Abstracts

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Cosponsored by the Councils on Cardiovascular Nursing, Clinical Cardiology, and Stroke

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Increasingly there is interest in efforts to assess and improve clinical and health care delivery performance. This has been the focus of the Forum on Quality of Care and Outcomes Research. The meeting is held annually in Washington, DC and includes workshops, plenary sessions, concurrent sessions, and both oral and poster abstract presentations. This year, abstracts were accepted from more than 15 countries covering broad topics in outcomes research.
Quality-of-Life and Economic Outcomes in the Clinical Outcomes Utilizing Percutaneous Coronary Revascularization and Aggressive Guideline-Driven Drug Evaluation (COURAGE) Trial

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Background: The utility and cost effectiveness (CE) of percutaneous coronary intervention (PCI) in patients with moderate to severe non-coronary acute coronary disease (CAD) receiving optimal medical therapy (OMT) has been prospectively evaluated in COURAGE in comparison to those receiving OMT alone. Methods: 2,267 patients were randomized to PCI plus OMT vs OMT alone. The primary endpoint is death or MI at 4.5 years. The principal secondary endpoint is quality of life (QOL) measured with the Seattle Angina Questionnaire (SAQ) at baseline, 1, 3, 6, and 5 years; 85% men and 86% Caucasian. Mean age was 58.5 years, p < 0.05), and rheumatic disease (14.4% vs 35.3%, p < 0.05) were more likely to receive lipid testing (adjusted OR = 0.76), and were more likely to have ischemic stroke (IS), females were 17% more likely than males to have an unfavorable outcome at all possible dichotomizations. A higher proportion of females received rt-PA (16.2% vs. 29.3%, adjusted OR = 0.34, 95%CI = 0.34 – 0.86). In-hospital mortality was similar in women and men (9% vs. 8%), however, women had poorer outcomes on the MRS (OR = 1.17, 95% CI = 1.01 – 1.35) indicating that females were 17% more likely than males to have an unfavorable outcome at all possible dichotomizations. toasted compared and as mean and bootstrap analysis to assess distribution. Survival beyond the trial was assessed from external databases. Utility measures were combined with survival to calculate QALYs. The incremental CE ratio (ICER) of PCI is the added cost divided by QALYs gained. The distribution of the ICER was calculated by dual bootstrap of cost and QALY differences. The % of PCI dominant and dominated was calculated. Results: At baseline, women were matched well, mean age 62.5 ± 5 years; 85% men and 86% Caucasian. Mean duration of angina 26 months (average 10 episodes/week), 29% current smokers, 67% hypertension, 55% prior MI, 71% dyslipidemia, 34% diabetes, 27% prior revascularization, and 69% multi-vessel CAD, in aggregate indicating significant co-morbidity. From the SAQ baseline angina frequency score was 68 ± 26; quality of life 51 ± 25. From the Rand physical functioning score 58 ± 27; mental health 71 ± 20. QOL, resource utilization, cost and CE by treatment group in follow-up will be presented. Conclusions: The COURAGE QOL and CE outcomes compliment and broaden the primary clinical endpoint.

Differences in Mitral Valve Disease Presentation and Surgical Treatment Outcome Between Hispanic and Non-Hispanic Patients

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Background: This study analyzed the differences in clinical presentation, etiology, and hospital outcome between Hispanic and non-Hispanic patients presenting with primary causes of mitral valve disease at a large urban medical center. Methods: All adult patients undergoing isolated mitral valvuloplasty (MVP) or mitral valve replacement (MVR) surgery at two hospitals between 1993 and 2003 were studied. Patients were grouped according to ethnicity as reported to the New York State Cardiac Surgery Reporting System. Preoperative variables compared included age, congestive heart failure (CHF), etiology, and pertinent medical and operative risk. Results: In-hospital mortality was 2.8% (233/8462) in African Americans. Racial disparity in mortality was larger in the very-low volume category than in the remaining categories. After controlling for potential confounders, adjusted odds ratios of in-hospital mortality with increasing volume categories (very-low-volume hospitals as reference) were 0.85, 0.79, and 0.91 among whites and 0.39, 0.58, and 0.53 among African Americans. (P = 0.007 for interaction between volume and race) When examined by operative risk, the benefit of high-volume hospitals tended to decrease with increasing risk, but it was not statistically significant. Conclusions: Racial disparity in the volume-mortality relationship was not significantly different across low-, intermediate-, and high-risk patients. Conclusion: African American patients have greater reduction in in-hospital mortality than whites by undergoing CABG at high-volume hospitals, even after adjusting for operative risk. Future research should focus on why very-low-volume hospitals have excessive mortality in African American patients.

Sex Differences in Acute Stroke Care and Outcomes: Results From a Statewide Stroke Registry

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Background and Purpose: Many studies have reported poorer stroke outcomes in women, and some studies have reported sex differences in care. We analyzed data from a hospital-based stroke registry to determine whether acute stroke care and in-hospital outcomes differed by sex. Methods: Detailed chart-level information was collected on 2,586 subjects admitted with acute stroke or TIA to 15 Michigan hospitals in 2002. Sex differences in stroke care, and patient outcomes (in-hospital mortality and Modified Rankin Scale (MRS) at discharge) were assessed after adjusting for differences in demographic, clinical characteristics, and comorbidities using multivariable models. MRS data were analyzed using proportional odds models. Results: Females were older than males (70 vs 67 years, and were more likely to have congestive heart failure and hypertension. Males were more likely to smoke and have a history of heart disease and dyslipidemia. Overall, relatively few gender differences in in-hospital procedures or treatments were found after multivariable adjustment: women were significantly less likely to receive lipid testing (adjusted OR = 0.76), and were more likely to suffer urinary tract infections (adjusted OR = 2.57). Among 634 and 750 female and male subjects with ischemic stroke (IS), females were less likely than males to receive rt-PA (2.4% vs. 4.4%, adjusted OR = 0.24, 95% CI = 0.76 – 0.86). Likewise, among 99 males and 81 females with IS who arrived < 2 hours after symptom onset and had no contraindications, a lower percentage of females received rt-PA (16.2% vs. 29.3%, adjusted OR = 0.34, 95%CI = 0.34 – 0.86). In-hospital mortality was similar in women and men (9% vs. 8%), however, women had poorer outcomes on the MRS (OR = 1.17, 95% CI = 1.01 – 1.35) indicating that females were 17% more likely than males to have an unfavorable outcome at all possible dichotomizations. Conclusion: While considerably parity exists in many aspects of acute stroke care, women were less likely than men to receive thrombolytic treatment and lipid testing even after adjusting for age and other differences. However, given the largely similar care observed, it is unlikely that these differences explain the poorer functional outcomes of female stroke survivors.

Smoking Cessation is Associated With Better Mental Health Outcomes After Myocardial Infarction

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Background: Although it is established that smoking cessation is associated with reduced mortality among patients with coronary heart disease, the impact of smoking cessation on patients’ health status following myocardial infarction (MI) has not been definitively defined. We examined the association of smoking habits with symptoms and health status, as measured by the Seattle Angina Questionnaire (SAQ) and the Short Form-12 (SF-12), at 1.6, and 12 months following MI in 1144 patients enrolled in the 19-center PREMIER study between 1/03 and 6/04. Patients who did not smoke at the time of their MI were grouped in those who quit (n = 504) and 6/04. Patients who did not smoke at the time of their MI (n = 504) were compared to those who quit (n = 225) and those who continued smoking (n = 415). Quitters were defined as those who quit at baseline but not at 6 and 12 months post-MI. The independent association of smoking status with 12 month outcomes was identified after adjusting for 16 demographic, clinical, and sociodemographic factors that differed by smoking status, as well as baseline health status. Results: In multivariable analysis, patients who quit smoking by 6 months had greater improvement in SF-12 mental component scale (MCS) scores by 12 months after discharge when compared to those who continued to smoke (2.67 points; 95% CI 1.12, 4.23; p = 0.007), with further significant improvement in mental health for quitters occurring between 6 and 12 months (1.81 points; 95% CI 0.47, 3.16; p = 0.008). Figure, No
Analysis of Door-to-Balloon Time Line to Identify Where Delays Occurred in ST-Elevation Myocardial Infarction Patients Who Presented After Versus During Regular Working Hours

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Background: The benefits of reperfusion in ST-elevation myocardial infarction (STEMI) are time-dependent. We examined door to balloon times (DTBT) and the different timeline intervals for STEMI patients who presented to the emergency department (ED) after versus during regular working hours (RWH). Methods: Eighty-four and ninety-three consecutive patients with STEMI who were treated with primary percutaneous coronary intervention (PCI) between January 2002 and August 2006 at a single US hospital were studied. The following time intervals were recorded for each patient: (I) Door to balloon (II) Door to first EKG (III) EKG to Decision for PCI (IV) Decision for PCI to leaving ED and (V) Leaving ED to balloon. Chi-square and independent t-test were used for statistical analysis. Results: Sixty seven percent of patients were males. Mean DTBT was 85 minutes and mean age was 60.5 years. Patients who presented during RWH had significantly shorter DTBT (78.4 vs. 92.2 minutes; p < 0.001) when compared to patients who presented after RWH. Door to EKG time was not significantly different between the two groups (8.49 vs. 8.35 minutes; p = 0.053). All other time intervals were significantly shorter for patients who arrived during RWH. (See Table 1). Conclusions: Even when the institution’s DTBT is below 90 minutes, patients with STEMI who presented after RWH had longer delays in time to decision and definitive treatment (PCI). These areas warrant further investigation in order to improve DTBT in all patients regardless of time of arrival.

Table 1: Time Intervals (minutes) During Regular Working Hours After Regular Working Hours P Value

<table>
<thead>
<tr>
<th>Time intervals (minutes)</th>
<th>During Regular Working Hours</th>
<th>After Regular Working Hours</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>I: Door To Balloon</td>
<td>78.4</td>
<td>92.2</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>II: Door To EKG</td>
<td>9.49</td>
<td>8.36</td>
<td>0.053</td>
</tr>
<tr>
<td>III: EKG To Decision</td>
<td>16.2</td>
<td>20.3</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>IV: Decision to Leaving ED</td>
<td>10.4</td>
<td>15.1</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>V: Leaving ED To Balloon</td>
<td>42.2</td>
<td>46.0</td>
<td>0.001</td>
</tr>
</tbody>
</table>

30-Day Mortality Trends Following Heart Failure in the Elderly by Age, Race, and Gender

Judith H Lichtman, John W Kart, Mikhail N Kosiborod, Yun Wang, Yale Sch Of Medicine, New Haven, CT; John A Spertus, Mid America Heart Institute, Kansas City, MO; Harlan M Krumholz, Yale Sch Of Medicine, New Haven, CT

Background: Although dramatic advances in the care of heart failure (HF) have occurred, the United States lacks a surveillance system to track national patterns of HF outcomes. We sought to examine 30-day mortality trends following HF admission using Medicare data. Methods: All Medicare fee-for-service (FFS) beneficiaries ≥65 years of age, discharged with HF (ICD-9 402.x1, 404.x1, 428.x) from 1993–2003 were included in the study. HF patients discharged from non-acute facilities, transfers, or those with <12 months of continuous FFS status were excluded. Crude 30-day mortality rates were examined by gender, age (65–74, 75–84, 85+), and race. Random effects logistic models compared annual mortality rates relative to 1993 within subgroups, after adjustment for demographic and clinical factors. Results: We identified 5,326,150 HF discharges from 1993–2003 (mean age 80 years, 58% women, 85% white). The mean age remained relatively constant over time, but rates of major comorbidities increased (range 1993–2003; AMI 15–21%, COPD 32–42%, DM 30–41%, HTN 30–63%). Crude mortality rates decreased within subgroups, except for those ≥85. Overall, risk-adjusted HF trends decreased over time (2003 to 1993, OR 0.95, 95% CI 0.94–0.97). Marked declines were observed for patients aged 65–74 (regardless of race or gender), marginal declines for patients 75–84, and no declines for those ≥85 (figure). Conclusions: Marked reductions exist in short-term mortality trends for elderly HF patients. Continued surveillance can provide important insights into the impact of healthcare innovations over time.

