions: Variability for in-hospital MI mortality is driven by the very high risk pts, particularly those with cardiac arrest, in whom expected mortality is high, and by pts with co-morbidities that often preclude the use of effective interventions. Hospitals with small MI volume, and/or high risk pt populations are at jeopardy for adverse mortality outcomes despite above average guideline adherence. Appropriate risk adjustments are necessary to assess quality of care.

1:30 p.m.

1024-184 Does a Single-Pill Antihypertensive/Lipid-Lowering Regimen Improve Adherence in U.S. Managed Care Enrollees?

Mohammed A. Hussein, Richard H. Chapman, Joshua S. Benner, Simon SK Tang, Henry A. Solomon, Amie Joyce, Joanne Foody, ValueMedics Research, Falls Church, VA, Yale University, New Haven, CT

Objective: We compared adherence with single-pill combination amlodipine/atorvastatin (amlo/atorva) vs. 2-pill regimens of a calcium channel blocker (CCB) + statin in a managed care population.

Methods: A retrospective cohort study was conducted among enrollees in 29 US health plans who filled a CCB and statin within any 30 day window between 3/2004 and 4/2005.

The proportion of days covered (PDC) by both a CCB and statin was calculated at 6 and 12 months post index date. Patients were "adherent" if PDC was ≥80%. Because past medication experience is a strong predictor of future adherence, patients were stratified into 4 groups based on CCB and statin use in the 6 months before index date. Multivariable logistic regression with propensity score weighting was used to adjust for demographic, clinical and health service variables that could be associated with treatment selection and adherence.

Results: At 6 months, single-pill amlo/atorva achieved greater adherence vs. 2-pill amlo + atorva in patients already taking a CCB or a statin (but not both) before the index date (Table). Compared with other 2-pill CCB + statin combinations, single-pill amlo/atorva achieved greater adherence irrespective of prior drug use. Results were consistent at 1 year.

Conclusions: In patients for whom concomitant CCB and statin therapy are indicated, a single-pill combination of amlo/atorva may improve patient adherence. Given the substantial healthcare/economic burden of nonadherence, a single-pill approach is attractive.

Table. Relative odds of being adherent at 6 months (adjusted odds ratio and 95% confidence interval)

| | Amlo/atorva vs. other CCB + statin | Amlo/atorva vs. amlo + atorva |
|--------------------------------------|------------------------------------|-------------------------------|
| Subgroups (prior CCB/statin) | | |
| Naïve/naïve (n = 3593) | 1.29 (1.09, 1.52) | 1.00 (0.82, 1.22) |
| Naïve/experienced (n = 4478) | 2.81 (2.28, 3.46) | 1.72 (1.34, 2.21) |
| Experienced/naïve (n = 2162) | 2.75 (2.26, 3.34) | 2.20 (1.63, 2.96) |
| Experienced/experienced (n = 25,197) | 1.19 (1.06, 1.35) | 1.08 (0.95, 1.23) |

amlo, amlodipine; atorva, atorvastatin; CCB, calcium channel blocker

1:30 p.m.

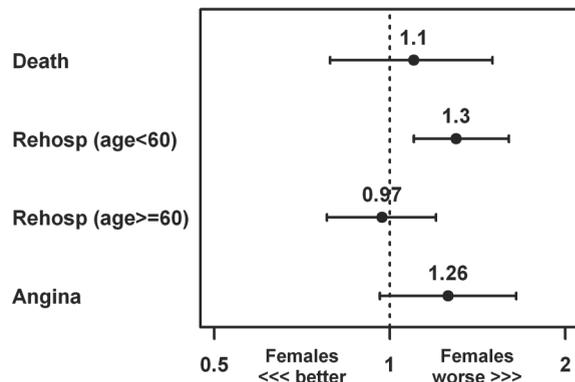
1024-185 Gender Differences in One-Year Outcomes Following Acute Myocardial Infarction: Results from the PREMIER Study

Judith H. Lichtman, Kimberly J. Reid, Carole Decker, Linda Garavalia, Viola Vaccarino, Susmita Parashar, Norrina B. Allen, John A. Spertus, Harlan M. Krumholz, Yale School of Medicine, New Haven, CT, Mid America Heart Institute, Kansas City, MO

Background: Mortality following AMI has been shown to vary with age for women and men, but relatively little is known about non-mortality outcomes. We examined gender differences in rehospitalization, angina symptom burden, and mortality following AMI.

Methods: A total of 2,246 AMI patients (813 women) were prospectively enrolled from 17 US centers from 1/2003-6/2004. Gender differences in one-year outcomes were compared using multivariable proportional hazards regression models (mortality, rehospitalization) and multivariable modified Poisson regression (angina burden: yes/no). Models were adjusted for site, demographic, socioeconomic, clinical, psychological, disease severity, and process of care factors.

Results: Unadjusted 1-year mortality (9.6% vs 6.3%, p=0.003), angina burden (22.4% vs 18.6%; p<0.05), and rehospitalization (43.4% vs 37.8%, p=0.01) were higher for women, especially younger women. In risk-adjusted analyses (figure), mortality risk was similar for men and women (HR 1.10, 95% CI, 0.79, 1.50), but women trended towards a greater risk of angina (OR 1.26, 95% CI, 0.96, 1.65). Younger women (<60 years; HR 1.30, 95% CI, 1.10, 1.60), but not older women (60+ years; HR 0.97, 95% CI, 0.78-1.20) had an increased risk of rehospitalization as compared with men (age*sex interaction p<0.05).



Conclusion: Mortality at one-year following AMI did not differ for men and women, but the burden of angina symptoms and rehospitalization are higher for women, especially younger women.

1:30 p.m.

1:30 p.m.

1024-186 Dual Antiplatelet Agent Failure: A New Syndrome or a Clinical Non-Entity?

Geoffrey D. Barnes, Jin Li, Eva Kline-Rogers, Rebecca Juliar, David F. Armstrong, Kim A. Eagle, Hitinder S. Gurm, University of Michigan Medical Center, Ann Arbor, MI

Background: Aspirin resistance is a well-documented laboratory finding but the effects of clinical aspirin (ASA) failure on patients with acute coronary syndrome (ACS) have been debated. Likewise, there is some recognition of clopidogrel resistance, but the effects of clopidogrel failure are not well understood. We sought to determine the 6-month outcomes of patients who developed an ACS while on ASA or dual antiplatelet agents.

Methods: Of all patients admitted to the University of Michigan between 1999 and 2005 with a diagnosis of ACS, 6-month follow up data was available for 3386. Those were divided into three groups based on medication history: no prior antiplatelet agent, ASA only and ASA + clopidogrel (or ticlopidine). Primary endpoint was the rate of death, MI and stroke or composite major adverse cardiac events (MACE) at 6-months.

Results: While overall rates of MACE were not statistically different between the three groups, there were an excess hazard of recurrent MI in patients with prior dual agent use. There was however no difference in 6-month MI rates between the ASA and ASA+Clopidogrel groups (p=0.53). While dual antiplatelet status was not an independent predictor of 6 month mortality or MACE on multivariable logistic regression, prior ASA use appeared to be marginally protective (OR 0.70, 95% CI 0.50-0.98, P = 0.03)

| Total Patients 3065 | No Antiplatelet Medication 1397 | ASA Only 1413 | ASA+Clop/ Ticl 255 | P-value (chi- squared test) |
|--|---------------------------------------|---------------------|--------------------------|--------------------------------|
| 6-month f/u Death | 101 7.2% | 100 7.1% | 15 5.9% | 0.74 |
| 6-month f/u MI | 45 3.2% | 75 5.3% | 16 6.3% | 0.009 |
| 6-month f/u Stroke | 10 0.7% | 15 1.1% | 3 1.2% | 0.57 |
| 6-month f/u MACE (Death, MI and Stroke) | 153 11.0% | 177 12.5% | 32 12.6% | 0.40 |

Conclusion: Patients who "fail" antiplatelet therapy do not have overall worse prognosis. Our data do not support ASA or dual antiplatelet agent failure as a distinct clinical entity.

1:30 p.m.

1024-187 Impact of Hospital Performance on Underuse of Therapies Among Patients With Chronic Kidney Disease and Non-ST-Segment Elevation Acute Coronary Syndromes

Uptal D. Patel, Fang-Shu Ou, Matthew T. Roe, E. Magnus Ohman, W. Brian Gibler, Eric D. Peterson, Duke Clinical Research Institute, Durham, NC

Background: Chronic kidney disease (CKD) is associated with cardiac events and death, yet underuse of guideline-recommended therapies is widespread. The extent to which hospital performance affects the care of patients with CKD and non-ST-segment elevation acute coronary syndromes (NSTEMI ACS) is unknown.

Methods: We evaluated 81,374 patients with NSTEMI ACS (positive cardiac markers or ischemic ST-segment changes) treated at 327 US hospitals participating in the CRUSADE Initiative. We compared treatment and outcomes of patients by continuous estimates of glomerular filtration rate (GFR) and quartiles of hospital performance, as measured by overall composite adherence to class I guidelines (acute: aspirin, beta-blockers, clopidogrel, heparin, glycoprotein IIb/IIIa inhibitors; discharge: aspirin, clopidogrel, angiotensin-enzyme inhibitors, lipid-lowering agents) in patients without contraindications. Models were adjusted for demographics, clinical factors, and hospital features.

Results: Prescribing rates of recommended therapies were higher among better performing hospitals (all p <.001), but decreased with declining GFR (all p .05). However, for most discharge therapies, better performing hospitals were more likely to have similar prescribing rates across the GFR spectrum (interaction, p <.05).

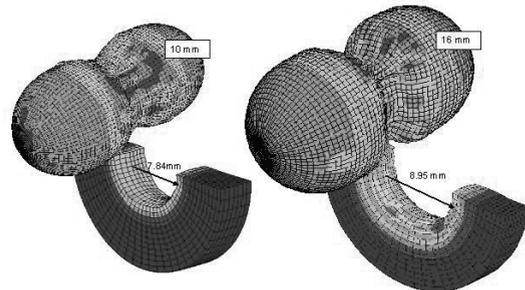
Conclusions: Patients with declining kidney function admitted with NSTEMI ACS are less likely to receive evidence-based therapies and interventions. Although higher performing hospitals have better rates of prescribing at all levels of kidney function, the paradoxical underuse among patients at highest-risk persists for most acute therapies but is mitigated for most discharge therapies. Thus, efforts to promote adherence to NSTEMI ACS guidelines may result in more favorable prescribing rates of recommended therapies among patients with CKD who are at particularly high-risk for adverse outcomes. Nonetheless, the reasons for persistently low prescribing rates of acute therapies at lower levels of renal function need to be explored.

1024-188 Big Balloons Achieve Better Dilatation Results Below Burst Pressure Than Small High-Pressure Balloons - A Biomechanical Analysis

Johannes Nordmeyer, Claudio Capelli, Silvia Schievano, Philipp Lurz, Lorenza Petrini, Simone Lattanzio, Francesco Migliavacca, Philipp Bonhoeffer, UCL Institute of Child Health and Great Ormond Street Hospital for Children, London, United Kingdom, Structural Engineering Department, Politecnico di Milano, Milan, Italy

Background: Stenotic lesions resistant to balloon dilatation are clinically relevant in interventional cardiology. Strategies have been developed to overcome this problem, which differ balloon pressure and size. We questioned the belief, that balloon pressure would have a greater impact on expansion forces than balloon size.

Methods: In a biomechanical model, finite element analyses were performed to simulate the angioplasty procedure. We established a three-dimensional model of a vessel with a lumen diameter of 18 mm, obstructed by a 7mm-thick cylindrical stenosis. Two identical non-compliant balloons were designed, which only differed in nominal maximum diameters (10 and 16 mm). The balloons were inflated at different pressures to evaluate the stress distribution (Von Mises Stresses) and diameter change at the stenotic site.



Results: In order to dilate the stenosis to 10 mm lumen diameter, the bigger balloon needed less pressure (4.8 atm) than the smaller balloon (6 atm). At the same stress distribution on the balloons (polymeric material failure stress = risk of balloon rupture), inflation of the bigger balloon resulted in a greater lumen diameter compared to the smaller balloon (8.95 mm versus 7.84 mm, Figure).

Conclusions: Contrary to common belief, pressure is not linearly related to expansion forces. With identical balloon material, the bigger balloon achieves better dilatation below burst pressure.

1:30 p.m.

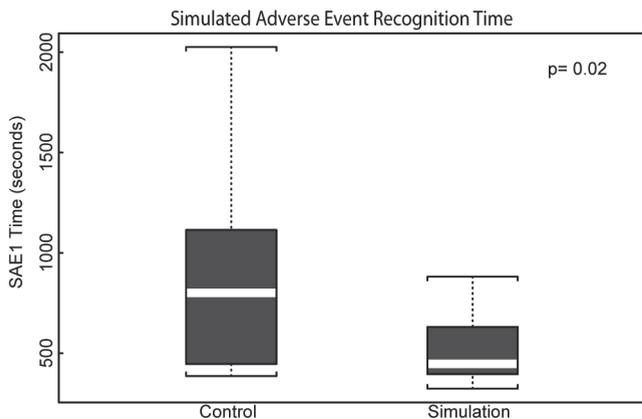
1024-189 The Use of Simulation-based Training to Enhance Patient Safety for Cardiac Catheterization: A Randomized Controlled Multi-Center Study

Andrew J. Klein, John C. Messenger, John Combes, John S. Rumsfeld, Mary Pittman, Samantha MaWhinney, Kathy Kioussopoulous, John D. Carroll, University of Colorado Health Sciences, Denver, CO, Health Research and Educational Trust, Chicago, IL

Background: Recognition of adverse events during cardiac catheterization is critical to reduce morbidity and mortality. Trainees develop these skills through an apprentice model with minimal formal didactic training. Simulation-based training is a novel tool, but randomized controlled trials (RCT) in cardiovascular care are lacking.

Methods: We conducted a multi-center RCT, involving 28 cardiology fellows, comparing standard of care (n=15) to simulation-based patient safety curriculum (n=13). The control group was provided clinical guidelines for cardiac catheterization. The study group completed six patient safety training modules with the simulated cases. All subjects completed a pre- and post-test multiple choice questionnaire (MCQ) in addition to the simulated cases. Each case had a simulated adverse event (SAE). Each group's time to recognition of a SAE and performance on the MCQs were compared using Wilcoxon rank sum tests.

Results: Pre-test performance was equivalent. (68% correct in both). Compared to controls, simulation-trained subjects performed better on the post-exam (66% vs. 52%, p<.0001) and in their recognition of a SAE (448 seconds vs. 801 seconds, p=.02) (Fig.1). Of interest, 22% of SAE's were not recognized by cardiovascular trainees.



Conclusions: This study demonstrates that simulation-based cardiac catheterization training is feasible and leads to a greater knowledge base and improved recognition and management of commonly encountered adverse events in the cath lab.

1:30 p.m.

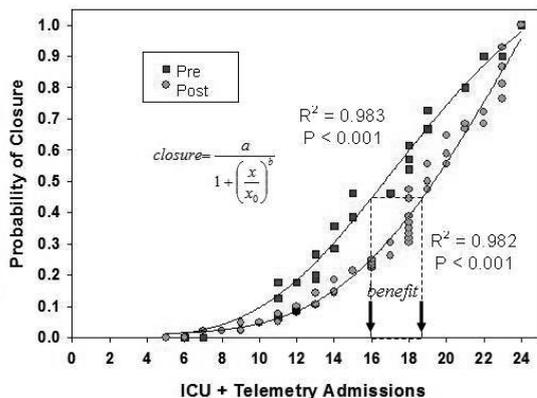
1024-190 Optimizing Use of Telemetry Resources in an Academic Medical Center

Elden R. Rand, Paul B. Lamb, Bernie J. Rubal, Joseph C. Lee, Brooke Army Medical Center, Fort Sam Houston, TX

Background: The optimal management of telemetry assets is poorly defined in the literature. In our academic medical center, telemetry related closures were increasing, leading to loss of educational opportunities and lost revenue. Hence this project was undertaken to improve telemetry utilization in our facility.

Methods: A multidisciplinary telemetry policy was drafted which delineated proper use of telemetry beds. Prior to implementation, baseline telemetry use was prospectively assessed in 162 consecutive telemetry admissions using prespecified endpoints. Telemetry use post-implementation was then assessed in 1025 consecutive admissions. All codes and deaths were independently reviewed, and admission and closure data were analyzed.

Results: Numerous improvements were seen with implementation of the new policy. Appropriate telemetry admissions increased from 76.5% to 91.8% (p<0.001); appropriate duration of use increased from 66.7% to 81.4% (p<0.001); telemetry ordering compliance increased from 78.4% to 89.9% (p<0.001); management changes directly related to telemetry use remained unchanged at 10.5% to 10.7% (p=NS). A predictive logistic model showed a 17% increase in daily hospital closure threshold (figure).



Conclusions: Implementation of a universal telemetry policy and a multidisciplinary team approach increased the hospital admission capacity for telemetry patients without an increase in personnel, unit beds, cost, or compromise of patient care and safety.

1:30 p.m.

1024-191 Prediction of Long-Term Survival in Revascularized Coronary Artery Disease Patients

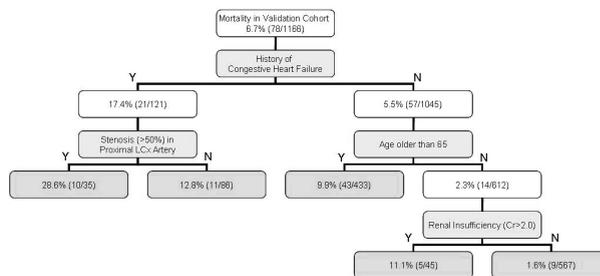
Shun Kohsaka, Masashi Goto, Vei Vei Lee, Tharak Reddy, MacArthur A. Elayda, Noriaki Aoki, James M. Wilson, Texas Heart Institute, Baylor College of Medicine, Houston, TX

Background: Little is known about whether findings of detailed angiographic data can be combined with other clinical risk factors to offer precise guidance about long-term outcome in patients with coronary artery disease (CAD).

Methods: We identified 2661 patients with CAD who underwent an initial revascularization procedure by either stenting or CABG between January 1995 and December 1999 to develop a risk stratification model. We used decision tree induction to develop a practical and user-friendly method of risk stratification for 5-year survival among patients who underwent

coronary revascularization procedures. Initially, 1495 patients were analyzed to develop a decision tree and the validity of the tree was tested using data from 1166 patients.

Decision Tree with Long-Term Mortality Rate of Validation Cohort



Results: The overall mortality rate was 6.6% at a median of 5.2 years in this dataset. Recursive partitioning of the derivation cohort indicated that the best single predictor of long-term mortality was history of congestive heart failure (CHF), followed by proximal left circumflex artery (LCx) lesion or patient's age older than 65 (Figure). This model identified patient groups with mortality ranging from 4.9% to 34.6%. Cox-regression modeling also showed that the presence of proximal LCx lesion was the best predictor of long-term mortality in patients with a history of CHF (OR 1.76 95%CI 1.06-5.31; p=0.003).

Conclusions: This decision tree model provides an accurate estimate of 5-year survival with simple clinical demographics and angiographic data.

ACC.ORAL CONTRIBUTIONS

817

Challenging Clinical Questions: Answers From Existing Databases

Monday, March 26, 2007, 2:00 p.m.-3:30 p.m.
Room 208-209-210

2:00 p.m.

817-3

High-Dose Atorvastatin - Better Value for Money: The Treating to New Targets Trial US Economic Substudy in 5,308 Stable Coronary Heart Disease Patients

Daniel B. Mark, J. David Knight, Patricia A. Cowper, Linda Davidson-Ray, Kevin J. Anstrom, Duke Clinical Research Institute, Durham, NC

Background: In the Treating to New Targets (TNT) trial, 80 mg/day atorvastatin produced a 22% relative risk reduction in the composite primary endpoint of coronary heart disease (CHD) death, nonfatal myocardial infarction, resuscitation from cardiac arrest, or stroke compared to 10 mg/day atorvastatin in stable CHD patients (p<0.001). In 1998, we initiated a prospective economic study of all US patients enrolled in TNT.

Methods: We collected hospital bills for 4,211 cardiovascular hospitalizations recorded over a median of 4.9 years follow-up. Department-level cost-to-charge ratios were used to convert charges to costs. Physician fees were assigned using the Medicare Fee schedule for all evident physician services. Atorvastatin costs were assigned based on observed days on therapy using a discounted Average Wholesale Price. Costs were discounted at 3% per year and expressed as 2004 \$US.

Results: Among the US patients, baseline characteristics were well balanced by treatment group. Major clinical outcomes in the US cohort were consistent with the overall clinical results of TNT. During follow-up, cardiovascular hospitalization was reduced (35% versus 41%, p<0.001) and revascularization was less frequent (16% versus 22%, p<0.001) in the high dose arm. Rates of noncardiovascular hospitalization were balanced in the two arms. At the end of 5 years, hospital plus physician cost was \$8,960, atorvastatin cost was \$3,167, and total cost was \$12,127 in the low dose arm (N=2,656). Hospital plus physician cost was \$7,598, atorvastatin cost was \$4,710, and total cost was \$12,308 in the high dose arm (N=2,652).