A Comparison of Algorithms for Identifying Incident and Prevalent Heart Failure Patients in Administrative Databases

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Most studies of heart failure (HF) in administrative databases rely on inpatient data only. Because HF can be diagnosed and managed in outpatient settings, inpatient data alone may underestimate heart failure cases. Our goal was to understand how reliably outpatient data can be incorporated into a algorithm for identifying incident and prevalent HF patients. We used linked Medicare claims data from 1991 to 1996 for 4,735 patients who were part of the Cardiovascular Health Study (CHS). The CHS is a prospective, cohort study of elderly adults. We applied multiple algorithms for HF case identification to the Medicare data. Medically inpatient and outpatient records with ICD-9-CM diagnosis codes of 428.x, 402.x1, 404.x1 or 404.x3 in any position were considered HF claims. All algorithms utilized inpatient HF claims, but differed in whether or not they utilized outpatient HF claims. The algorithms also differed on how many outpatient HF claims were required before a patient was considered to have HF. Using the centrally adjudicated HF outcome from CHS as the standard, we calculated sensitivity, specificity, and positive predictive value (PPV) for each algorithm. The first algorithm identified HF cases on the basis of the date of the first inpatient HF claim. This had a sensitivity of 0.74, a specificity of 0.87 and a PPV of 0.72. The second algorithm identified HF cases on the basis of the date of the first inpatient HF claim or the first outpatient HF claim, whichever was earlier. This had a sensitivity of 0.87, a specificity of 0.88 and a PPV of 0.90. The third algorithm identified HF cases on the basis of the date of the first outpatient HF claim or the third outpatient HF claim, whichever was earlier. This had a sensitivity of 0.82, a specificity of 0.87 and a PPV of 0.92. These results suggest that although an inpatient-only algorithm for HF is highly specific, it lacks sensitivity. Additionally, over one-fifth of HF cases were identified earlier when outpatient claims were considered. Requiring a single outpatient HF claim, however, produces many false-positives. An algorithm that combines a single inpatient HF claim and multiple outpatient claims may be most useful for identifying HF cases in administrative data.

Not Just Evidence-Based: Physician Decision Making Regarding Percutaneous Coronary Interventions for Stable Coronary Artery Disease

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Background: Percutaneous coronary intervention (PCI) is performed in patients with stable coronary artery disease, despite evidence that such interventions offer no mortality benefit. Physician judgment is a key input into the decision to perform PCI. Our objective was to examine the beliefs, practices, and decision making of physicians regarding the pathway to elective PCI. Methods: We conducted a qualitative study with 6 focus groups of 31 primary care physicians and 20 interventional and non-interventional cardiologists from varied locations in California. Participants discussed issues regarding PCI using hypothetical case scenarios. Data were analyzed as per the principles of grounded theory. Results: Both primary care physicians and cardiologists believed that if a patient had a positive imaging or noninvasive test for coronary disease, even if asymptomatic, they entered a cascade leading to catheterization and inevitably to PCI if a lesion was found. Reasons for referral for or performing PCI in asymptomatic patients included relief of patient anxiety, fear of missing a lesion, anticipatory guilt if no intervention was done and a cardiac event subsequently occurred, and medicolegal liability. Primary care physicians felt uncomfortable not referring patients with positive test results to cardiologists, and did not participate in decision making after referral. Cardiologists believed that upon referral, the patient and the referring physician expected further testing and intervention. Cardiologists also felt that opening arteries with PCI benefited patients, despite acknowledging that evidence shows PCI does not decrease risk of future myocardial infarction or death in patients with stable disease. Conclusions: The widespread use of PCI in patients with stable coronary artery disease - despite lack of evidence that such interventions offer clinical benefits - appears to be the result of a belief in the benefits of an open artery and a cascade effect of testing leading to procedures. Emotional and psychological factors, along with differences in SF-12 physical functioning or SAQ scores were found. Conclusions: Patients who quit smoking within 6 months following their MI have greater improvement in mental health than those who continue smoking, with continued improvement through 12 months.
Depression Partially Explains Worse Quality-of-Life Outcomes of Women Versus Men Following Acute Myocardial Infarction

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Background: Although women have worse health related quality of life (HRQL) outcomes than men after MI, the reasons for this are not clear. Since depression is more common in women than men at the time of an MI, and is associated with worse HRQL, we sought to examine whether depression may account for a portion of the gender disparities in HRQL outcomes. Methods: From 17 sites, 2411 patients were enrolled in the Prospective Registry Evaluating Outcomes after Myocardial Infarction: Events and Recovery (PREMIER) study between January 2003 and June 2004. HRQL at 1 year was quantified with the Seattle Angina Questionnaire (SAQ), which asks patients to rate their perceived health status (scale: 0-100). Depression was assessed at baseline using the Patient Health Questionnaire (PHQ), for which a score of 10 or higher indicates depression. Hierarchical linear regression, clustered within site, was used to evaluate the association between gender and 1-year HRQL, after adjusting for socio-demographic, medical history, clinical and treatment factors. Depression was then added to the multivariable model to evaluate whether it attenuated the gender effect on HRQL. Results: The mean age was 60.6 +/- 13 years and 67% (1614/2411) were men. Depression was present in 41.5% (638/1531) of men and 57.2% (430/752) of women at baseline (p < 0.001). One year post-MI, women had significantly worse HRQL (SAQ score = 83.1 +/- 19.0 vs. 85.5 +/- 17.4; p < 0.0005). In multivariable analysis, female sex remained significantly associated with worse HRQL (SAQ: Beta = -3.31 [-5.13, -1.50; p < 0.001]). The addition of baseline depression in the multivariable model attenuated, but did not eradicate, the gender effect on one-year HRQL (SAQ: Beta = -2.73 [-4.80, -0.87; p < 0.005]), an 18% reduction. Conclusion: Women have significantly worse HRQL 1 year after MI compared to men. Depressive symptoms, measured at baseline, partially explain the gender difference in HRQL outcomes. Studies are needed to determine if improved depression recognition and treatment after MI could improve HRQL outcomes and reduce gender disparities.

Ischemic Stroke: Outcome and Cost by Age and Gender

John W. Cochran, II; Inova Fairfax Hosp, Falls Church, VA

The outcomes, costs of care and length of stay (LOS) for all 372 patients with ischemic stroke at a large suburban hospital for the first six months of 2006 were reviewed. There were 121 patients with ICH. Data were stratified by age and gender. The cost for hospital treatment and Length of Stay (LOS) were also obtained. See chart and table. More men were discharged home than women (35% vs 25%, p = 0.2512, not significant). The percent of men discharged to skilled nursing home (SNF) was 16% vs. 27% for women (marginally significant, p = 0.0681). The mortality rate for men overall was greater than women (32% versus 20%, not significant p = 0.1573). The cost of treatment was higher for women than men in the > 65 year old group as was their LOS. Further investigation into this group of patients including reviewing a larger number may show some statistically significant differences beyond the trend toward significance in the number of women discharged to SNF.

Cost and Outcomes of Implantable Cardioverter-Defibrillators for Primary Prevention of Sudden Cardiac Death Among Medicare Beneficiaries

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Background: Despite the promising results of randomized clinical trials, the clinical outcomes and costs of implantable cardioverter-defibrillators (ICDs) when used for primary prevention of sudden cardiac death (i.e. in patients with no prior ventricular arrhythmias) in non-experimental settings are uncertain. The goal of this research was to measure health outcomes and costs among a nationally representative cohort of elderly, primary prevention ICD recipients.

Outcome and Cost of Treatment in Non-Traumatic Intracerebral Hemorrhage by Age and Gender

John W. Cochran, II; Inova Fairfax Hosp, Falls Church, VA

The outcomes for patients with non-traumatic intracerebral hemorrhage (ICH) at a large suburban hospital for the first six months of 2006 were reviewed. There were 121 patients with ICH. Data were stratified by age and gender. The cost for hospital treatment and Length of Stay (LOS) were also obtained. See chart and table. More men were discharged home than women (35% vs 25%, p = 0.2512, not significant). The percent of men discharged to skilled nursing home (SNF) was 16% vs. 27% for women (marginally significant, p = 0.0681). The mortality rate for men overall was greater than women (32% versus 20%, not significant p = 0.1573). The cost of treatment was higher for women than men in the > 65 year old group as was their LOS. Further investigation into this group of patients including reviewing a larger number may show some statistically significant differences beyond the trend toward significance in the number of women discharged to SNF.

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Methods: We collected health care cost and utilization data from a random sample of Medicare beneficiaries hospitalized for the first time with congestive heart failure between April, 2002 and December, 2003 who received a primary prevention ICD, as well as propensity-score matched control patients hospitalized for the first time with CHF during the same period who did not receive an ICD. Medicare enrollment data were used to determine subsequent mortality. Importantly, outpatient claims were used to quantify health care costs during and after the index hospitalization through December, 2004. A Cox proportional hazards model was fitted to the combined cohort of ICD patients and controls. A generalized linear regression model (log link) was fitted to predict costs. The incremental costs and benefits predicted by these models were then used to produce an incremental cost-effectiveness estimate. Results: We identified 332 primary prevention ICD recipients, of whom 315 (95%) were matchable to controls. Primary prevention ICD patients had significantly lower adjusted mortality (adjusted hazard ratio = 0.68, 95% confidence interval [CI] 0.46–0.90), with a projected increase in median survival of 0.85 years. ICD patients had higher adjusted health care costs in the first 30 days after initial hospital admission (mean = US$29,688, 95% CI US$25,300–US$33,800) and at one year (mean = US$32,841, 95% CI US$25,700–US$40,100). The projected cost effectiveness of primary prevention ICDs was US$48,800 per life-year gained. Conclusions: Primary prevention ICD implantation was associated with reduced mortality in a non-experimental, elderly population hospitalized for congestive heart failure. The costs of ICD implantation were substantial, but ICDs appeared to be cost effective by current standards.

Response to Symptoms and Perceived Risk Among Young Women With Acute Myocardial Infarction

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Background: Studies have shown that at least one traditional risk factor is present in 90% of AMI patients, but relatively little is known about the prevalence of risk factors among young women or minorities. Methods: We examined the prevalence of common risk factors for CHD among 108,302 patients presenting to cath lab with STEM1 or NSTEMI from over 600 sites participating in the ACC-NCDR Registry in 2005. Results: Rates of diabetes, hyperlipidemia, smoking, obesity, and diabetes were examined by gender, age (<55, 55+) and racial subgroups (Black, White). Results: Among 69,693 hospitalizations for men (6.2% Black, 32.4% <55 years) and 36,609 hospitalizations for women (8.6% Black, 19.3% <55 years), 92.5% had at least one risk factor, 72.6% had at least two, and over 42.5% had 3+ risk factors. The prevalence of 3+ risk factors ranged from 4.0%–61% across subgroups, and was markedly higher for Black women. Black women had the highest rates of diabetes (37.5% age 55+, 35.7% <55), hypertension (86.7% age 55+, 75.8% <55), and obesity (46.5% age 55+, 56.9% <55) as compared with other subgroups of patients. Rates of hyperlipidemia were similar across gender and race subgroups within age categories (range 51.6–61.7% age 55, 58.2–62.9% age 55+). Smoking was common for over half of younger patients, with no patterns evident by subgroups (range 55.7–62.1%). Smoking was less common for older patients (range 22.3–36.1%), but tended to be more common for Black men and women. Conclusions: Rates of modifiable risk factors are alarmingly high among MI patients. Targeting subgroups at greatest risk, particularly minority women may aid in identifying those in need of more intensive risk factor management.

14 Costs and Outcomes of Drug-Eluting Coronary Stents Versus Bare Metal Stents Among Medicare Beneficiaries

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Background: Clinical trials have demonstrated that drug-eluting stents (DES) confer no mortality benefit or reduction in adverse coronary events beyond bare metal stents (BMS) other than decreasing the need for repeat revascularization procedures. The clinical and economic outcomes of DES in routine clinical practice among the elderly are uncertain. Methods: Using Medicare claims, we identified patients emergently hospitalized during 2002–2003 with acute coronary events but no prior percutaneous coronary intervention (PCI). A propensity score model matched patients receiving DES to similar patients receiving BMS during the 9 months immediately following Food and Drug Administration (FDA) approval (April, 2003) of DES. A separate model matched DES patients to BMS patients hospitalized during the 9 months immediately prior to DES FDA approval. Medicare enrollment data indicated subsequent mortality. Cox proportional hazards models were fitted to the 2 independently matched cohorts. Inpatient and outpatient claims indicated health care utilization costs during the year after stent receipt. A generalized linear model was fitted to ascertain the adjusted cost of DES receipt. Bootstrap replications generated a 95% confidence interval (CI) for the 12-month cost of DES. Results: We identified 3,332 Medicare beneficiaries who received DES between April–December, 2003. Among these, 83% were matchable to contemporaneous BMS controls, while 98% were matchable to BMS controls hospitalized for the first time with CHF during the same period who did not receive an ICD. Medicare enrollment data were used to determine subsequent mortality. Primary prevention ICDs was $48,800 per life-year gained. Conclusions: Primary prevention ICD implantation was associated with reduced mortality in a non-experimental, elderly population hospitalized for congestive heart failure. The costs of ICD implantation were substantial, but ICDs appeared to be cost effective by current standards.

15 A Multi-Component Hypertension Quality-of-Care Score Predicts Longitudinal Blood Pressure Responses and Hypertension Control in a Hypertensive Cohort

Neelima Penugonda, Zongshan Lai, Dennis Tsilimingras, Mark Britton, Samar A Nasser, Peter Dews, John M Rack; Wayne State Univ, Detroit, MI

Background: Pharmacologic BP lowering reduces risk for morbidity and fatal micro-, macrovascular disease, and target-organ failure. Objective: To determine if a multi-component HTN Quality of Care (QOC) score predicts longitudinal reductions in BP and/or control of BP to below goal levels in a hypertensive cohort. Population: Three hundred and ninety hypertensive patients with BP above JNC 7 goals and at least 4 visits to the Wayne State University HTN Clinic between 10/1998 and 6/2006 were identified in the MedTrace EMR. Characteristics were: age 58 years, baseline BP 173/99 mm Hg, average of 2.6 antihypertensive drugs at first visit, women 276 (70.8%) and African Americans 344 (88.2%). Median follow-up was 22 months. Methods: Six HTN Process of Care (POC) measures derived from evidence-based POC measures or expert opinion were considered at each clinic visit: 1) prescribed a calcium-channel blocker or diuretic, 2) diuretic appropriate to the level of kidney function; 3) taking a diuretic if on >2 non-diuretic antihypertensive drugs; 4) increased intensity of antihypertensive treatment at visits when BP is above goal; 5) avoidance of NSAsIDs when eGFR <60 ml/min/1.73 m2; and 6) taking either an ACE inhibitor or an ARB if eGFR <60, spot urine albumin:creatinine ratio is >200 mg/g and/or diabetes mellitus is present. We next determined if each POC measure predicted longitudinal BP responses and control of BP to below JNC targets using mixed linear regression and Cox proportional hazards models, after controlling for age, race, sex, follow-up, and log-BTN severity score. The score from individual POC measures was combined into a composite HTN QOC metric (range 0–1) if the coefficient was directionally appropriate and its p-value in at least one of the regression models was ≤0.05. Results: All POC measures except #2 were included. Mixed models showed that a 1 unit difference in the HTN quality score predicted a 14.5/6.1 mmHg lower BP (95% CI: 3.2–6.4, P<0.0001) and a SBP control HR of 6.2 (95% CI: 3.2–11.9, P<0.0001) when controlling for other demographic variables.
Recognition of Decompensating Heart Failure by Chronic Heart Failure Patients and Their Significant Others

Jill R Quinn; Univ of Rochester, Rochester, NY

The decision to seek care for worsening symptoms of heart failure (HF) can be a difficult assessment to make by patients and significant others (SO). The purpose of this pilot study is to learn the role SOs play in the decision to seek care and how their perceptions match those of the patient. Based on the Common Sense Model of Illness Representation, individuals’ actions are based on how they identify symptoms, determine a cause, decide if symptoms are acute or chronic, consider the consequences, and decide if there is a cure. A sample of 22 participants (11 hospitalized HF patients and 11 SOs) was recruited from an inpatient environment with adequate supervision the quality of cardiovascular care is not dependent upon the time of year.

Use of medications at discharge

<table>
<thead>
<tr>
<th></th>
<th>July-August (n=129)</th>
<th>September-June (n=637)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspirin</td>
<td>84%</td>
<td>76%</td>
<td>0.03</td>
</tr>
<tr>
<td>Beta Blockers</td>
<td>80%</td>
<td>80%</td>
<td>NS</td>
</tr>
<tr>
<td>Statins</td>
<td>66%</td>
<td>64%</td>
<td>NS</td>
</tr>
<tr>
<td>Clopidogrel</td>
<td>20%</td>
<td>21%</td>
<td>NS</td>
</tr>
<tr>
<td>Heart Failure</td>
<td>25%</td>
<td>24%</td>
<td>NS</td>
</tr>
</tbody>
</table>

Conclusions: New trainees do not seem to adversely affect the quality of cardiovascular care as measured by the use of life-saving medications. Overall, however, the use of recommended therapies remains suboptimal according to established guidelines.

Dynamic Improvement Programs: Do They Make a Difference in the Immediate Post-Stroke Phase?

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Background: Quality improvement initiatives for acute stroke patients may result in better outcomes. The Paul Coverdale National Acute Stroke Registry (PONASR) monitors quality of care provided to patients having an acute stroke or TIA, based on currently accepted stroke performance measures. Methods: Four in-hospital stroke care performance measures were calculated as received, not received, or not indicated for all patients clinically diagnosed with stroke or TIA. The four performance measures studied are those that acute stroke patients, enrolled in ONASR from September 1, 2005 through September 30, 2007, who qualified for at least one PONASR in Georgia, Illinois, Massachusetts, and North Carolina.

Results: 6.3% of patients died in-hospital (11.7% of those receiving no PAPMs, 4.8% of those receiving some PAPMs, and 6.2% of those receiving all PAPMs). 60.6% of 22,922 patients received all PAPMs. 30.3% received some PAPMs, and 9.1% of patients received no PAPMs. Patients not receiving any of the four performance measures, where appropriate, were 2.04 (CI 1.26, 3.35) times as likely to die in hospital in a subset of 6229 patients with NIHSS collected. Conclusion: Receipt of no PAPMs shows a significant association with increased in-hospital death following acute stroke or TIA. Of 1750 stroke patients not qualifying for any PAPMs, 16.9% died.

Aerobic Exercise Reduces LDL-C in Adults With Type 2 Diabetes: A Meta-Analysis of Randomized Controlled Trials

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Objective: Use the meta-analytic approach to examine the effects of aerobic exercise on lipids and lipoproteins in adults with Type 2 diabetes. Methods: Studies were obtained via (1) computerized literature searches (PubMed, EMBASE, SportDiscus, Current Contents, Dissertations Abstracts International), (2) cross-referencing from review articles as well as original trials, (3) having selected hand searching selected journals, and (4) expert review of our reference list. Inclusion criteria for studies were (1) randomized controlled trials with a comparative non-exercise group, (2) aerobic exercise (no diet intervention) at least three days per week for 8 weeks or longer, (3) adult humans >=18 years of age, (4) all subjects classified as having Type 2 diabetes, (5) studies published in journal, dissertation, or master’s thesis format, (6) studies published in the English-language, (7) studies published between January 1, 1955 and October 1, 2006, and (8) assessment of one or more of the following lipid and/or lipoproteins in the fasting state: total cholesterol (TC), high-density lipoprotein cholesterol (HDL-C), low-density lipoprotein cholesterol (LDL-C), ratio of TC to HDL-C (TC/HDL-C), and/or triglycerides (TG). A random effects model was used for all analyses. Results: Seven studies representing 220 males and females (112 exercise, 108 control) were available for pooling. A statistically significant reduction of approximately 5% (Mean, -4.4 mg/dl, 95% CI, -11.6 to -1.1 mg/dl; -0.17 mmol, 95% CI, -0.31 to -0.03 mmol) was found for LDL-C, currently the primary target of lipid-lowering therapy in adults. This decrease was equivalent to a clinically significant reduction of approximately 8.5% in coronary risk. No statistically significant heterogeneity (Q = 2.8, p = 0.40; F = 0) or publication bias (p = 0.89) was found for LDL-C outcomes. No statistically significant changes were found for TC (Mean, -3.8 mg/dl, 95% CI, -8.9 to 1.3 mg/dl; -0.10 mmol, 95% CI, -0.23 to 0.03 mmol), HDL-C (Mean, 0.9 mg/dl, 95% CI, -1.8 to 3.6 mg/dl; 0.02 mmol, 95% CI, -0.05 to 0.09 mmol), TCHDL-C (Mean, -0.3, 95% CI, -0.7 to 0.1) or TG (Mean, -10.0 mg/dl, 95% CI, -26.6 to 6.5 mg/dl; -0.11 mmol, 95% CI, -0.30 to 0.08 mmol).

Conclusions: Aerobic exercise lowers LDL-C in adults with Type 2 diabetes.

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Correlates of Frailty in Patients With Coronary Heart Disease Undergoing Percutaneous Coronary Interventions

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Background: The growth of the elderly population has shifted the burden of coronary heart disease (CHD) towards the older age groups, compelling frailty, a construct germane to the elderly, to assume significance. Since frail individuals are at higher risk for hospitalization and death, it is important to characterize the magnitude and determinants of frailty in CHD. The available data on frailty in CHD are relatively old. Methods and Results: We analyzed correlates of frailty and intermediate frailty in 116 patients, >65 years at the time of PCI, in an ongoing prospective study at Mayo Clinic, Rochester. Preliminary assessment of frailty, and pre frailty was done per the Cardiovascular Health Study guidelines. Unintended weight loss (>10 lb in the preceding year), exhaustion, physical activity, walk time (15 feet criteria for frailty stratified by gender and height), and grip strength (stratified by gender and body mass index) was measured. Patients with ≥3 core elements were frail, and with 1 or 2 elements had intermediate frailty. Of 116, 23 (20%), and 65 (56%) had frailty and intermediate frailty respectively. We performed multiple ordinal logistic regression analysis to determine correlates of frailty and intermediate frailty. Older age (odds ratio per decade, 2.36, 95% CI 1.27, 4.40; P = 0.007), chronic kidney disease (CKD) (9.47; 3.14, 28.6; P < 0.001), and prior coronary bypass surgery (CABG) (2.50; 1.04, 6.02; P = 0.041) were covariates significantly associated with frailty as compared with patients not frail or with intermediate frailty. The c-statistics was 0.77 (bias-corrected 0.70) for the model. Conclusions: Older age, CKD, rheumatologic disorder, and prior CABG were associated with frailty in patients with CHD undergoing PCI.