The net 5 year cost of the high dose arm was \$181. In 1,000 bootstrap samples, the high dose arm had a lower net cost in 39% of samples, while an additional 33% of samples had a cost difference <\$500. Hospital costs alone were lower in the high dose arm in 99% of bootstrap samples.

Conclusions: In the 5,308 US patients randomized into the TNT study, high dose atorvastatin provided significantly better clinical outcomes with almost no additional cost over 5 years by reducing the need for cardiovascular procedures and hospitalizations when compared to low dose atorvastatin.

817-4 The Cost Effectiveness of Functional Cardiac Testing in the Diagnosis and Management of Coronary Artery Disease: Principal Results from the CECaT Trial

Andrew M. Crean, Linda Sharples, Vikki Hughes, Matthew Dyer, Martin Buxton, Martin Buxton, Kim Goldsmith, David Stone, Papworth Hospital, Cambridge, United Kingdom

Background: A prospective randomised controlled trial in patients with stable chest pain to assess the:

- feasibility of functional cardiac tests as a gateway to angiography for diagnosis of IHD
- ability of diagnostic strategies including functional tests to identify patients who gain most from revascularisation.

• most cost-effective diagnostic strategy for patients with suspected coronary artery disease.

Methods: 898 patients investigated for stable chest pain were randomised to one of four initial tests : angiography (controls); SPECT MIBI; stress cardiac MRI; stress echocardiography.

Principal outcome measures were:

(a) Primary: exercise treadmill time at 18 months after randomisation; cost-effectiveness 18 months after randomisation compared with angiography.

(b) Secondary: exercise treadmill time at 6 months after treatment; Canadian Cardiovascular Society classification of angina; health-related quality of life; revascularisation rate; serious adverse events; clinician confidence in test results.

Results: 22% of MIBI patients, 20% MRI patients and 25% of stress echo patients were not subsequently referred for an angiogram. At 18 months, comparing SPECT MIBI and stress echo with angiography there was no clinically significant difference in total exercise time. The cardiac MRI group had significantly shorter mean total exercise time of 35 seconds. There was no significant difference among the groups in CCS class at either 6 or 18 month assessment. There was no significant difference in the number of patients reporting non-fatal events (1.59 (95%CI: 0.90, 2.79), $p=0.327$) between the groups. The mean (95% confidence interval) total additional costs over 18 months, compared with angiography, were £297 (-£200, £802) for SPECT MIBI, £362 (-£58, £921) for cardiac MRI and £899 (£294, £1,679) for stress echocardiography. Clinically important differences in health-related quality of life between functional test groups and controls could be ruled out.

Conclusions: Between 20% and 25% of patients can avoid invasive testing by the use of functional cardiac testing as a gateway to angiography, without substantial effects on outcomes.

2:30 p.m.

817-5 A School-based Health Education Program Identifies Children at Risk for Cardiovascular Disease and Diabetes: Baseline Data From The Project Healthy Schools 2005-06 Pilot Program

Lin Kimberly, Karen Goldberg, Timothy Cotts, Susan Aaronson, Gurm Roopa, Bruce Rogers, Eva Kline-Rogers, Kim A. Eagle, University of Michigan Medical Center, Ann Arbor, MI

Background: Overweight and obese status in children is becoming increasingly prevalent across the nation. Risk factors for atherosclerosis and glucose intolerance are now identified at a younger age. Project Healthy Schools (PHS) was launched in 2004-05 as a school-based multidisciplinary education program designed to promote healthy habits in middle school children. This community-university collaboration includes three middle schools in the college town of Ann Arbor, Michigan during the 2005-06 academic year. The aim of this study was to determine the incidence of atherosclerotic risk factors in sixth grade students.

Methods: Voluntary baseline screening of each sixth grade student included measurement of height, weight, body mass index (BMI), blood pressure, and a questionnaire about current health habits and knowledge. In addition, baseline laboratory tests including total cholesterol, LDL, HDL, triglyceride, and random glucose were obtained. Patients were considered "at-risk" if they had measurements greater than the 90th percentile for age, height, and weight in each category.

Results: Of 711 sixth grade students in three middle schools, 285 consented to study participation, of whom 223 consented to laboratory testing as well. Amongst study participants, mean age was 11.51 years old, and 133 (47.2%) were male. Risk factor analysis revealed the following information:

39 of 149 (26.2%) females and 51 of 131 (38.9%) males were overweight or obese by body mass index (BMI)

17 of 282 (6%) students had a systolic blood pressure (SBP) ≥ 124

100 of 222 (45%) students had a total cholesterol ≥ 170

9 of 203 (4.4%) students had a low density lipoprotein level (LDL) > 130

38 of 223 (17%) students had a high density lipoprotein level (HDL) < 45

10 of 221 (4.5%) students had a random glucose > 126 .

In total, 175 of 285 (61.4%) students were "at-risk" in at least one of the six major risk factor categories (BMI, SBP, total cholesterol, LDL, HDL, random glucose).

Conclusions: This study identifies a high proportion of sixth grade students in a mid-sized college town who are at risk for future atherosclerotic disease. The potential for environmental and behavioral change among middle school children is high.

817-6 Trends In Profile And Mortality Of Patients With Acute Myocardial Infarction From 1987 To 2002: A New Jersey Statewide Study.

Abel E. Moreyra, William J. Kostis, Stephen W. Marcella, Yu-Hsuan Shao, Alan C. Wilson, Kitaw Demissie, UMDNJ-Robert Wood Johnson Medical School, New Brunswick, NJ, UMDNJ-School of Public Health, Piscataway, NJ

Background: Over the last two decades, important changes in the management of acute myocardial infarction have occurred, however the impact on the association between changing patients' profile and mortality is not well known.

Methods: We studied all non-federal admissions for first acute myocardial infarction in New Jersey (N=231,164) over the 16-year period 1987-2002 and examined changes in demographics, comorbidities, complications, length of stay, use of invasive cardiac procedures, and outcomes by four-year subgroups.

Results: In the years under study, there was an increase in patient age (67.1 years in 1987-1990, 67.4 in 1991-1994, 68.3 in 1995-1998, and 69.4 in 1999-2002). The percentage of women with MI also increased (39.2, 39.6, 40.5, and 42.0%, respectively, $p<0.0001$). The percentages of patients with comorbidities increased: diabetes (23.7, 25.1, 26.4, 27.7%, $p<0.0001$), hypertension (36.5, 41.3, 47.7, 53.7%, $p<0.0001$), renal disease ($p<0.0001$), and cerebrovascular disease ($p=0.0002$). However, there was a decrease in the occurrence of mechanical (37.5, 34.3, 31.8, 31.6%) and electrical (44.0, 40.2, 36.9, 33.3%) complications ($p<0.0001$ for both). Length of hospital stay decreased from 11.7 to 10.5, 8.0, and 7.3 days ($p<0.0001$). The probability of having invasive cardiac procedures within 30 days of admission increased from 31.2 to 56.0% for CATH, 7.8 to 31.8% for PCI, and 6.2 to 13.6% for CABG ($p<0.0001$ for all). Time from admission to procedures decreased from 6.1 to 2.2 days for CATH, 6.1 to 1.3 days for PCI, and 8.7 to 3.9 days for CABG ($p<0.0001$ for all). Thirty-day mortality decreased from 15.3 to 12.3%, in-hospital mortality from 14.7 to 9.4%, same day mortality from 2.3 to 1.2%, and next day cumulative mortality from 4.7 to 2.9% ($p<0.0001$ for all).

Conclusions: Between 1987 and 2002, there was a steady increase in early revascularization procedures following hospital admission for first myocardial infarction and despite an increase in age and comorbidities, there was a significant decrease in both in-hospital and 30-day mortality.

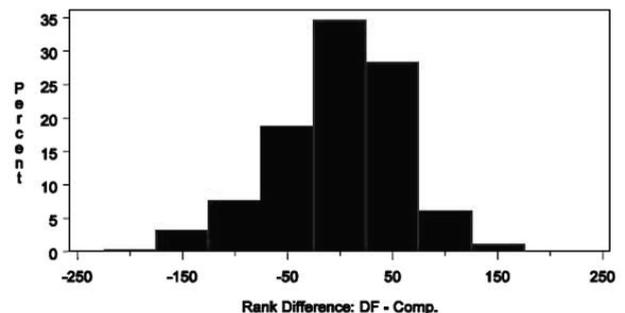
3:00 p.m.

817-7 What is the Best Measure for Rewarding Quality of Care: Defect-Free vs. Composite Scoring? An Analysis From the American Heart Association's Get With The Guidelines-Coronary Artery Disease (GWTG-CAD) Program?

Adrian F. Hernandez, Gregg C. Fonarow, Dadi Dai, Sean M. O'Brien, Kenneth A. LaBresh, Lee H. Schwamm, Christopher P. Cannon, GWTG Steering Committee and Hospitals., Duke Clinical Research Institute, Durham, NC

Background: Pay-for-Performance (P4P) rate centers based on combining multiple indicators into a score. Two methods are: i) the CMS opportunity-based composite method; and ii) the all-or-none (defect-free) method. It is unknown what method should be used for P4P programs.

Methods: Data were collected from GWTG-CAD hospitals for 5 performance measures at discharge: ASA use, BB use, ACEI/ARB use, smoking cessation counseling and lipid lowering medication. The CMS composite score is defined as the total number of instances across measures in which the hospital performed a required care process divided by the total number of instances in which care processes were required. Defect-free care was calculated as the percent of patients who received all 5 care processes. Hospitals were then ranked by each method and compared.



Results: There were 270,655 patients with CAD from 457 hospitals during 2000-2006. The mean CMS Composite Score was 79.3% with lowest 29.0% and highest 96.7%. The mean Defect Free Score was 55.0% with lowest 4.5% and highest 92.1%. The Defect-Free Score and CMS Composite Scores are highly correlated ($r=0.88$), but 41.8% of hospitals changed ranks by at least 1 decile and 11.4% by more than 2 deciles.

Conclusions: Methods for ranking hospitals in P4P may differ materially and financially. Further research is needed to determine the most appropriate method to reward high quality centers.

Figure: Distribution of rank differences between Defect Free Score (DF) and Composite Score (Comp) methodology.

817-8

Determinants of the Impact of Guideline Based Review on Utilization of Myocardial Stress Perfusion Imaging: Roles of Self-Referral, Physician Specialty, Patient Age and Type of Insurance.