Enhancing Lipid Measurement and Management in a Primary Cardiology Clinic

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Background: Patient lack of compliance with laboratory appointments separate from their clinic visits for measuring fasting lipid profile may hinder proper documentation and management of their lipids. Methods: A single cardiologist’s clinic notes from 2005, when patients were asked to have a fasting lipid profile a week prior to the clinic visit, were analyzed. The poor compliance prompted a same day as the clinic visit measurement of lipids for patients who could not comply with their laboratory appointment during the year 2006 (fasting or non-fasting) for most patients. Results were managed by a subsequent call to the patient. Only patients with documented coronary artery disease were included. Results: Out of the patients with documented CAD in 2005 only 61% (57/93) had documented lipid profiles compared to 83% (110/132) of patients in 2006. The average LDL in 2005 was 111 +/- 35 mg/dl compared with 86 +/- 31 mg/dl in 2006 (P = 0.01). Only 39% (23/57) of the patients in 2005 reached goal of <100 mg/dl, compared with 57% (67/119) in 2006. There were no significant differences in the HDL, TG levels or blood pressures documented during the concurrent visits. Out of the patient reviewed in 2005, 23% (13/57) had TG levels >200 mg/dl compared with 15% (17/110) in 2006. Conclusion: Better documentation and control of lipids may be obtained when lipids profiles are done on clinic visit day, with fewer burdens for the patients who cannot comply with a separate laboratory appointment. Although there were many non-fasting levels as a result, the triglyceride levels where not significantly different among the two groups, probably reflecting an overall more intensive lipid management in 2006.

Translating ATP III Cholesterol Guidelines Into Primary Care Practice: Cholesterol Education and Research Trial

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Objective: To determine if a multi-modal quality improvement intervention was more effective than academic detailing alone for improving adherence to the ATP III cholesterol management guidelines. Methods: A 1-year randomized controlled trial with practice as the unit of randomization was performed using 30 primary care practices in southeastern New England. Participants included 55 physicians, 10 midlevel providers, approximately 106 staff and medical records from 4,110 patients. All practices received a one hour academic detailing session. Intervention practices (IP) had a user-centered HeartAge risk calculation program placed on a computer kiosk in the practice’s waiting room. Each provider was given a PDA with a decision support tool (DST) for the ATP III guidelines, 4 booster academic detailing sessions, and a patient education toolkit. Intent-to-treat (ITT) and compliance analyses (CA) using general linear mixed models to account for clustering were performed. Results: At baseline, 85% (350/4110) of patients had screening lipid profiles, 64% (2614/4100) of patients were at their non-HDL goal and 57% (2333/4110) of patients were at their LDL goal. HeartAge risk calculator tool use was 12,617 visits and provider PDA tool use was 4,756 entries. ITT- After 1 year, there was no difference in the rate of cholesterol screening between the two arms of the trials. % Patients at their non-HDL goal improved: 78% (890/1190) [IP] vs 71% (849/1190) [C], p < 0.03 and showed a trend for LDL goals: 77% (811/1058) [IP] vs 72% (738/1012) [C], p < 0.08. After 1-yr, CA revealed practices with high use of the HeartAge risk calculator were more likely (OR = 2.43, 95% CI 1.87, 3.15) to have a full lipid profile than those with infrequent or no use. High use of the PDA DST providers were more likely that their patients were at non-HDL goals (OR = 1.25, 95% CI 1.05, 1.49) and LDL goals (OR = 1.42, 95% CI 1.20,1.67) than low or no use providers. Conclusion: This multi-modal quality improvement intervention demonstrated improved adherence to ATP III guidelines for non-HDL cholesterol but less conclusively for LDL goals. CA showed that the more the patient activation tools and PDA DST were used, the better the results in terms of screening and cholesterol management.

Anemia in Heart Failure Is Associated With Significant Health Resource Utilization and Costs in a Managed Care Plan

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Background: Studies have shown a high anemia prevalence and an association between anemia and mortality risk in heart failure (HF) patients, but few evaluations of the economic consequences of anemia in HF have been reported. This study assessed the association between anemia, health resource utilization (HRU) and costs in HF patients over a 12 month follow up period. Methods: This retrospective cohort study used claims data from a US health insurer maintained by Ingenix, a UnitedHealth Group Co. Inclusion criteria: age 40–84, plan enrollment for ≥6 consecutive months between 01/00–05/05, ≥1 claim with an ICD-9 code for HF, and ≥1 recorded hemoglobin (Hb). The 6 months preceding the 1st recorded Hb value were used to identify baseline comorbidities and HF. Subjects 65 and older were excluded to avoid under-ascertainment of HF from concurrent Medicare coverage. Mean Hb values during the 12 month period were used to define subjects as anemic using WHO Hb cutpoints (men <13 g/dl; women <12 g/dl). Generalized linear models were used to assess associations between anemia, HRU and annual costs. Hospital stay costs were calculated from DRGs. Inpatient/outpatient procedure and outpatient visit costs were calculated from the 2005 Physician Service Fee schedule. Multivariate regression models were adjusted for baseline demographics, comorbidities, a HF severity proxy (Ershler 2005) and HRU. Adjusted HRU and cost ratios (anemic divided by non-anemic estimates) were calculated. Results: Of the 13470 HF patients, 51% were anemic. Compared to non-anemics, anemic patients had a higher crude mean number of all-cause (0.74 vs 0.44) and HF hospitalizations (0.07 vs 0.03) and longer mean hospital stays (5.24 vs 2.57 days/event); respective adjusted HRU ratios were 1.39 (95% CI 1.30–1.49), 2.01 (1.58–2.54) and 1.41 (1.44–1.79). Anemic patients had higher overall crude mean costs vs non-anemics ($13141 vs $7768), driven by hospital stays ($6690 vs $4139/event); respective adjusted cost ratios were 1.27 (95% CI 1.20–1.34) and 1.39 (1.27–1.53). Conclusions: Anemia in HF patients is associated with significantly elevated annual HRU and costs in this younger population. These data support the need for research to characterize the HF population that may benefit from anemia treatment.
Psychosocial Predictors of Risk for Hospitalization Among Cardiac Patients


Depression and lack of social support negatively impact CVD treatment outcomes. The goal of this study was to determine whether assessment of depression and social support for cardiac patients improves prediction of risk for hospitalization based solely upon medical factors. The sample consisted of 583 patients with a diagnosed cardiac disorder, and receiving treatment in one of four cardiac clinics, who were recruited using a consecutive sampling design: 350 men (60%) and 233 women (40%) with varied (lifetime) CVD histories: MI (37%), stroke (11%), CABG or valve surgery (21%), PCI (27%), CHF (24%). All subjects completed a computerized assessment of their CVD medical history, depressive symptoms (DS), Social Support (SSS) and other psychosocial risk factors for cardiac morbidity and mortality. These patients were subsequently interviewed by phone each month for the next five months. Results: Average nights per month hospitalized for patients with depression scores in the normal (24) ranges was 5.5 nights, compared to 3.2 nights for subjects in the high range reporting 7.8 times as many nights hospitalized. Average nights per month hospitalized varied for patients with SSS scores in the high (23 nights), moderate (30) and low (.68) ranges, with subjects in the low range reporting three times as many nights hospitalized. Predictive models using medical factors alone (e.g., general health, history of cardiovascular problems and surgeries, co-morbid chronic medical conditions) correctly identified 50.4% of the patients hospitalized during the subsequent six months (sensitivity), and 63.5% of the patients that were not hospitalized (specificity). Addition of psychosocial factors improved sensitivity by 50% and specificity by 48% of hospitalized patients, with 49.1% specificity. Conclusion: Lower levels of social support and higher levels of depression were associated with significantly higher risk for hospitalization during the five months post-assessment, across a broad range of CVD disorders. The combination of psychosocial with medical factors substantially improves prediction sensitivity over models that include only medical factors, with modest reduction in specificity.

Neurology Consults for Patients Suffering TIA After CABG Do Not Appear to Reduce Post-Operative Morbidity, Need of Post-Discharge Medical Care, and Length of Stay

Bernardo J Reyes, Mike Broce, Rana Daulii, Mater Kali, Asmita Modak, CAMC INSTITUTE, Charleston, WV; Shahnara Patel, William Dees, Charleston, WV; Mike Whitler, CAMC INSTITUTE, Charleston, WV; Tanya Warwick; U California SF Fresno Med Education Program, Fresno, CA

Background: Transient ischemic attack (TIA) is a well-known complication among patients undergoing coronary artery bypass grafting (CABG). The influence of a consultant from a neurologist in patients suffering of post-CABG TIA improves the clinical outcomes of these patients.

Methods: Retrospective analysis of existing data from the Society of Thoracic Surgeons database and manual chart review of a high CABG volume tertiary care center between 2004 and 2006. Primary endpoints included myocardial infarction (MI), 30-day mortality, disposition at discharge and length of stay. Among the secondary end points, it was needed for postoperative mechanical ventilation. The study cohort consisted of post-CABG TIA patients receiving a neurology consult post-procedure (N = 58), and an equal number of propensity-matched patients without a neurology consult within the same time period.

Results: A larger number of home discharges or shorter lengths of stay were not observed among the study groups. Clinical outcomes were as follows: Conclusions: Including a neurologist in the treating team of patients suffering TIA after CABG is not related with a reduction in the incidence of post-operative morbidity, reduction in length of stay or patient disposition at discharge. Interestingly, we observed a significant reduction in the amount of mechanical ventilation needed among those evaluated by a neurologist.

Inaccuracy of Automated Electrogram Amplitude Measurements in Implantable Cardioverter-Defibrillators

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Introduction: Appropriateness of functioning of implantable cardioverter-defibrillator systems (ICDs) requires satisfactory intracardiac electrogram (egm) amplitude voltage measurements. Automated algorithms detect a sudden change in voltage and the peak amplitude over a fixed time. Differences between “automated” (A) and “manual” (M) egm amplitudes with present ICD systems have not been well assessed. Methods: We evaluated egm amplitudes via both methods in 48 consecutive patients with Medtronic ICDs (Models: 7230–26 pts; 7232–6; 7224–11; 7227–1; 7228–9). Results: Mean atrial egm amplitudes were 2.7 mV via “A” and 0.7 mV via “M” techniques. Mean ventricular egm amplitudes were 11.4 mV via “A” and 10.8 mV via “M” techniques. However, the differences between “A” and “M” measurements in any given individual ranged widely from -6.00 mV to +8.93 mV. The accompanying figure highlights the poor correlation between the two measurement techniques via regression analysis. The correlation coefficient (R) for the atrial egms was 0.67, while the ventricular correlation coefficient measured 0.42. Conclusion: Reliance upon automated egm amplitude measurements may lead to excessively high or low egm values which could result in inappropriate reprogramming of devices or unnecessary lead revision leads. Whereas manual measurements reflect the true filtered peak-peak egm signal, automated measurements in these devices rely upon a rectified peak signal captured within a 2 msec window. Reliance upon automated egm amplitude measurements should be avoided and may lead to inappropriate programming or even surgical intervention.