Nathaniel Reichel, David Grossman, Russell Amico, Gary Gerstenblith, Jeffrey A. Brinker, Stephen Winters, Hugh Calkins, Jing Han, Joseph Levine, St. Francis Hospital, Roslyn, NY, Stony Brook University, Stony Brook, NY

Background: Rapid growth in outpatient radionuclide stress testing (MPI) volume has raised concerns regarding radiation exposure, cost and the potential role of self-referral in increasing utilization. We recently showed that guideline-driven precertification for MPI results in lower approval rates (-24.8%) and a drop in requests. To identify correlates of approval rates, we examined their relationship to physician specialty, self-referral, patient age, gender and insurance type.

Methods: A precertification algorithm (Care Core Cardiology Management), based on ACC/AHA/ASNC practice guidelines and appropriateness criteria was used from 2/03/06-4/30/06 in a population of 829,360 covered lives with commercial (95.1%, ages 20-90 yrs) or Medicare insurance(ages30-90 years) to evaluate 9,311 requests for MPI(16% Medicare).

Results: Most tests were requested by cardiologists (74%) who had higher approval rates (81.6%) than other physicians (70.7%, p<0.0001). Most cardiologist-requested tests were self-referred(59.5%). Self-referred tests were approved more often (81.4%) than other-referred tests (76.4%, p<0.001) but approval rates did not differ after adjustment for physician specialty. Approval rates were associated with patient age (odds ratio 1.7 per decade, 95% limits 1.62-1.79) and physician specialty, cardiologist vs. non-cardiologist (odds ratio 1.62, limits 1.45-1.80) and were higher for Medicare (90%) than for commercial insurance (76.5%, p<0.001) patients. After age adjustment, insurance type had no effect on approval rates. Self-referral rates did not differ for Medicare versus commercial insurance.

Conclusions: Using guideline-based algorithms for MPI, approval rates were higher for older patients and for tests requested by cardiologists. No independent effect of self-referral on guideline-driven approval rate adjusted for medical specialty was found. These results do not demonstrate adverse effects of self-referral and suggest that cardiologists have integrated guidelines and appropriateness criteria for MPI into practice more completely than have other physicians who order such testing.

ACC.ORAL CONTRIBUTIONS

826

New Insights From Outcomes Research: What You Need to Know

Monday, March 26, 2007, 4:00 p.m.-5:30 p.m.
Room 275-276-277

4:00 p.m.

826-3

Abciximab or Eptifibatide: Differences in outcomes of Patients Treated with Abciximab versus Eptifibatide as Adjunct Therapy for Primary Percutaneous Coronary Interventions for ST Elevation Myocardial Infarction.

Gurm Hinder, David Share, Dean E. Smith, Thomas LaLonde, Michael O'Donnell, Arthur Riba, Hameem Changezi, Marcel Zughab, Harish Chandra, Robert Safian, Mauro Moscucci, University of Michigan Medical Center, Ann Arbor, MI

Background: Pooled data from randomized controlled trials suggest that use of abciximab may be associated with a survival advantage in patients undergoing primary PCI. A large proportion of patients in the community are however treated with eptifibatide, an agent that shares some but not all pharmacological properties with abciximab. It is not clear if this therapeutic switch is associated with any deleterious impact on patient outcome.

Methods: We evaluated the outcome of 3237 patients with ST elevation MI that underwent primary PCI for acute ST elevation MI from October 2002 to March 2006 in a large regional consortium (BMC2), and who were treated with abciximab (n=671) or with eptifibatide (n=2566). We excluded patients treated after 12 hours of symptom onset, those transferred from another institution or those undergoing rescue PCI.

Results: Patients treated with abciximab were slightly older (59.7 vs. 53.2 yrs., p=0.01) and more likely to have angiographically evident thrombus (68.3% versus 57.3%, p<0.0001). There was no difference in other baseline demographic, clinical or angiographic variables. There was no difference in the incidence of in-hospital death (4.17% with abciximab versus 3.55 % with eptifibatide, P =0.44) or stroke/TIA (0.78% versus 0.75%, P = 0.92) while there was a trend towards decreased recurrent MI with abciximab (0.75% versus 1.75%, P = 0.059). There was no difference in the need for blood transfusion (12.37 % versus 11.26 %, P = 0.42) while there was a trend towards greater risk of GI bleeding with abciximab (4.47% versus 2.96, P = 0.051). In parsimonious risk adjusted models no significant difference between abciximab and eptifibatide was seen with respect to any of the outcome measures.

Conclusions: Currently, eptifibatide is used as the adjunct anti-platelet agent in majority of patients undergoing primary PCI. There is no apparent difference in early outcome of patients treated with eptifibatide compared to those treated with abciximab.

826-5

Gender Differences in Medical Care and In-Hospital Mortality After Acute Myocardial Infarction

Hani Jneid, Gregg Fonarow, Gray Ellrodt, Andrew O. Maree, George V. Moukarbel, Igor F. Palacios, Kenneth LaBresh, Li Lang, L. Kristin Newby, Gerald Fletcher, Eric Peterson, Chris P. Cannon, Laura Wexler, Massachusetts General Hospital and Harvard Medical School, Boston, MA

Background: Prior studies suggested that women receive suboptimal medical care after acute myocardial infarction (AMI) compared with men. Large efforts have been undertaken to improve AMI management. It is unclear whether these efforts have mitigated gender disparities in AMI care.

Methods: We examined gender differences in medical care and in-hospital mortality using a retrospective analysis of 78,254 AMI hospitalizations at 420 US hospitals participating in the Get With the Guidelines program between Jan 2001 and Apr 2006.

Gender disparities in recommended therapies, timing of treatments and in-hospital mortality

| OUTCOMES | OVERALL RATE (N) | MEN % (N) | WOMEN % (N) | Adjusted OR (Women vs. Men) | 95% Confidence Interval For Adjusted OR | Adjusted P-Value |
|---|------------------|----------------|----------------|-----------------------------|---|------------------|
| Early ASA (within 24h) | 92.4% (65,018) | 93.3% (40,332) | 91.0% (24,686) | 0.84 | 0.80-0.89 | < 0.0001 |
| Early Beta Blockers (within 24 h) | 86.2% (55,777) | 87.2% (34,653) | 84.7% (21,124) | 0.89 | 0.86-0.93 | <0.0001 |
| Cardiac Catheterization | 52.1% (40,745) | 56.2% (26,733) | 45.6% (14,012) | 0.91 | 0.87-0.94 | <0.0001 |
| Percutaneous Coronary Intervention | 45.9% (32,323) | 52.3% (22,253) | 36.1% (10,070) | 0.76 | 0.73-0.80 | <0.0001 |
| Fibrinolytic Therapy | 3.7% (2,634) | 4.4% (1,867) | 2.8% (767) | 0.81 | 0.75-0.87 | <0.0001 |
| Coronary Artery Bypass Graft | 7.7% (5,394) | 9.2% (3,893) | 5.4% (1,501) | 0.61 | 0.56-0.66 | <0.0001 |
| Revascularization | 52.6% (37,023) | 60.2% (25,614) | 40.9% (11,409) | 0.67 | 0.64-0.70 | <0.0001 |
| Exercise Stress Test | 1.5% (1,206) | 1.5% (728) | 1.6% (478) | 0.98 | 0.89-1.08 | 0.73 |
| Door-to-needle time within 30 min (in STEMI patients) | 33.2% (933) | 35.2% (711) | 28.3% (222) | 0.79 | 0.67-0.94 | 0.01 |
| Door-to-Balloon time within 90 min (in STEMI patients) | 43.2% (3,316) | 44.8% (2,510) | 39.0% (806) | 0.86 | 0.78-0.96 | 0.01 |
| Reperfusion (PCI or fibrinolytic therapy in STEMI patients) | 67.3% (17,058) | 73.0% (12,184) | 56.3% (4,879) | 0.74 | 0.69-0.79 | <0.0001 |
| Median Door-to-needle time (in STEMI patients) | 40 min | 39 min | 47 min | 1.14 | 1.05-1.23 | 0.001 |
| Median Door-to-Balloon time (in STEMI patients) | 97 min | 95 min | 103 min | 1.07 | 1.03-1.11 | 0.002 |
| In-Hospital Mortality | 6.7% (4,709) | 5.7% (2,412) | 8.3% (2,297) | 1.06 | 1.01-1.12 | 0.03 |

Results: Rates of use of recommended therapies and timing of treatments are shown in the Table. Compared with men, women were less likely to receive early aspirin and beta-blockers, and less likely to undergo cardiac catheterization, percutaneous coronary intervention, fibrinolytic therapy, coronary artery bypass graft surgery, or any revascularization. The percentage of patients with door-to-needle time <30 min and door-to-balloon time <90 min were also less in women. Women were more likely to die during the index hospitalization (8.2 vs. 5.7%, P <0.0001; adjusted OR, 1.06 (95% CI, 1.01-1.12). Results were similar among most age, body mass index and diabetes subgroups.

Conclusions: In our retrospective analysis, women hospitalized for AMI received less medical therapy and invasive procedures and experienced longer delays in acute reperfusion compared with men. This was associated with a small but statistically significant increase in in-hospital mortality among women.

4:45 p.m.

826-6

Poor Outcomes in Patients With Chronic Kidney Disease With and Without Reperfusion After Presentation with ST Elevation Infarction/Left Bundle Branch Block

Caroline Medj, Gilles Montalescot, Andrzej Budaj, Keith A. Fox, José López-Sendón, Gordon FitzGerald, David B. Brieger, Concord Hospital, Sydney, Australia, Center for Outcomes Research University of Massachusetts Medical School, Worcester, MA

Introduction Chronic kidney disease (CKD) is associated with aggressive vascular disease, higher event rates and poorer outcomes after an acute coronary syndrome. Relative benefit of reperfusion over conservative treatment with STE/LBBB in CKD is unclear.

Methods STE/LBBB patients (n=10,661) enrolled in GRACE were stratified by renal function and receipt of either fibrinolysis or primary PCI. Hospital mortality, adverse events, and 6-month mortality were compared. CKD was defined as glomerular filtration rate (GFR) <60 mL/min.

Results Hospital mortality increases significantly as renal function declines, across all treatment groups (p<.0001). There was no significant difference in hospital mortality in patients with CKD treated with vs without reperfusion (15 vs 19%, P=.07). Mortality rates with primary PCI or fibrinolysis were comparable (both 15%). Patients with normal renal function had a clear benefit associated with primary PCI vs fibrinolysis in the combined efficacy/safety endpoint (Table), an effect not observed in those with CKD. Reperfusion vs no reperfusion was associated with lower 6-month mortality in patients with GFR ≥30 but not <30.

| | N | GFR (mL/min) | | | P for interaction |
|---|--------|--------------|-------|-------------|-------------------|
| | | ≥60 | 30-59 | <30 | |
| Patients with STE/LBBB | | | | | |
| Hospital mortality | 10,661 | 7684 | 2573 | 404 | |
| - Primary PCI | 118 | 2% | 14% | 30% | |
| - Fibrinolysis | 205 | 3% | 13% | 30% | |
| - Reperfusion (primary PCI and fibrinolysis) | 323 | 3% | | 15%* | |
| - No reperfusion | 419 | 4% | 15% | 34% 19%* | |
| Death/myocardial infarction/stroke/major bleeding | | | | | |
| - Primary PCI | 282 | 8% | 25% | 38% | <0.001 |
| - Fibrinolysis | 629 | 16% | 27% | 38% | |
| - Reperfusion (primary PCI and fibrinolysis) | 911 | 12% | | 28%* | |
| - No reperfusion | 890 | 14% | 26% | 43% 29%* | |
| Six-month mortality | | | | | |
| - With in-hospital reperfusion (primary PCI) | | 2% | 4% | 25% | |
| - With in-hospital reperfusion (fibrinolysis) | | 2% | 5% | 20% | |
| - With in-hospital reperfusion- combined (primary PCI and fibrinolysis) | 122 | 2% | 5% | 22% 6%* | <0.001 |
| - Without reperfusion therapy | 223 | 4% | 13% | 15% | |

*(GFR 0-60ml/min)

Conclusions In STE/LBBB and CKD, mortality rates are high. In these patients reperfusion is associated with a non-statistically significant lower hospital mortality. In-hospital reperfusion is not associated with improved 6-month mortality when GFR<30.

5:00 p.m.

826-7

Potential Unintended Financial Consequences of Pay-For-Performance

Amrita Karve, Fang-Shu Ou, Barbara Lytle, Eric D. Peterson, Duke Clinical Research Institute, Durham, NC

Background: Medicare's pay-for-performance (PFP) pilot provides financial incentives (or penalties) to hospitals whose care rank in the highest (or lowest) quintile relative to peers. While PFP is intended to promote quality, centers serving large minority populations may disproportionately suffer financial hardship if their initial performance is below their peers.

Methods: Using publicly available PFP data, 2,785 US hospitals were ranked based on composite process metrics for acute myocardial infarction (AMI), community acquired pneumonia (CAP), and heart failure (HF). Centers with >20% African American (AA) patients were compared to those with <5% AA. Results were adjusted for hospital facility type, academic status, bed size, population density, and region.

Results: After adjustment, hospitals treating >20% AA patients (n=438) had slightly lower composite performance scores and lower likelihood for being a "top quintile performer" for AMI and CAP (p<0.001) versus centers treating <5% AA (n=1,156). Similarly high AA hospitals were significantly more likely to rank in the "bottom quintile" for AMI, CAP and HF (table).

Conclusions: Hospitals treating large AA populations will fair worse on PFP process performance assessment. Thus, PFP's financial impact may further exacerbate existing care disparities.

| | AMI | CAP | HF |
|--|---------------------|---------------------|---------------------|
| % Composite Score at sites with >20% AA pts | 88.50 | 75.00 | 69.67 |
| % Composite Score at sites with <5% AA pts | 90.40 | 79.53 | 70.28 |
| "Top Quintile Center" Adjusted OR* (95% CI) | 0.77 (0.76-0.78) | 0.37 (0.36-0.37) | 1.11 (1.09-1.12) |
| "Bottom Quintile Center" Adjusted OR* (95% CI) | 2.91 (2.87-2.96) | 3.19 (3.15-3.23) | 1.68 (1.65-1.71) |

*Hospitals with >20% AA patients relative to those <5% AA as reference

826-8

Do Core Measures and Other Evidence Based Practices Reduce Risk-Adjusted In-Hospital Mortality for Acute Myocardial Infarction in Community Practice?

Aaron D. Kugelmass, Phillip P. Brown, Allan Anderson, Lynn G. Tarkington, Rebecca Steed, Steve D. Culler, April W. Simon, Henry Ford Healthcare System, Detroit, MI, HCA CCMN, Nashville, TN

Background: Little is known about the impact of variation in CMS core measures and other evidence-based best practices on community hospital acute myocardial infarction (AMI) mortality.

Methods: A retrospective analysis was conducted using three HCA Databases: 1) Casemix, an administrative database of consecutive patients admitted to any HCA hospital; 2) Heart Service Standards Database, information collected from a web-based survey regarding structures and processes in place at each of 158 HCA hospitals, and 3) COMET, an clinical database containing core measures of care for AMI. The study population is 103 hospitals that perform PCI and treated more than 52 AMI patients during 2005 (32,263 patients). A logistic regression equation (controlling for 24 demographic characteristics and co-morbidities) was estimated to predict hospital mortality for each patient. Hospitals were divided into four tiers based on their average risk-adjusted mortality rate.

Results: The Table reports averages for all hospitals in each tier for selected measures. For example, the door-to-balloon (D2B) time averages 145 minutes for Tier I hospitals compared to 188 minutes for Tier IV hospitals. D2B time is significant for risk-adjusted mortality, with a Pearson correlation coefficient of 0.20, p=0.047.

Conclusions: This study finds shorter D2B times, higher acute PCI rates, and greater cardiologist coverage in typical top tier vs. bottom tier hospitals based on risk-adjusted mortality rate.

Selected Core Measures and Evidence Based Practices Across AMI Hospital Performance Tiers

| Hospital Tier | Risk Adjusted Mortality | Door to Balloon (D2B) Time | ASA on Arrival | Beta Blocker on Arrival | Acute PCI (Same Day) | Cardiologists Available 24/7 |
|---------------|-------------------------|----------------------------|----------------|-------------------------|----------------------|------------------------------|
| All | 7.2% | 157± 85 | 95.1% | 90.1% | 31.7% | 86.4% |
| I | 4.6% | 145± 55 | 95.3% | 89.8% | 31.9% | 92.0% |
| II | 6.3% | 142± 51 | 95.8% | 92.6% | 33.8% | 80.8% |
| III | 7.8% | 151± 62 | 94.3% | 87.9% | 32.4% | 84.6% |
| IV | 9.9% | 188± 137 | 94.9% | 90.2% | 28.8% | 88.5% |

ACC.POSTER SESSION

1030

Special Topics

Tuesday, March 27, 2007, 9:00 a.m.-12:30 p.m.
Hall H

9:00 a.m.

1030-146

Prognostic Significance of Dyspnea in Acute Coronary Syndromes

Ameeth Vedre, Jin Li, Hitinder Gurm, Kim Eagle, Eva Kline-Rogers, Umesh Tamhane, Vijay S. Ramanath, James B. Froehlich, University of Michigan Medical Center, Ann Arbor, MI

Background: The prognostic significance of dyspnea in patients with an Acute Coronary Syndrome (ACS) has not been studied.

Methods: A prospective cohort study was conducted on 1942 consecutive patients(pts.) admitted to University of Michigan between 1999 and 2002 with a discharge diagnosis of ACS. Patients were categorized based on their primary complaint at the time of admission. Group I (N=178) had primary symptoms of dyspnea only and no chest pain. Group II (N=1764) had no symptoms of dyspnea. In-Hospital and 6 month follow up data was collected.

Results: Patients with dyspnea were older and had more co-morbidities.They also had worse In-Hospital outcomes and post discharge survival.In a multivariable model dyspnea was however not an independent predictor of adverse outcomes.

Conclusions: Primary dyspnea is the chief complaint in about 10% of ACS pts. Dyspnea

is more common in certain patient subsets as shown in table 1. While dyspnea is a univariate predictor of poor outcomes, it is not an independent predictor of outcomes. Practitioners must be aware that dyspnea is not infrequently the primary complaint among pts with ACS, and is associated with greater co-morbidity.

9:00 a.m.

Table 1 Results

| | ACS Patients With Complaints of Dyspnea Only (N=178) | ACS Patients With No Complaints of Dyspnea (N=1764) | P-Value |
|--|--|---|---------|
| Baseline Characteristics | | | |
| Median Age (Years) | 72.1 | 63.5 | <.0001 |
| Prior CHF | 77 (43.3%) | 307 (17.4%) | <.0001 |
| Diagnosis | | | |
| ST-Elevation Myocardial Infarction((STEMI) | 29(16.3%) | 307(17.4%) | .006 |
| NSTEMI | 129 (72.5%) | 924 (52.4%) | <.0001 |
| Unstable Angina(USA) | 20(11.2%) | 533(30.2) | <.0001 |
| Diabetes | 68(38.2%) | 519(29.4%) | .001 |
| Clinical Presentation | | | |
| Pulse (bpm) | 92.4 +/- 31.1 | 79.5 +/- 22.0 | <.0001 |
| Serum Creatinine(mg/dl) | 1.6+/-1.76 | 1.26+/-0.99 | <.0001 |
| Killip I | 76 (42.7%) | 1461 (82.8%) | <.0001 |
| Killip II | 51 (28.7%) | 191 (10.8%) | <.0001 |
| Killip III | 40 (22.5%) | 49 (2.8%) | <.0001 |
| In-Hospital Outcomes | | | |
| Congestive Heart Failure(CHF) | 47 (26.4%) | 128 (7.3%) | <.0001 |
| Atrial Fibrillation | 33(18.5%) | 126(7.1%) | <.0001 |
| NSTEMI Pts.(With prior CAD) | 56(74.7%) | 348(48.2%) | <0.0002 |
| NSTEMI Pts.(Without prior CAD) | 73(70.9%) | 576(55.3%) | <.0001 |
| In-Hospital Outcomes | | | |
| Death | 19(10.7%) | 79(4.5%) | .003 |
| MACE(Major Adverse Cardiac Events) | 26(14.6%) | 105(6.0%) | <0.0001 |
| Hospital Management | | | |
| Beta Blockers<24hours | 87(67.4%) | 736(79.7%) | .0001 |
| Statins<24 hours | 43(33.3%) | 441(47.7%) | .0001 |

9:00 a.m.

1030-147 Impact of Payer Type on the Utilization of Drug-Eluting Stents for Patients With and Without Acute Myocardial Infarction

Kirsten Hall Long, Nilay D. Shah, Ritesh Banerjee, Douglas L. Wood, Charanjit S. Rihal, Henry H. Ting, Mayo Clinic College of Medicine, Rochester, MN

Background: Randomized trials have demonstrated improved outcomes with drug-eluting stents (DES) compared with bare-metal stents (BMS) for patients with and without acute myocardial infarction (AMI and non-AMI). While age, gender, and race have been reported to influence adoption of this technology, the impact of payer type is not known.