Risk Factors, Management, and Outcomes of Recurrent Aortic Dissection in Patients From The International Registry of Acute Aortic Dissection (IRAD)

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Background: Risk factors, management, and clinical outcomes associated with recurrent dissection of the aorta have not been previously studied. Methods: We studied 1,499 patients with acute aortic dissection (AAD) enrolled in IRAD from 1996 to 2005 to characterize the prevalence, risk factors, management and outcomes of patients with a history of a previous aortic dissection compared to those with de novo dissections. Results: Seventy-six (5.1%) patients had a history of prior AAD of which 46 (65.7%) presented with an acute type B dissection. Patients with a prior history of AAD were more likely to be younger, have a history of Marfan syndrome, and less likely to be Caucasian. Higher rates of prior aortic valve surgery were seen among patients with re-dissection, with a similar trend for mitral valve surgery. Patients with prior AAD were less likely to undergo surgical repair for their re-dissection. Despite these differences in clinical features, management and in-hospital mortality was significantly decreased among patients with prior AAD. Conclusion: Prior AAD was present in 5.1% of aortic dissection cases in IRAD. Patients with type B dissection and history of prior aortic dissection have better outcomes than patients without history of prior dissection. Although recurrent dissection patients are younger and have a greater frequency of Marfan syndrome and prior valve surgery, further study is needed to confirm these findings and gain understanding into potential reasons for the observed outcomes.

The Burden of Illness Analysis in Patients With High Normal Blood Pressure (Pre-Hypertension)

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Objective: To compare the burden of illness in patients with pre-hypertension to the US general population norms and patients with uncomplicated hypertension. Methods: Analyses were conducted using data from the National Health and Nutrition Examination Surveys (NHANES), The Medical Outcomes Study (MOS) Health Status Questionnaire Short Form (SF-36) was used to measure Health Related Quality of Life (HRQL). Multiple regression analysis was used for comparison of burden of illness to the US population norms and to the MOS cohort with uncomplicated hypertension. Results: Of the study participants 65% (441 of 734) were male and 83% (612 of 734) were Caucasian. The prevalence of chronic conditions
was low: cardiovascular disease (CV): 4.2% (31 of 734); type 2 diabetes: 1.4% (10 of 734); other: 16% (118 of 734). Compared to age and gender adjusted US population norms (n = 2031), the TROPHY participants had significantly higher SF-36 scores (better HRQL) than the general population in all of the eight scales and two summary measures (mean range: 1.91–4.31, p < 0.0001). After adjusting for chronic conditions (CV and diabetes), however, the TROPHY participants had significantly lower scores (worse HRQL) in all of the subscales except for role physical (RP), role emotional (RE) and mental component summary (MCS) (mean range: 1.14–2.53, p < 0.05). Compared to age and gender adjusted MOS uncomplicated hypertension norms (n = 1581), pre-hypertensive patients had a significantly higher score in three scales including RP, general health (GH), and RE as well as the physical component summary (PCS) (mean difference: 1.92–5.34, p < 0.01). After adjusting for chronic conditions, pre-hypertensive patients had significantly lower BP score (mean difference: 1.81, p < 0.05) and significantly higher GH (mean difference: 3.92, p < 0.05) compared to RE (mean difference: 1.57, p < 0.05). Conclusions: As measured by MOS and SF-36, the adjusted HRQL of pre-hypertensive patients is slightly worse than the US healthy population and is similar in several respects to the HRQL of patients with uncomplicated hypertension. While patients with pre-hypertension generally have higher function than patients with hypertension, there is already evidence of slightly worsening HRQL.

**Therapeutic Substitution of Statins: A Real-World Data-Driven Approach Based on NCEP LDL Goals**

Vincent J Willey, HealthCore, Inc., Wilmington, DE; Brian Sweet, WellPoint, Grand Island, NY; Martha McLaughlin, Chicago, Detroit, MI; Dean Smith, Diane Boldt, Patsy Bruenger, Sharon Van Ripper, Sandra Lins, Mauro Moscucci; Univ of Michigan, Ann Arbor, MI

**Objective:** To develop a quantitative measure of accuracy of data abstraction and of site coordinators’ performance in data abstraction in a large multicenter registry of contemporary Percutaneous Coronary Intervention (PCI). Background: The Blue Cross Blue Shield of Michigan Cardiovascular Consortium (BCMC) is a state-wide quality improvement (QI) registry of contemporary PCI which, similarly to other quality improvement registries, relies on data abstractors for data collection. To verify accuracy of data abstraction, audits have been conducted since the inception of the registry in 1997. In the past, site coordinators have received qualitative audits that lacked performance measures of data abstraction. Methods: Of the 280 demographic, clinical, and outcome variables collected, 26% were used in risk prediction models for fatal and non-fatal adverse outcomes, and 30 additional variables were used as quality improvement measures. These variables were assigned a deduction value based on a 0–100 scale i.e. 100 points deducted if death or serious adverse event occurred. Therefore, EUROACTION achieved its overall aim in raising standards of preventive cardiology care for high-risk patients and their partners in everyday clinical practice.

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**Development of a Quantitative Method to Evaluate Data Abstraction Validity in a Multi-Hospital Quality Improvement Registry**

Erin C Montgomery, Eva Kline-Rogers, Univ of Michigan, Ann Arbor, MI; David Share, Blue Cross Blue Shield Foundation of Michigan, Detroit, MI; Dean Smith, Diane Boldt, Patsy Bruenger, Sharon Van Ripper, Sandra Lins, Mauro Moscucci; Univ of Michigan, Ann Arbor, MI

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**34**

**Achieving European targets at one year (%)**

<table>
<thead>
<tr>
<th>Lifestyle</th>
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<th>Partners INT</th>
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<td>Physical activity</td>
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**BP ≤140/90 mmHg (<130/85 mmHg in diabetes)**

<table>
<thead>
<tr>
<th>Lipids: changes in proportions at target between initial and final assessment</th>
<th>Patients INT</th>
<th>Patients UC</th>
<th>Partners INT</th>
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<tbody>
<tr>
<td>TC ≤5 mmol/L</td>
<td>+13%*</td>
<td>-2%</td>
<td>+17%*</td>
<td>-1%</td>
</tr>
<tr>
<td>LDL-C ≤3 mmol/L</td>
<td>+20%*</td>
<td>-3%</td>
<td>+25%*</td>
<td>-3%</td>
</tr>
<tr>
<td>HbA1c ≤8%</td>
<td>+28%*</td>
<td>-3%</td>
<td>+30%*</td>
<td>-3%</td>
</tr>
</tbody>
</table>

**Cardioprotective medication**

<table>
<thead>
<tr>
<th>Antihypertensive therapy</th>
<th>Patients INT</th>
<th>Patients UC</th>
<th>Partners INT</th>
<th>Partners UC</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACE inhibitors</td>
<td>19</td>
<td>20</td>
<td>12</td>
<td>14</td>
</tr>
<tr>
<td>Statins</td>
<td>37*</td>
<td>23</td>
<td>22</td>
<td>15</td>
</tr>
</tbody>
</table>

**Overall Achieving European targets at one year (%)**

<table>
<thead>
<tr>
<th>BP ≤140/90 mmHg (&lt;130/85 mmHg in diabetes)</th>
<th>Patients INT</th>
<th>Patients UC</th>
<th>Partners INT</th>
<th>Partners UC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lipids: changes in proportions at target between initial and final assessment</td>
<td>+13%*</td>
<td>-2%</td>
<td>+17%*</td>
<td>-1%</td>
</tr>
<tr>
<td>LDL-C ≤3 mmol/L</td>
<td>+20%*</td>
<td>-3%</td>
<td>+25%*</td>
<td>-3%</td>
</tr>
<tr>
<td>HbA1c ≤8%</td>
<td>+28%*</td>
<td>-3%</td>
<td>+30%*</td>
<td>-3%</td>
</tr>
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**Cardioprotective medication**

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<thead>
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<th>Patients UC</th>
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<td>19</td>
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<tr>
<td>Statins</td>
<td>37*</td>
<td>23</td>
<td>22</td>
<td>15</td>
</tr>
</tbody>
</table>

**Impact of an Internet-Based Telemedicine System on Physical Activity Levels Among Underserved Populations**

Sagar Panse, Abington Memorial Hosp, Abington, MA; Carol Homko, Temple University Hosp, Philadelphia, PA; Abul Kashem, William Santamore, Alfred Bowe; Temple Univ Hosp, Philadelphia, PA

**Background:** Regular physical activity reduces the risk for developing heart disease, hypertension, and type 2 diabetes. We sought to determine the physical and psychological variables associated with activity levels including telemedicine system use and its impact on cardiovascular disease (CVD) risk factors among underserved rural and inner city participants. Methods: Subjects were enrolled in an one year telemedicine trial to reduce CVD risk. All individuals were given pedometers and received counseling regarding CVD risk reduction and benefits of physical activity. Subjects weekly reported weight, blood pressure and steps/day using a HIPPA compliant web-site. At baseline, exercise knowledge (percent correct), risk perception (7 point Likert scale with zero representing average risk) and exercise self-efficacy (5 point Likert scale with zero representing poor self-efficacy) were assessed. Results: Eight month data were available for 224 individuals (age = 59.6 ± 9.8 years; BMI = 36

**Table 1 - NCEP cardiovascular risk status and observed LDL reduction**

<table>
<thead>
<tr>
<th>Overall</th>
<th>Low Risk</th>
<th>Moderate Risk</th>
<th>High Risk</th>
<th>Very High Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>n=65,948</td>
<td>n=27,010</td>
<td>n=14,270</td>
<td>n=20,352</td>
<td>n=4,252</td>
</tr>
<tr>
<td>% in each risk stratification*</td>
<td>41%</td>
<td>22%</td>
<td>30%</td>
<td>7%</td>
</tr>
<tr>
<td>Baseline LDL (mg/dL)</td>
<td>159 (39)</td>
<td>170 (33)</td>
<td>161 (32)</td>
<td>148 (35)</td>
</tr>
<tr>
<td>Post-statin initiation LDL (mg/dL)</td>
<td>103 (30)</td>
<td>109 (30)</td>
<td>104 (29)</td>
<td>97 (30)</td>
</tr>
<tr>
<td>% LDL (mg/dL) reduction observed*</td>
<td>35%</td>
<td>36%</td>
<td>35%</td>
<td>34%</td>
</tr>
<tr>
<td>% LDL lowering required to achieve NCEP LDL goal*</td>
<td>6%</td>
<td>20%</td>
<td>35%</td>
<td>30%</td>
</tr>
</tbody>
</table>

*Low percentiles, * low risk NCEP LDL goal, +10% of goal, ‡ high risk NCEP LDL goal, † 100 mg/dL, ¶ high risk NCEP LDL goal, †† 100 mg/dL, †‡ high risk NCEP LDL goal, ‡‡ 100 mg/dL, ††† low risk NCEP LDL goal, ‡‡‡ low risk NCEP LDL goal, †††† low risk NCEP LDL goal.
31.9±6.3 kg/m²; 56% male; 33% African American) who were averaging 549.2 steps/day (±3618.8). Exercise knowledge scores were 72.2%±22.0 % and mean levels of risk perception and exercise self-efficacy were 0.35±1.3 (range 0 to 7) and 2.7±0.9 (range 0 to 5) respectively. Steps/day negatively correlated with systolic (r = -0.2; p < 0.01) and diastolic blood pressure (r = -0.1p < 0.05) and positively correlated with telemedicine system use (r = 0.1p < 0.05). Increased self-efficacy, lower BMI, and frequent data reporting (p < 0.05) predicted higher activity levels. No correlation was found between age, gender, exercise knowledge or perceived cardiovascular risk and steps/day. Conclusions: Underserved rural and inner city participants with increased self-efficacy and lower BMI had higher activity levels which were associated with lower systolic and diastolic blood pressures. Use of the telemedicine system supported these increases in physical activity.