Methods: We identified all AMI and non-AMI patients undergoing percutaneous coronary intervention (PCI) with DES or BMS (2004 and 2005 inclusive) in a large nationally representative non-profit hospital database (Premier's Perspective Comparative Database). Patient, payer, and hospital characteristics were used in multivariate logistic modeling for AMI and non-AMI populations to assess the independent impact of payer type on the likelihood of DES use.

Results: A total of 73,341 AMI PCI and 162,582 non-AMI PCI patients were identified of whom 79% and 88%, respectively received a DES. In adjusted analyses, payer type was significantly associated with DES use as shown in the Table. Additionally being younger, female, white, and of lower estimated clinical severity was associated with an increased likelihood of receiving a DES.

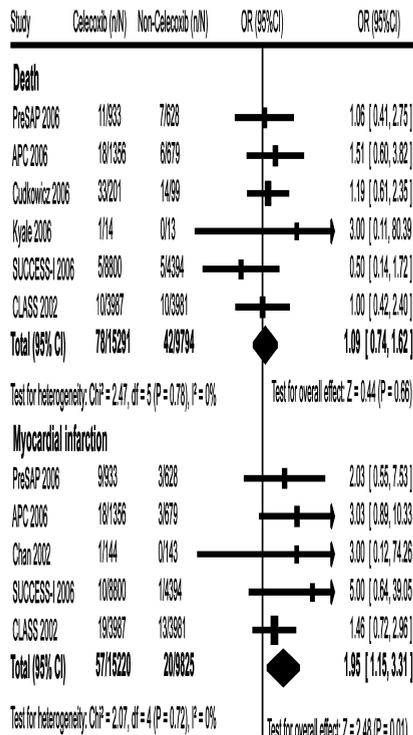
Conclusion: Payer type is associated with DES utilization and has a larger effect than age, gender, or race. The mechanisms of how commercial and managed care payers influence DES utilization will require further investigation and may include managing access and diverting patients to specific providers such as those with high procedural volume.

| | AMI Odds Ratio | 95% CI | Non-AMI Odds Ratio | 95% CI |
|-------------------|----------------|------------|--------------------|------------|
| Payer type | | | | |
| Medicaid | reference | | reference | |
| Medicare | 1.20 | 1.08, 1.33 | 1.14 | 1.01, 1.28 |
| Managed Care | 1.45 | 1.31, 1.60 | 1.37 | 1.21, 1.55 |
| Commercial | 1.34 | 1.18, 1.51 | 1.43 | 1.23, 1.65 |
| Age | | | | |
| ≥80 | reference | | reference | |
| 70-79 | 1.07 | 0.98, 1.16 | 1.15 | 1.08, 1.21 |
| 60-69 | 1.07 | 0.98, 1.17 | 1.18 | 1.11, 1.26 |
| <60 | 1.09 | 1.00, 1.19 | 1.22 | 1.14, 1.31 |
| Male | reference | | reference | |
| Female | 1.22 | 1.16, 1.29 | 1.19 | 1.14, 1.24 |
| Black | reference | | reference | |
| White | 1.13 | 1.05, 1.22 | 1.14 | 1.05, 1.23 |
| Low volume | reference | | reference | |
| High volume | 1.62 | 1.03, 2.53 | 1.65 | 1.06, 2.55 |

1030-148 Celecoxib Increases the Risk of Myocardial Infarction but Not of Death or Stroke: A Meta-Analysis of Randomized Controlled Trials

Rehan Qayyum, Kavitha Ramaswamy, Jurga Adomaityte, Kashif Chaudhry, Peter Danyi, Johns Hopkins University School of Medicine, Baltimore, MD

Background: Two cyclooxygenase-2 inhibitors (C2I) have recently been withdrawn from US market due to increased risk of cardiovascular (CV) events. Whether celecoxib, another C2I, has similarly increased CV risk is unknown. Clinical trials have not been sufficiently powered to evaluate the effect of celecoxib on CV events or mortality.



Methods: Therefore, we performed a meta-analysis of randomized controlled trials (RCT) that compared celecoxib with either placebo or other non-C2I, reported data on mortality, myocardial infarction, or stroke, and had at least 12 weeks of follow-up. We identified RCT by searching PubMed, EMBASE, and Cochrane Clinical Trials Register databases and by hand-search of the references of retrieved articles.

Results: Nine trials, including 27,366 patients, (median age = 59 years, range 49 to 67 years; median follow-up = 6 months, range 3 to 36 months) met inclusion criteria. There were 78 deaths in the celecoxib group versus 42 deaths in the non-celecoxib group (odds ratio [OR] = 1.09, 95% confidence interval [CI] = 0.74 to 1.62). There were significantly more myocardial infarctions in the celecoxib group as compared to non-celecoxib group (57 vs. 20, OR = 1.95, 95% CI = 1.15 to 3.31). On the other hand, the incidence of strokes was similar in celecoxib and non-celecoxib groups (OR = 0.92, 95% CI = 0.48 to 1.77).

Conclusions: Three months or longer treatment with celecoxib is associated with increased risk of myocardial infarction but not of mortality or stroke.

9:00 a.m.

1030-181 Economic Evaluation of Intensive Atorvastatin Compared to Standard Simvastatin in Patients With Acute Coronary Syndrome From the IDEAL Trial

Peter Lindgren, Bengt Jonsson, On behalf of the IDEAL trial investigators, European Health Economics, Stockholm, Sweden, Stockholm School of Economics, Stockholm, Sweden

Background: In the IDEAL trial, intensive atorvastatin 80mg (A80) versus simvastatin 20-40mg (S20-40); a subset analysis of patients randomized <2 months following an MI found A80 reduced major coronary events by 34% (p=0.02), non-fatal MI by 46% (p=0.04), and any cardiovascular event by 21% (p=0.02) compared to S20-40. The safety profiles of A80 and S20-40 were similar. An economic evaluation was performed on this population to assess the incremental cost-effectiveness of A80 compared with S20-40, accounting for generic S20-40 prices.

Methods: Costs were estimated for each arm by multiplying US cost estimates by resource consumption from the clinical trial, including study drug used, hospitalizations based upon adjudicated endpoint related diagnosis related groups, and lost work days for the duration of the study. Concomitant medications and adverse events requiring hospitalization were not included as they were similar in both arms. The measure of effectiveness was total number of events avoided. Breakeven analysis was performed on S20-40 prices as they impact cost effectiveness.

Results: Over a median 4.8 years, 1 in 5 CV events were prevented with A80 compared

with S20-40 (0.67 vs. 0.84 events/person). Based on current generic S20-40 pricing, total costs for treating patients with A80 were lower (\$30,723) than S20-40 (\$32,129). Total cost comprised the following for A80 vs. S20-40, respectively: drug costs (\$4,677 vs \$5,699), hospitalization costs (\$6,427 vs \$8,179), and cost due to lost productivity (\$19,620 vs \$18,251). If the US S20-40 cost fell 90% to \$0.36/day, the cost paid by the payer would be \$2,355 more for A80 over the study duration, resulting in an incremental cost per event avoided of \$14,145.

Conclusions: At current US prices, A80 is a cost-saving treatment vs. S20-40 in patients with recent MI and provides greater reduction in cardiovascular events. Even in a low cost generic market, A80 vs. S20-40 treatment in ACS patients is predicted to reduce CV events at an acceptable incremental cost, similar to that established in prior analyses of primary and secondary prevention studies where the comparator was no treatment.

9:00 a.m.

1030-182 Statin Under-Treatment and its Predictors: Results From a Large Community Survey

Ella Zomer, Alice Owen, Philippa Clarke, Kate Webb, Mendel Grobler, Danny Liew, NHMRC Centre for Clinical Research in Therapeutics, DEPM, Monash University, Melbourne, Australia, Pfizer Australia, Sydney, Australia

Background: HMG CoA reductase inhibitors ('statins') are widely prescribed for the primary and secondary prevention of cardiovascular disease. We sought to examine the proportions of patients taking statins who were being treated to target lipid levels according to recommended guidelines and their 'success' or otherwise in reaching targets.

Methods: A survey was undertaken of patients prescribed statins by 287 randomly-recruited primary care physicians from across Australia in late 2004. Anonymous data for 2414 patients taking statins were collected, including data on age, gender, comorbidities, details on statin prescription and lipid parameters at two time periods: before statin initiation and at least three months after. Clustering was minimized by accepting a maximum of ten patient survey forms from any one physician.

Results: Of the 2414 patients, physicians had set target lipid levels for only 1954 (66.0%). The targets were those recommended in either the Australian Lipid Management Guidelines (90%) or the National Cholesterol Education Program (NCEP) guidelines. Of the patients for whom target lipid levels had been set, only 11.2% reached the relevant targets. Among patients for whom no target lipid levels were set, only 4.1% attained lipid levels recommended by the Australian Lipid Management guidelines. In multivariate analyses, being elderly (age ≥ 65years), having existing coronary heart disease and having diabetes were independent predictors of who would reach target lipid levels. The respective odds ratios were: 0.61 (95%CI 0.42-0.88), 0.31 (95%CI 0.21-0.45) and 0.56 (95%CI 0.38-0.82).

Conclusions: A large proportion of patients being prescribed statins do not have recommended target lipid levels set by their physicians. Even for those who are, most are not being effectively treated to the recommended target levels. Being non-elderly, not having existing coronary heart disease and not being diabetic are independent risk factors for inadequate treatment. Even though statins are widely prescribed for the prevention of cardiovascular disease, the scope for further risk reduction remains large.

9:00 a.m.

1030-183 Effect of Payer Status on Interventional Utilization Patterns: Current Results From the NHLBI Dynamic Registry

William B. Borden, David P. Faxon, Faith Selzer, Kevin E. Kip, Warren K. Laskey, Elizabeth M. Holper, University of Chicago, Chicago, IL, University of Pittsburgh, Pittsburgh, PA

Background: Payer status has been demonstrated to influence rates of invasive cardiovascular procedures and revascularization in acute coronary syndrome (ACS). No study has examined whether utilization of resources within the catheterization laboratory varies with patients' insurance.

Methods: We evaluated 5,332 patients undergoing percutaneous coronary intervention (PCI) for an ACS in Waves 1-4 of the NHLBI Dynamic Registry. Baseline characteristics and usage of balloons, stents, and peri-procedural medications were compared for patients with the payer status of Medicare (n=2215), Public (n=568), and Private (n=2549).

Results: Medicare patients were significantly older, more commonly female, more commonly had prior revascularization, and had more non-cardiac comorbid disease (all p<0.0001). In an unadjusted model, patients with public insurance were less commonly on glycoprotein IIb/IIIa inhibitors and thienopyridines prior to the procedure, and were less likely to receive stents. Table 1 shows the adjusted odds ratio of device and medication use when compared to Medicare patients.

Conclusions: While payer status has been shown to influence choice of an invasive versus conservative strategy for ACS, once referred for PCI, insurance status does not affect the rate of stent usage. However, private patients received higher rates of IIb/IIIa inhibitors, a finding which requires further study.

Table 1:

| Device or Medication Use | OR | 95% CI | P-value |
|---------------------------|------|-----------|---------|
| Balloon Alone | 1.27 | 0.85-1.89 | 0.25 |
| Other public | 1.00 | 0.75-1.33 | 0.98 |
| Private | | | |
| Stent (any type) | 1.00 | 0.73-1.37 | 0.99 |
| Other public | 0.97 | 0.78-1.20 | 0.76 |
| Private | | | |
| Procedural thienopyridine | 0.85 | 0.65-1.11 | 0.24 |
| Other public | 0.96 | 0.80-1.15 | 0.65 |
| Private | | | |
| Procedural IIb/IIIa | 0.93 | 0.71-1.22 | 0.60 |
| Other public | 1.25 | 1.05-1.49 | 0.013 |
| Private | | | |
| Cypher stent† | 1.60 | 0.93-2.73 | 0.087 |
| Other public | 1.18 | 0.89-1.57 | 0.24 |
| Private | | | |
| Taxus stent† | 0.52 | 0.26-1.02 | 0.057 |
| Other public | 1.18 | 0.85-1.63 | 0.33 |
| Private | | | |

†Restricted to wave 4 (2004) (Medicare n=361, Other public n=69, Private n=440)

9:00 a.m.

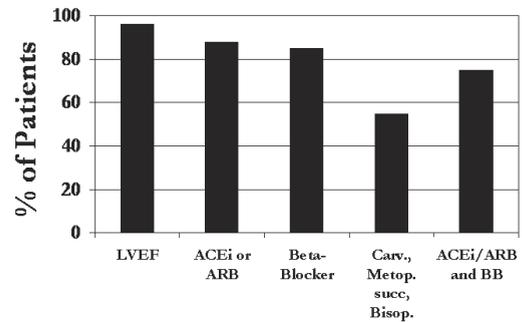
1030-184 Quality of VA Heart Failure Care, 2004-2005

Paul A. Heidenreich, Anju Sahay, Barry Massie, VA Palo Alto Health Care System, Palo Alto, CA

Background: Certain life-prolonging treatments and other processes of heart failure care are now considered performance measures. We sought to determine the current quality of VA HF care using ACC/AHA performance measures.

Methods: We used 2004-2005 data from the VA's national External Peer Review program that identified patients at all VA facilities with both an outpatient and an inpatient diagnosis of HF (N=11,326). Their charts were reviewed by trained abstractors to confirm the diagnosis of HF and determine treatment provided.

VA CHF Quality Measures 2004-2005



Results: The mean age of the 11,326 patients was 70 years. An LVEF measure was documented in 93% (10,545)-Figure. Of those with an ejection fraction below 40% and no documented contraindication, 88% (4909/5590) were treated with an angiotensin converting enzyme inhibitor (ACEi) or angiotensin receptor blocker (ARB) and 85% (4646/5497) were treated with a beta-blocker (BB). Of those treated with a BB, 2565 (55%) were treated with a BB known to prolong survival (carvedilol, metoprolol succinate or bisoprolol). Rates of education at discharge were 89% for weight, 96% for medication, and 98% for diet. From first quarter 2004 to last quarter 2005 BB use increased (83% vs 88%) while ACEi/ARB use decreased (94% vs 85%, p for trend < 0.001 for both).

Conclusion: Heart failure care within the VA is higher than historical data for other U.S. systems for many performance measures. However only half of VA heart failure patients are treated with beta-blockers known to prolong survival.

9:00 a.m.

1030-185 Differences in Medical Care in Patients Presenting with Acute Myocardial Infarction During Holidays and Weekends vs. Weekdays

Hani Jneid, Gregg Fonarow, Andrew O. Maree, Kenneth LaBresh, Li Lang, Roberto Bolli, L. Kristin Newby, Gerald Fletcher, Igor F. Palacios, Laura Wexler, Eric Peterson, Massachusetts General Hospital and Harvard Medical School, Boston, MA

Background: Few studies have examined the relationship between the time of admission and medical care in patients with acute myocardial infarction (AMI). It is unclear whether the improvement in AMI management has mitigated the disparities in care with respect to the time of admission.

Methods: We studied the impact of admission during weekends and holidays (vs. weekdays) on medical care in 62,814 AMI patients who presented to 379 US hospitals

participating in the "Get With The Guideline" program between July 2000 and September 2005. We compared therapies between groups, first without adjustment, then with adjustment for demographic and medical characteristics by multiple logistic regression.

Results: Compared with admission on weekdays, patients presenting on weekends and holidays were more likely to receive early aspirin, early beta blocker and fibrinolytic therapy but less likely to undergo revascularization. In patients with ST-segment elevation MI, admission on weekends and holidays was associated with longer door-to-balloon time and lesser likelihood to achieve door-to-balloon time < 90 min. No differences in hospital mortality with respect to admission time was observed. Rates of use of recommended therapies and timing of treatments are shown in the Table.

Conclusions: Patients presenting with AMI on weekends and holidays were more likely to receive acute medical therapy but less likely to undergo timely invasive therapy. This was not associated with differences in hospital mortality.

| Outcomes | Overall rate % (N) | Weekends/Holidays % (N) | Weekdays % (N) | Unadjusted P-value | Adjusted OR (weekends/holidays vs. weekdays) | 95% Confidence Interval for adjusted OR | Adjusted P-value |
|---|--------------------|-------------------------|-----------------|--------------------|--|---|------------------|
| Early ASA (within 24 h) | 91.3 % (51,562) | 91.7 % (17,776) | 91.1 % (33,786) | 0.01 | 1.08 | 1.03-1.14 | 0.003 |
| Early Beta Blockers (within 24 h) | 84.4 % (44,162) | 85.0 % (15,233) | 84.0 % (28,929) | 0.003 | 1.07 | 1.02-1.12 | 0.003 |
| Percutaneous Coronary Intervention | 42.5 % (25,682) | 41.8 % (8,629) | 42.9 % (17,053) | 0.01 | 0.97 | 0.93-1.00 | 0.054 |
| Fibrinolytic Therapy | 5.4 % (3,240) | 6.2 % (1,284) | 4.9 % (1,956) | <0.0001 | 1.23 | 1.15-1.31 | <0.0001 |
| Coronary Artery Bypass Graft | 7.4% (4,493) | 6.9% (1,426) | 7.7% (3,067) | 0.0003 | 0.87 | 0.80-0.95 | 0.001 |
| Revascularization | 49.0% (29,590) | 47.7% (9,845) | 49.7% (19,745) | <0.0001 | 0.93 | 0.90-0.96 | <0.0001 |
| Door-to-needle time within 30 min (in the STEMI subgroup only) | 34.1 % (756) | 33.6 % (315) | 34.5 % (441) | 0.67 | 0.96 | 0.78-1.18 | 0.72 |
| Door-to-Balloon time within 90 min (in the STEMI subgroup only) | 41.8 % (2,281) | 31.3 % (583) | 47.3 % (1,698) | <0.0001 | 0.47 | 0.40-0.54 | < 0.0001 |
| Median Door-to-needle time (in the STEMI subgroup only) | 40 min (2,216) | 40 min (937) | 40 min (1,279) | 0.77 | 1.03 | 0.92-1.14 | 0.62 |
| Median Door-to-Balloon time (in the STEMI subgroup only) | 99 min (5,454) | 108 min (1,862) | 93 min (3,592) | <0.0001 | 1.16 | 1.11-1.21 | <0.0001 |
| In-Hospital Mortality | 7.2 % (4,035) | 7.1 % (1,365) | 7.2 % (2,670) | 0.9 | 0.98 | 0.91-1.05 | 0.59 |

9:00 a.m.

1030-186 Variation in CABG and PCI Outcomes Across Four Revascularization Centers in Northern New England and its Relation to Community Survival

Mirle A. Kellet, Jr., Thomas J. Ryan, Jr., F. Lee Lucas, Andrea Siewers, Todd A. MacKenzie, David J. Malenka, Maine Medical Center, Portland, ME, The Northern New England Cardiovascular Disease Study Group, Lebanon, NH

Background: Three year survival after revascularization therapy (RT) should be optimized when patients are referred to the procedure with best predicted survival and it is performed optimally. We have studied the variation in referral decision and here we examine the variation in CABG and PCI outcomes across 4 centers in the Northern New England (NNE) and its relation to community RT survival.

Methods: From our NNE PCI and CABG relational database with NDI-derived vital statistics we identified 14,239 consecutive patients undergoing a first revascularization procedure (CABG 10,395 PCI 3844) for 2 and 3 vessel disease with procedures performed between 1996-2001 at 4 NNE centers. We developed prediction rules for in-hospital and 3 year mortality for CABG and PCI. We compared center specific Observed/Expected (O/E) performance for CABG, PCI, and RT.

Results: Three year survival was 90.6% and risk adjusted survival was not different across centers. However the relative frequency of CABG v. PCI and the outcomes vary across centers. The O/E ratios for CABG, PCI and RT are presented in the table below.

Conclusions: Risk adjusted outcomes for RT across four NNE centers are similar despite significant variation in the use of CABG v PCI by center. The risk adjusted outcomes for PCI and CABG vary significantly across centers. A heart center needs to understand

variation in selection of RT strategy and site specific outcomes to optimize the long-term survival of their patients referred for multi-vessel revascularization.

Three-year O/E Ratios by Center and Procedure

| Site | CABG Deaths | | PCI deaths | | RT Deaths | |
|----------------------|-------------|------|------------|------|-----------|------|
| | O/E | % | O/E | % | O/E | % |
| Site (CABG/PCI) | | | | | | |
| All (10,395/3,844) | | | | | | |
| Site 1 (2,311/959) | 191/192 | 0.99 | 98/90 | 1.09 | 289/280 | 1.03 |
| Site 2 (1,759/407) | 139/165 | 0.84 | 57/40 | 1.42 | 196/208 | 0.94 |
| Site 3 (4,098/1,271) | 396/367 | 1.08 | 108/130 | 0.83 | 504/497 | 1.01 |
| Site 4 (2,220/1,066) | 218/219 | 0.99 | 120/123 | 0.98 | 338/342 | 0.99 |

9:00 a.m.