Variations in resource patterns were observed by race and gender. The results also indicated

1.18) (all p-values

predicted higher activity levels. No correlation was found between age, gender, exercise knowledge or perceived cardiovascular risk and steps/day. Conclusions: Underserved rural and inner city participants with increased self-efficacy and lower BMI had higher activity levels which were associated with lower systolic and diastolic blood pressures. Use of the telemedicine system supported these increases in physical activity.

Healthcare Resource Use Among Elderly Patients Following Hospital Admission for Congestive Heart Failure

Teresa Zyczynski, GE Healthcare, Princeton, NJ; Eric Gemmen, Andrew Linnaesntadt, Murtuza Bharal; Quintiles, Falls Church, VA

Objective: To examine healthcare resource use among elderly patients following discharge from an initial hospital admission for congestive heart failure (CHF). Methods: A cohort of patients with an initial hospitalization for CHF as a primary diagnosis between Jan. 1999 and Dec. 2000 were identified from Medicare administrative claim files and followed for a period of one year. Healthcare resource use investigated included hospital readmissions, emergency room (ER) visits and physician office visits. Results: A cohort of 34,540 elderly patients with an initial CHF hospital admission in 1999 or 2000 were identified. Approximately 58% (20,147) of the CHF patients had a physician office visit while 32% (11,214) visited the ER within 30 days of their initial CHF admission. Within a year of their initial CHF admission, 70% (24,184) had an ER visit, 51% (17,532) were readmitted to hospitals for all causes and 20% (6,823) were readmitted for CHF. The likelihood of hospital readmissions was negatively associated with male patients (Odds Ratio (OR) = 0.88) and nursing home visits in the 12 months prior to the initial CHF admission (OR = 0.93). Hospital readmissions were positively associated with subsequent death in the year (OR = 17.82), provider region of Northeast (OR = 1.98) or South (OR = 1.71), admissions to hospitals in the 12 months prior to the initial CHF admission (OR = 1.17) and patient comorbidity with other chronic conditions (OR = 1.05). The likelihood of ER visit was negatively associated with male (OR = 0.90), African-American compared to whites (OR = 0.70) and home healthcare visits in the 12 months prior to the initial CHF admission (OR = 0.97), and positively associated with death in the year (OR = 6.40) and ER visits in the 12 months prior to the initial CHF admission (OR = 1.18) (all p-values <0.05). Conclusions: The large proportion of hospital readmissions and ER visits occurring shortly after discharge suggests that many CHF patients are not sufficiently managed once outside the hospital. Variations in resource patterns were observed by race and gender. The results also indicate possible differences in the management of CHF patients across US geographic regions. Opportunities exist for individualized interventions to improve the care of patients with CHF.

Healthcare Expenditures Among Medicare Beneficiaries With Congestive Heart Failure

Murtuza F Bharal, Quintiles, Falls Church, VA; Teresa Zyczynski, GE Healthcare, Princeton, NJ; Andrew Linnaesntadt, Eric Gemmen; Quintiles, Falls Church, VA

Objective: To examine healthcare expenditures among Medicare patients following discharge from an initial hospital admission for congestive heart failure (CHF). Methods: Statistical analyses were conducted on a national 5% sample of Medicare claims from January 1999 to December 2001. A cohort of patients with an initial hospitalization with a primary diagnosis of CHF was identified. Factors associated with total Medicare expenditures were assessed using a multivariate generalized linear regression model with a log-link and gamma distribution. The regression model included variables for patient characteristics, Charlson comorbidity index score, compliance with routine care, and healthcare use in the 12-month period prior to their initial CHF admission. Results: A cohort of 34,540 patients aged ≥ 65 years with an initial CHF hospital admission in 1999 or 2000 were identified. A majority, 29,843 (86%) of the CHF patients were white, one-half of the individuals were 80 years or older (17,299) and approximately 58% or 20,091 were female. The CHF patients were severely morbid with a mean (SD) Charlson score of 4.10 (2.98); 67% (9,241) had a score of 3 or more. The mean (SD) Medicare total expenditure among these patients was $36,230 ($55,086) in the year following the initial CHF admission. Healthcare expenditures among heart failure patients were negatively associated with provider region of Midwest compared to West (Relative Risk (RR) = 0.79), use of emergency room visits (RR = 0.98) and nursing home visits (RR = 0.97) in the 12-month period prior to the initial CHF admission and positively associated with death in the year (RR = 4.11), patient comorbidity (RR = 1.05), hospital admissions (RR = 1.09), outpatient visits (RR = 1.02) and home healthcare visits (RR = 1.01) in the 12-month period prior to the initial CHF admission (all p-values <0.05). Conclusions: Patients with CHF have substantial healthcare expenditures following their hospital admissions. Efforts to target interventions among patients that have a history of frequent healthcare resource utilization and with higher healthcare expenditures carries potential for cost-effective management of CHF patients.

Stable Angina Histories: Do Sex and Ethnic Differences Matter? A Prospective Study in 7794 Ambulatory Patients

Mohammed J Zaman, Cornelia Junghans, Univ College London, London, United Kingdom; Neha Sektiri, Newham Univ Hosp, London, United Kingdom; Ruoling Chen, Univ College London, London, United Kingdom; Gene Feder, Adam Timmiss, Queen Mary’s Sch of Medicine and Dentistry, London, United Kingdom; Harry Hemingway, Univ College London, London, United Kingdom

Background: Descriptors of stable angina pectoris were derived largely in white men and their diagnostic and prognostic validity in women and ethnic minorities is unknown. Women and South Asians may be misdiagnosed and therefore inequitably managed. Objective: To determine the extent of sex and ethnic differences in the diagnostic and prognostic value of detailed components of a patient’s history of chest pain, and whether differences can account for inequalities in management. Methods: Prospective, multi-centre cohort study of consecutive patients with chest pain attending 6 rapid access chest pain clinics in the UK (2676 white women, 2929 white men, 980 South Asian women, 1209 South Asian men). Patients with three or more typical descriptors (location, duration, quality and provocation) were defined as having typical angina. Endpoints were death due to coronary disease or admission with acute coronary syndrome over mean follow-up of 5.0 years and receipt of angiography and revascularization. Results: South Asians of both sexes were more likely to report non-typical responses for each descriptor compared to whites (P<0.001 for all comparisons). Typical angina symptoms in women and South Asians were as strong a predictor of angina diagnosis as they were in men and whites. In adjusted Cox regression models, there were no differences between ethnic groups in the probability of sustaining the coronary endpoint in both those with typical (HR comparing South Asians and whites 1.04 (95% CI 0.80 to 1.34) and non-typical pain (1.23 (0.68 to 1.71)), nor between sex (women compared to men, typical 0.67 (0.71 to 1.08), non-typical 0.56 (0.41 to 0.77)). South Asians and women were however less likely to receive angiography and revascularization than whites and men even among those with typical symptoms. Conclusion: Though both South Asian women and men attending chest pain clinic had an excess of non-typical chest pain descriptors, there were no ethnic or sex differences in the diagnostic or prognostic validity of anginal symptom classification. These findings suggest that clinicians can trust their history taking in different sexes and ethnic groups, and that sex and ethnic differences in symptom descriptors do not account for inequalities in healthcare.

Reducing Heart Failure Hospitalizations and Readmissions With Heart Failure Advocates: A Call to Action for Nursing

Donald E Casey, Jr., Atlantic Health, Morristown, NJ; William T Abraham, Ohio State Univ, Columbus, OH; Lin Guo, Xavier Univ, Cincinnati, OH; Jeanne Hitch, Case Western Reserve Univ, Cleveland, OH; Kim Miller, Catholic Healthcare Partners, Cincinnati, OH; Margaret W Namie, Mercy Health Partners, Cincinnati, OH; Ileana Pina, Case Western Reserve Univ, Cleveland, OH; Richard Snow; Applied Health Services, Columbus, OH

Background: Randomized clinical trials and observational studies have demonstrated the positive effects of multidisciplinary teams on Heart Failure (HF) readmissions. Many believe that such teams require the presence of an advance practice nurse specializing in HF. Objectives: We report on the effects of non-advanced practice nurses (Heart Failure Advocates, or HFAs)
Evaluation of Dyslipidemia Therapies in Elderly Patients: A Cost-Effectiveness Analysis Based on the National Health and Nutrition Examination Survey III

Daniel C Malone, Univ of Arizona, Tucson, AZ; Scott Charland; KOS Pharmaceuticals, Cranbury, NJ

Background: Cholesterol management guidelines recommend management of elevated low-density lipoprotein cholesterol (LDL-C), followed by management of high-density lipoprotein cholesterol (HDL-C) and elevated triglycerides in patients with dyslipidemia. Purpose: The objective of this study was to examine cost-efﬁcacy of dyslipidemia agents in elderly patients from the National Health and Nutrition Examination Survey III (NHANES III). Methods: A 6-month, cost-effectiveness analysis, incorporating dose escalation and adverse drug effects (ADEs) associated with lovastatin (L), pravastatin (P), simvastatin (S), ezetimibe/simvastatin (ES), and extended release niacin/lovastatin (ERNL) was conducted. Patients with high LDL-C and low HDL-C from NHANES III were included to estimate population values for lipids. Product labeling was used for lipid changes. Goals for LDL-C were <100 mg/dL and 40 or 50 mg/dL (males and females, respectively). Medication (WAC), physician office visits, and laboratory costs (Medicare’s allowance fees) were included. Monte Carlo simulations were conducted for probabilistic sensitivity analysis testing key assumptions of drug efﬁcacy, ADEs, and costs. Results: Rates of lipid goal achievement was a function of sex, age and treatment. Accounting for dosing and ADEs, the lowest cost for 180 days of treatment was E/S ($547), followed by ERNL ($629), pravastatin ($688), and simvastatin ($716). Attainment of LDL-C and HDL-C goals was highest for ERNL (83.3%), followed by P ($61.1%), S ($56.6%) and P (40.6%). Cost/patient achieving combined goals was $896 for E/S, $755 for ERNL, $1,265 for S, and $1695 for P. Both P and S were signiﬁcantly higher than E/S, while the incremental cost-effectiveness for ERNL at $365 per additional patient reaching goal was on the cost-effective frontier. Conclusion: This analysis suggests among patients with high LDL-C and low HDL-C treatment with E/S and ERNL are cost-effective strategies compared to either P or S.

Comparison of Hospital-Based Hemorrhagic and Ischemic Acute Stroke Care in Get With The Guidelines Stroke

Eric E Smith, Lee H Schwamm, Mass General Hosp, Boston, MA; Jerry Watkins, Adrian Hernandez, Duke Univ, Durham, NC; on behalf of the GTWGT Steering Committee and Investigators; American Heart Association, Dallas, TX

Background: Few data are available on the quality of hospital-based secondary prevention in hemorrhagic stroke. Many, but not all, risk factors for hemorrhagic stroke are also risk factors for ischemic stroke. We examined relevant measures for ischemic and hemorrhagic stroke care in the Get With The Guidelines (GTWGT-Stroke) database. Methods: Between 4/1/03–4/27/06 there were 662 hospitals with entries for 149,089 ischemic stroke/TIA (IS/TIA), 17,195 intracerebral hemorrhage (ICH) and 5,503 subarachnoid hemorrhage (SAH). We report on the following interventions: cholesterol reducing medications at discharge (Cholesterol-Rx), diabetes medications at discharge (Diabetes-Rx), weight-reduction management (Weight-Rx) and smoking cessation therapy (Smoke-Rx). Proportions for each intervention are shown. Results: The prevalence of peripheral arterial disease (PAD) increases with age. PAD is associated with an increased risk of adverse outcomes following surgical and invasive procedures, and with a poor long term prognosis. Current guidelines recommend that PAD should be treated as a coronary artery disease equivalent with evidence based therapies (EBT). Optimal utilization of EBT in elderly PAD patients undergoing peripheral vascular intervention (PVI) has not been well studied. Objective: To evaluate the age-related differences in utilization of EBT during the peri-procedural period in patients undergoing PVI. Methods: The study sample included 1545 patients (501 age ≥75, 1044 age <75) undergoing PVI in a regional, contemporary, multicenter, multidisciplinary registry. Peri-procedural characteristics, and use of EBT at baseline and prior to hospital discharge were compared between older (age ≥75) and younger (age <75) patients. Results: See table. Procedural success was >97% in both groups. When compared to younger patients, elderly patients were less likely to receive aspirin and statins at baseline. There was, however, an increase in utilization of EBT upon discharge from the hospital. Conclusions: Elderly PAD patients are not treated as aggressively with EBT as younger patients. These data suggest opportunities to improve care for all patients with PAD, but especially those with advanced age.
### 46 A Real-World Assessment of the Impact of Fibrin Acid Medication Therapy on the Attainment of Combined Target Lipid Levels in a Large United States Commercial Population

Robert J Simko, Abbots Labs, Abbott Park, IL; Ralph Quimbo, Chaitanya Sarawate, Healthcore, Inc., Wilmington, DE; Russel T Burge, Abbott Labs, Abbott Park, IL; Mark J Cziraky, Healthcore, Inc., Wilmington, DE

**Objective:** To evaluate the impact of fibrate therapy on the simultaneous attainment of target low- and high-density lipoprotein-cholesterol (LDL-C/HDL-C) and triglyceride (TG) levels.

**Methods:** This was a retrospective analysis conducted using the HealthCore Managed Care Database. The study population included patients with lipid panel lab values available and a minimum of 12 months health plan eligibility pre- and post-index date (defined as date of first full lipid panel on LDL-C, HDL-C, TG between 01/01/02 - 02/28/05). Target lipid level attainment was defined according to the NCEP ATP III guidelines. Generalized estimation equation modified logistic regression was developed to evaluate the association between fibrate therapy and simultaneous attainment of target LDL-C, HDL-C and TG levels. Model covariates included age, gender, presence of baseline CV co-morbidities, and presence of hypertension at baseline. **Results:** A total of 52,778 patients, contributing 132,279 lipid panels, were followed for a mean of 27 ± 10 months. Mean age was 54 ± 11 years, 54% male, and preventive care status classified as high-risk primary in 54% and secondary in 42%. Concomitant LDL-C, HDL-C and TG target level attainment was observed in 13% and 19% of patients at index and 48 months, respectively. In this population, lipid-altering therapy consisting primarily of statin monotherapy (77%), was prescribed in 31% of patients, after a post-index mean lag period of 10 ± 9 months. Only 4% of the population were initiated on fibrate based therapy (n: 1,870). The use of prescription fibrate therapy was associated with 13% (OR: 1.13; 95% CI, 1.00–1.27) increased odds of simultaneous LDL-C, HDL-C and TG target level attainment. **Conclusion:** In this managed care setting, 80% of high-risk patients were not at simultaneous LDL-C, HDL-C and TG target levels. Moreover, the majority of pharmacologically treated patients received statin monotherapy. The use of fibrate medications could increase the attainment of simultaneous target lipid levels.

### 47 Under-Recognition of the Metabolic Syndrome and Actual Cardiovascular Risk in Women

Carolyn Strmike, Margaret Latrella, Robert Faillace; St. Joseph's Regional Med Cntr, Paterson, NJ

**Background:** Approximately 25% of the adult American population has the metabolic syndrome (MS). The MS increases the risk of cardiovascular (CV) disease and the development of diabetes in both men and women. In recent years much has been published regarding the MS, but it is not consistently diagnosed during routine physical examinations. A recent survey of health care providers reported that the majority of physicians measure waist circumference, which is a key characteristic of the MS, less than 25% of the time. The Framingham Risk Score (FRS) is a widely utilized tool to determine risk stratification, but has been found to underestimate true cardiovascular risk in women. Hypothesis: The MS and actual CV risk in women are under-recognized. **Methods:** In this study we evaluated 535 women, between October 2005 and December 2006, for the presence of MS risk factors and for CV risk stratification at the Women's Heart Center at St. Joseph's. Each woman was systematically evaluated for the MS using the modified NCEP ATP III guidelines and risk stratified using the FRS. **Results:** A total of 135 women (25%) were diagnosed with the MS. Of the women diagnosed with the MS 44% of non-diabetics and 41% of diabetics were classified as low risk according to their FRS. Criteria for the MS occurred in the following percentages of patients: fasting blood sugars ≥100mg/dl 48%; waist circumference>35 inches 52%; HDL <50 mg/dl 67%; triglycerides >150 mg/dl 60%; BP ≥130/85 mmHg 72%. If waist circumference had not been measured, the diagnosis of MS would have been missed in 46% of these women. **Conclusions:** CV disease remains the number cause of death in women and the MS dramatically increases the risk for the development of heart disease. One of the key prevention strategies of CV disease and diabetes is the early diagnosis and treatment of the MS risk factors. Eighty-nine percent of the women we evaluated and diagnosed with the MS was a primary care physician, and less than 10% of these women had been previously informed of the diagnosis of the MS. The use of the FRS as the sole measure of risk stratification may underestimate a women's actual cardiovascular risk as evidenced by 41% of diabetic women categorized as low risk.

### 48 Regional Variation Within the United States in the Use of Secondary Prevention Interventions: The REduction of Atherothrombosis for Continued Health (REACH) Registry

Gregg C Fonarow, UCLA Med Cntr, Los Angeles, CA; Kim A Eagle, Univ of Michigan Cardiovascular Cntr, Ann Arbor, MI; Alan T Hirsh, Univ of Minnesota Sch of Public Health and Minneapolis Heart Institute Foundation, Minneapolis, MN; Robert M Califf, Duke Clinical Research Institute, Durham, NC; Mark J Alberts, Northwestern Univ Med Sch, Chicago, IL; William E Boden, Buffalo General Hosp and SUNY, Buffalo, NY; Deepak L Bhatt, Cleveland Clinic Foundation, Cleveland, OH; Christopher P Cannon; Brigham and Women’s Hosp & Harvard Med Sch, Boston, MA

**Background** Abundant data from multiple randomized trials support the pivotal role of secondary prevention among patients with atherothrombotic events. However, the impact of adherence to guideline-recommended prevention treatments among outpatient populations is less clear. The REduction of Atherothrombosis for Continued Health (REACH) registry is an ongoing international, prospective, longitudinal study of over 68,000 patients with atherothrombosis managed in primary care within 45 countries. **Methods** Data on patient characteristics and medication use were collected at baseline. Logistic regression was employed to assess the effect of regional variation on the use of primary and secondary prevention therapies. **Results** Data for 26,270 patients in the U.S. were analyzed and summarized in the table below. Without accounting for potential confounders, over half of all patients were using at least 3 of 4 classes of preventive therapies at baseline. Compared to patients in the Northeast, those in the Midwest, South and West were 12% (95%CI, 5–20%), 16% (CI 9–22%), and 13% (CI 5–21%) less likely to use at least 3 of these medications, respectively. Symptomatic patients were 1.5 times more likely than asymptomatic patients (with ≥3 risk factors) to receive preventive care (p<0.001). Conclusion In this study, use of secondary preventive medications in the US is greatest in the Northeast. In all regions, however, at least 20% of patients still do not receive at least one preventive medication.

<table>
<thead>
<tr>
<th>Region</th>
<th>Northeast</th>
<th>Midwest</th>
<th>South</th>
<th>West</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. patients</td>
<td>5204</td>
<td>6427</td>
<td>10191</td>
<td>4628</td>
</tr>
<tr>
<td>Number of patients treated</td>
<td>2717</td>
<td>5348</td>
<td>4987</td>
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</tr>
<tr>
<td>p-Value</td>
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<td>0.001</td>
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<td>0.001</td>
</tr>
</tbody>
</table>

### 49 Is Quality Improvement Sustainable? The Example of American College of Cardiology’s Guidelines Applied in Practice

Adevusa B Olomo, Manfred Stommel, Margaret M Holmes-Rovner, Andrew R Prieto, William D Corser, Michigan State Univ, East Lansing, MI; Kim A Eagle, Univ of Michigan, Ann Arbor, MI

**Objective:** Quality Improvement (QI) strategies in hospitals have been successful in improving care, but sustainability has not been established. There is an urgent need for evidence beyond the initial implementation period. The objective of the study was to examine the sustainability of QI intervention by the American College of Cardiology’s Guideline Applied to Practice (ACC/GAP) in Acute Coronary Syndrome (ACS) in Michigan. **Methods:** In this prospective observational study, 516 ACS patients admitted consecutively to 5 mid-Michigan community hospitals one year after the GAP intervention were compared to 498 immediate post-GAP patients. The main outcome measure was adherence to guideline medications and recommendations in patients without any contraindications. Independent predictors of medication use were determined using multivariable logistic regression analysis. **Results:** One year after ACC GAP implementation, adherence to most medications remained high. There was an increase in the in-hospital use of beta-blocker (88.9% [203/231] (recent) vs 72.1% (88/122) (past) p<0.001), while cholesterol assessment within 24 hrs of admission did not change significantly. The rates of prescription of aspirin (83% [401/483] vs 90% [190/211] p<0.018) and BB (84% [194/231] vs 92% [80/87] p<0.016) remained higher than before. Use of ACE inhibitors at discharge and treatment of patients with LDL ≥100 were unchanged. Predictors of being prescribed guideline medications were male gender for aspirin (OR 1.96 p<0.05) and BB (OR 2.95 p<0.05). Also, treatment with PCI was a significant predictor for aspirin prescription (OR 3.11 p<0.05), and lipid lowering therapy (OR 6.27 p<0.01) compared to CABG (OR 2.52 p<0.05; 1.13 p>0.05), respectively. Finally, prescription rates for discharge medications differed significantly by hospital of admission. **Conclusions:** Early benefits of the Mid-Michigan ACC GAP on guideline use were largely sustained at one year. Our findings suggest that hospital changes in treatment based on a relatively simple intervention process in accordance with established guidelines are sustainable. Differences in ACS guideline adherence by treatment modality and hospital pose challenges for follow-up phases of ACC GAP.