1030-187 Value of Common Preoperative Risk Indices After Hip Surgery

Jeanne M. Huddleston, Dirk Larson, L. Joseph Melton, III, Rachel Gullerud, Sherine E. Gabriel, Veronique L. Roger, Mayo Clinic, Rochester, MN

Background: The ACC/AHA guideline for CV risk stratification in noncardiac surgery references studies using pooled surgery data. It is unknown if rates of myocardial infarction (MI) or death differ by types of hip surgery (elective replacement vs fracture repair). Further, the value of CV risk assessment tools to predict postoperative MI or death after hip surgery is unknown.

Methods: All 1609 Olmsted County, MN, residents hospitalized for hip surgery from 1988 to end 2002 were evaluated for MI and death to 1 year postoperatively. Data on preoperative morbidity and components of 3 preoperative risk indices were obtained from complete (in- and outpatient) community medical records.

Results: The risk of MI or death after hip fracture repair was 34% (95% CI 31, 38) vs 8% (95% CI 6, 10) for elective replacement. Controlling for sex, age and ASA score, the relative risk of MI and death in fracture repair vs elective replacement was 3.6 (95% CI 2.5, 5.2). For fracture repair, the Revised Lee index was significantly associated with an increased risk of MI or death with each incremental increase in the index score. ASA score provided similar incremental information in elective replacement. The concordances from logistic regression models are tabulated.

| | Hip fracture repair | Hip replacement |
|------------------------|---------------------|-----------------|
| Revised Lee Index | 0.62 | 0.65 |
| ASA score | 0.60 | 0.71 |
| ACC/AHA classification | 0.60 | 0.63 |

Conclusion: Hip fracture repair has a greater risk of postoperative MI/death than elective replacement. In fracture patients the Revised Lee Index adds valuable information for risk stratification, but none of these commonly used risk indices ideally predict MI and death.

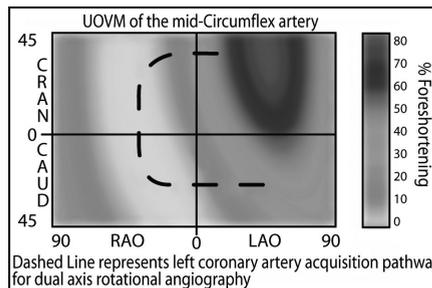
9:00 a.m.

1030-188 Determination of Optimal Viewing Angles for X-ray Coronary Angiography Based on a Quantitative Analysis of 3D Reconstructed Models

Andrew J. Klein, Joel A. Garcia, Babak Movassaghi, Onno Wink, S.-Y. James Chen, John C. Messenger, Adam Hansgen, Nathan E. Green, John D. Carroll, University of Colorado Health Sciences, Denver, CO, Philips Medical Systems, Bothell, WA

Background: Coronary angiography uses expert-recommended viewing angles which are limited by patient variability in vessel foreshortening and overlap. Via three dimensional (3-D) coronary modeling, we propose that a scientifically designed, population-based universal optimal view map (UOVM) may be generated which minimizes these shortcomings. This UOVM would provide quantitatively valid viewing angles for all first and second order coronary arterial segments.

Methods: We analyzed 137 angiograms and created 3-D models of each coronary tree which allowed quantitative assessment of vessel foreshortening and generation of patient-specific optimal view maps. From this data, a UOVM (see figure) was generated. This permitted a quantitative comparison between traditional (non-scientific based) and UOVM-derived viewing angles.



Special Topics

9:00 a.m.

Results: In all major vessel segments, the traditional viewing angles provided 17% vessel foreshortening and 13% overlap, while the UOVM provided 5.6% foreshortening and 6.4% overlap, a 60% reduction in foreshortening ($P < .05$) and a 31% reduction ($p = NS$) in overlap. **Conclusions:** 1) This study demonstrates an innovative and scientifically-based method of obtaining optimal view angles 2) UOVM use decreases vessel foreshortening and overlap, i.e. facilitating the acquisition of better images with less contrast and radiation. 3) The UOVM permits the design of single injection trajectories for each coronary tree using dual-axis rotational angiography (see figure).

9:00 a.m.

1030-189 Hematological and Biochemical Variables Strongly Predict Death at 1-Year After Percutaneous Coronary Intervention (PCI)

Khan Pohllel, Sasidhar Guthikonda, Viola Vaccarino, Emir Veledar, Abdul Sheikh, Ziyad B. Ghazzal, Emory University School of Medicine, Atlanta, GA

Background: Many clinical characteristics are well-established prognostic indicators at the time of PCI, but the combined prognostic value of hematological and biochemical laboratory data is less clear. We sought to use these test results to develop a risk model to predict 1-year mortality after PCI.

Methods: We performed an analysis of 1701 patients with complete laboratory data and one year follow-up who underwent PCI at the Emory University Hospital from 2001 to 2004. We used logistic regression analysis to predict 1-year death with the following candidate variables: demographic and medical history factors, ejection fraction, angina class, HDL cholesterol(HDL-C), white blood cell count (WBC), glomerular filtration rates (GFR), creatinine, hemoglobin (Hg) and troponin I.

Results: There were 69 deaths at 1-year follow-up. The following variables were associated with the highest risk of death in the final model: hemoglobin, WBC, HDL-C, GFR and age. A nomogram based on the regression coefficient of these variables was created and a composite score for risk of death was calculated, showing a steep increased probability of death with an increasing risk score (Table 1). The c statistic of the model was 0.764.

| Variables | Points | Composite Risk Score (from 5 criteria) | Probability of Death at 1 year following PCI |
|----------------------------------|----------------------|--|--|
| Age (Years) | 40 | 0 | 0.005 |
| | 50 | 20 | 0.010 |
| | 60 | 40 | 0.020 |
| | 70 | 60 | 0.040 |
| | 80 | 80 | 0.060 |
| HDL-C (mg/dL) | 10-34 | 55 | 0.100 |
| | 35-40 | 13 | 0.150 |
| | quartiles 41-47 | 19 | 0.200 |
| | >47 | 0 | 0.250 |
| | WBC ($10^3/\mu L$) | 2.1-6.0 | 20 |
| quartiles | 6.1-7.2 | 0 | 0.350 |
| | 7.3-8.3 | 40 | 0.400 |
| | >8.3 | 65 | 0.450 |
| Hg (gm/dL) | <11.5 | 74 | 0.500 |
| | 11.5-15.5 | 44 | 0.550 |
| | >15.5 | 0 | 0.600 |
| GFR (mL/min/1.73m ²) | <30 | 70 | |
| | 31-60 | 25 | |
| | >61 | 0 | |

Table 1. Nomogram to predict death.

Conclusions: Hematologic and biochemical variables strongly predict death at one year following PCI. We propose a risk score based on levels of hemoglobin, HDL-C, WBC count, GFR and age that is more predictive of 1-year mortality than traditional clinical variables.

1030-190

Simulation-based Crisis Resource Management Program In a Pediatric Cardiac Intensive Care Unit Improves Participants Self-Perception of Resuscitation Skills

Catherine K. Allan, Dorothy M. Beke, Liana J. Kappus, Peter C. Laussen, Ravi R. Thiagarajan, Children's Hospital Boston, Boston, MA

Background: Medical Simulation is an important training tool in critical care settings. In our pediatric cardiac ICU (CICU), resuscitation events are frequent, complex, and specific treatment modalities often fall outside the scope of PALS guidelines. We have developed a crisis resource management (CRM) training program tailored specifically to our clinical setting to teach specific resuscitation and teamwork skills.

Methods: We developed a CRM curriculum utilizing specific scenarios encountered in our CICU. Training in the CICU utilizes a high fidelity simulated patient (SimMan, Laerdal, Inc.) along with airway and resuscitation equipment, including an ECMO circuit. Participants (nurses, fellows, and staff physicians) replicate the composition of a clinical team during a true resuscitation event. Each scenario is videotaped, and extensive debriefing follows, focusing on technical aspects of resuscitation and CRM principles such as communication, leadership, and team organization. Participants complete pre- and post-participation questionnaires about the program and their level of comfort participating in resuscitation events.

Results: 70 clinicians participated in our CRM program in 2005 (50 nurses, 17 fellows, 3 staff physicians). Participants had a median of 9 years (1 - 43) of clinical experience. Analysis of questionnaires showed all participants scored the usefulness of the program and specific scenarios as ≥ 4 on a Likert scale of 1 (least) to 5 (most useful). There was significant improvement in participant's perceived ability to function as a member of a code team and confidence in participating in a code following CRM training ($p < .001$). Participants were significantly more likely to raise concerns about inappropriate management to the code leader following CRM training ($p < .001$).

Conclusions: We developed a CRM training program in a pediatric CICU to teach technical resuscitation skills and improve team function. Participants found the experience useful and reported improved ability to function in a code situation. Further work is needed to determine whether participation in the CRM program objectively improves code team function during real resuscitation events.

9:00 a.m.

1030-191

Paging The Worldwide Cardiology Consultant: The Army Knowledge Online Telemedicine Consultation Program In Cardiology

Elden R. Rand, Joseph C. Lee, Charles M. Lappan, James L. Furgerson, Brooke Army Medical Center, Fort Sam Houston, TX

Background: Global operations place large numbers of servicemembers and older civilian contractors in austere environments. They often require medical evacuation for common cardiovascular issues at great expense and effort. The Army Knowledge Online (AKO) Telemedicine Consultation Program was initiated by the Office of the Surgeon General to electronically link deployed medical providers with subspecialty consultants via the internet to assist and guide with downrange triage and disposition.

Methods: Receipt of a consultation on the global network triggered a text page to an on-call staff cardiologist at Brooke Army Medical Center, Texas, who would then retrieve and evaluate the consultation. The primary means of communication was email, however the option for phone consultation was also available. All consultations from project inception in September 2005 through August 2006 were reviewed and analyzed for efficacy by consult question, final diagnosis, recommendations, and number of aeromedical evacuations.

Results: A total of 62 cardiology teleconsults were managed. Patient types included military (United States and coalition), civilian contractors, foreign citizens, detainees, and earthquake refugees. Consultations were received from multiple countries in southwest Asia to southeast Asia and the Pacific rim. The average response time for cardiology teleconsultation since inception is 3 hours 37 minutes. The three most prevalent reasons for cardiology teleconsultation are electrocardiographic abnormalities, chest pain syndromes, and syncope. Avoidance of 3 aeromedical evacuations was accomplished, and facilitation of 9 aeromedical evacuations was aided. Given an estimated cost of \$24,000 per medical evacuation, an estimated \$72,000 was saved plus intangible benefits to multiple patients regarding management and disposition to appropriate facility of care.

Conclusions: Cardiology consultation via the internet provides a valuable service to deployed providers around the world, decreases medical evacuation costs, and facilitates transfer of patients to appropriate facilities for care.