### 50 Prescription Refill Behavior for Nifedipine Therapy is Significantly Associated With Medication Cost

Simon H Magowan, Neil Accortt, Procter & Gamble Pharmaceuticals, Mason, OH; Diana Bruner, Univ of Utah, Salt Lake City, UT

**Background:** Information on the medication refill behavior in patients on calcium channel blockers can assist in physician counseling to maximize persistence. The nifedipine group is the largest within its drug class possessing different...
Coronary Syndromes
Clinical Management and Outcomes of Elderly Patients With Acute Venous Disease Burden Doubles in the Outpatient Setting, Yet Who is Carrying the Weight?
Sameer A Gafoor, Sahand Rahnam-Moghadam, Gilbert R Upchurch, Peter K Henke, Thomas K Wakefield, James B Froehlich; Univ of Michigan Hosps, Ann Arbor, MI

Background: Venous disease (venous stasis disease, ulcerations, varicosities and thrombo-phlebitis) constitutes a common clinical problem, with estimates of prevalence between 2% and 40%. Little is known about the amount of care delivered nationally to patients in the ambulatory setting or the providers who render that care. Methods: The National Ambulatory Medical Care Survey (NAMCS) is a nationwide outpatient office visit registry that is weighted to permit national estimates. We analyzed demographic and care data for patients with reported diagnoses of varicose veins, stasis ulcers, varicosities or thrombophlebitis between years 1995 and 2003. Results: We found that venous disease reporting more than doubled between 1995 and 2003 (4,675,528 to 9,636,015, p<0.001), with an average of 5,804,093 office visits per year. Most patients were female (68.3%) and white (90.1%). The mean age was 63.4 years and 47.8% had their care paid by Medicare or Medicaid. Family practitioners and general internists saw the majority (59.3%) of patients, followed by general surgeons (7.4%) and cardiologists (6.7%). This relationship was preserved throughout much of the time period (figure). Conclusion: Venous disease diagnoses are increasing in the outpatient setting, and primary care providers are carrying the burden of care. These data suggest more training in venous disease diagnosis and management may be necessary for primary care providers to meet this need.

Clinical Management and Outcomes of Elderly Patients With Acute Coronary Syndromes
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Background: Elderly patients have the highest rate of acute coronary syndromes (ACS) of any age group, yet are underrepresented in clinical trials. We examined the current treatment practices and six-month outcomes for elderly patients presenting with an acute coronary event. Methods: We evaluated 3209 consecutive patients with ACS admitted to the University of Michigan between September 1995 and October 2005. 732 were 75 years and older (“elderly”) and 2476 were under 75. Our primary outcome measures were treatment type and six-month mortality. Multivariable logistic regression was used to assess for independent associations between age, treatment type and six-month mortality after adjusting for history of congestive heart failure, angina, previous myocardial infarction, diabetes, smoking, and gender. Results: Elderly patients were less likely to be treated with an invasive intervention (PCI with stent) than younger patients (29% vs. 43%, p<0.001). Elderly patients who were treated with PCI and stent experienced approximately half the risk of death at six-month follow-up as elderly patients treated medically (OR=0.524, p=0.012). Elderly patients were less likely to be discharged on a statin than younger patients (66% vs. 78%, p<0.001). Elderly patients who were discharged on a statin experienced a 45% reduction in risk of death in six months versus elderly patients not discharged on a statin (12.5% vs. 23%, p<0.001). The potential treatment gap by age increase when examining “very elderly” patients; those 65 years and older versus patients under 65. Very elderly patients were even less likely to be discharged on a statin than younger patients (60% vs. 76%, p<0.001). When very elderly patients were discharged on a statin, they experienced a reduction in six-month mortality (14.2% vs. 35.3%, p<0.001). Conclusions: Compared to younger patients, elderly patients with ACS are less likely to receive evidence based therapies (EBT) and coronary revascularization. Whether this reflects a true age-based treatment gap versus unmeasured referral bias is unknown, but our data argue for further research in this underrepresented cohort. When elderly patients receive EBT, they experience a similar reduction in six-month mortality as their younger counterparts.

Signal Detection Decision Tree for Risk Stratification for Cardiovascular Disease in Women
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Background: Although there are many statistically independent risk factors for Cardiovascular Disease (CVD), not all risk factors may be clinically relevant in assessing risk. A Signal Detection Decision Tree (SDDT) is a type of regression tree analysis based on sensitivity and specificity (clinical relevance) rather than statistical significance, and may offer efficient risk stratification. Methods: A SDDT approach was used to evaluate CVD risk markers (Age, Systolic Blood Pressure, Diastolic Blood Pressure, Body Mass Index, Physical Activity Index (PAI), Total Cholesterol, Triglycerides, High Density Lipoprotein Cholesterol, Low Density Lipoprotein Cholesterol (LDL), Treatment for Blood Pressure, Smoking Status, Diabetes, Treatment for Cholesterol, and C-Reactive Protein) in 1701 women in the Framingham Offspring Study to predict CVD events (myocardial infarction [recognized or unrecognized], coronary insufficiency, angina pectoris, stroke, transient ischemic attack, cardiovascular death, peripheral vascular disease or congestive heart failure) at 10 years of follow up. The optimal cut-point across all variables and cut-points is identified at each branch point. Results: The figure below shows the hierarchical order of CVD risk factors in women. The highest risk group (55%) is defined with only three risk factors (Age >= 65 years, LDL >= 167 mg/dL, and PAI <33). Conclusion: SDST may be a method to rationally guide testing for risk factors in CVD, and quickly identify high and low risk groups with a minimum number of tests. SDST offers a clinically relevant and efficient CVD risk stratification method, and merits further investigation in this regard.

Hyponatremia in Patients Presenting With an Acute Coronary Syndrome: WHY Does it Matter?
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Background: Hyponatremia, is associated with adverse outcome in patients with heart failure and ST elevation myocardial infarction (STEMI). But role of hyponatremia has not been studied in patients with Non-ST elevation myocardial infarction (Non-STEMI). Methods: We prospectively studied 1478 consecutive patients without ST elevation, admitted with suspicion of MI. All patients had a sodium level determined at time of admission, 24hrs, 48hrs and discharge.Univariate logistic regression modeling was performed to analyze the relationship between hyponatremia (sodium <135meq/dl) and 30 day adverse outcome (recurrent MI or death). Results: Of the 1478 patients, 341 (23.1%) were hyponatremic on presentation. Mean age was 65.9 years, with majority of patients being male (97.3%) and white (81.5%). There were a total of 132(8.93%), 30-day adverse events. Patients who had hyponatremia on admission were significantly more likely to suffer an adverse outcome (OR=1.7, 95% CI=1.1-2.5, p=0.009) after adjusting for factors like age, left ventricular ejection fraction, diuretic use, chronic renal insufficiency, and elevated troponins. The degree of severity of hyponatremia correlated with increasing number of adverse events. Patient with admission sodium of <130 meq/dl had an adverse rate of 20.3% versus 12.1% in patients with sodium between 130 meq/dl and 135 meq/dl (p<0.001). Conclusions: Hyponatremia on admission is an independently associated with 30 day adverse outcome in dose-response relationship in patients with Non-ST elevation MI. Further studies are needed to analyze whether hyponatremia can be included as a marker in risk stratification model.
Economic Burden of Contrast-Induced Nephropathy: Implications for Prevention Strategies and Quality Improvement Initiatives


Contrast induced nephropathy (CIN) is the third most common cause of hospital-acquired acute renal failure after hypotension and surgery. There is increasing evidence that CIN has a significant economic impact on patient morbidity and mortality. Reduction in the rate of CIN has been identified as one of the key patient safety practices by national quality organizations. Currently, there is no systematic assessment of the economic burden of CIN and this information is critical to assess the cost-effectiveness of interventions to reduce the incidence of CIN. To investigate this, we estimated the one-year in-hospital and one-year cost of CIN. We performed a literature search using several databases including MEDLINE® and the Cochrane Library to estimate the incidence of CIN and understand the short-term and long-term sequelae of CIN. Using the parameters values obtained from the literature search, we developed a decision analytic model using Microsoft Excel to estimate the in-hospital and one-year cost of CIN. One-way and two-way sensitivity analyses were performed using low and high cost values and varying the rate of CIN. In addition, we perform extrapolations to assess the future costs of CIN using various population risk profile. Patients who develop CIN are likely to experience adverse outcomes. On average, patients have longer hospital and ICU stays, and have higher mortality rates. The average in-hospital cost of CIN is $10,345 (range from $5,032 to $12,959) and the one-year follow-up cost is $1,234. The one-year cost of treating a patient with CIN is $11,579 (range of $6,266 to $14,193). When averaged across all patients undergoing percutaneous coronary procedures, the incremental cost of CIN is about $1,000 and even our lowest predicted cost is estimate over $500. With the general aging of the population and growth in chronic conditions such as diabetes, we can anticipate that there will be an increase in the number of patients with risk factors for CIN. Therefore, without targeted interventions to reduce the incidence of CIN, the cost of CIN will continue to increase. Given the overall high economic burden of CIN, even relatively expensive interventions may prove to be cost-effective in improving patient safety and quality of care.

Reducing Hospitalization for CHF Patients through Telehealth

Gale M Bucher, Julie Holt, Andrea Dickerson, Diane DeCari, Christiana Care VNA, New Castle, DE; Ina Li; Christiana Care Health System, New Castle, DE

Christiana Care Health System Visiting Nurse Association Reducing Hospitalization for CHF Patients through Telehealth Objective: The objective was to assess whether telehealth (telemonitoring, remote monitoring) could reduce hospitalization for congestive heart failure (CHF) receiving home care. The primary goal was to provide timely response to urgent and emergent care needs. A secondary goal was to manage nursing resources effectively by providing visits when clinically indicated rather than advance scheduling. Methods: Medicare patients with CHF receiving home care were provided with a telemonitor in the home as an adjunct to nursing visits for skilled care. Patients received training on how to transmit vital signs, pulse oximetry and weight measurement. Data was transmitted via telephone line to a central monitoring station where the patient’s clinical status was evaluated daily and was assessed by the central station nurse. In addition, the patient was instructed to answer “yes/no” to 1–5 individualized questions regarding symptoms. Strategies included frontloading visits and eventual wearing of nursing visits to every other week. Patients were encouraged to purchase a scale and blood pressure cuff to continue self monitoring after the telemonitor was removed at, or prior to, home care discharge. Results: Value was seen in prompt detection of abnormalities and intervention to improve outcomes. Medicare patients with primary CHF receiving telehealth required unplanned hospitalization approximately 30% less frequently (20;10 out of 50) compared with the CMS risk adjusted reference (31.2%) and non-telemetered patients (29%; 29 out of 100). Conclusion: Telehealth decreases unplanned hospitalization rates in patients with CHF receiving home care. Our result is lower than the national reference. Possible reasons may be frontloading strategies and equipment selection. Telehealth is a useful tool in managing nursing resources under Prospective Payment and positions the agency for Pay for Performance under Medicare. Providing structure to the program in the form of decision algorithms improves efficiency and outcomes.

Glycemic Control for Cardiovascular Surgery Patients: An Integrated Approach

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Coronary RIsk Factors InitiatiVE (LIVE) Program aims to achieve LCL-C levels <100mg/dL in diabetic, 78% hypertensive, 35% both diabetic & hypertensive, 69% elevated cholesterol, 53% diabetics, 91% of all patients with CHF. Retrospective chart review of all adult CVS cases in 2006 identified 18% CHF patients. Cardiac anesthesiologists, intensive care and surgical nursing, endocrinology, cardiac perfusionist for adult CVS patients at New York University Hospitals Center starting January 2006. The protocol is incorporated in the operating room, specifies parameters for glucose monitoring and initiation of CII, and provides guidance for transition from CII to daily insulin. Compliance with the protocol for hyperglycemic patients and its impact on postoperative glycemic control for all CVS patients were measured by sampling of consecutive CVS cases quarterly. Results: There were 657 adult CVS cases in 2006; 21% (47/227) had a history of diabetes, 80% (132/164) experienced perioperative hyperglycemia (intraoperative glucose >180 mg/dL and/or early postoperative glucose >140 mg/dL). For hyperglycemic patients, protocol adherence and safety improved during 2006 (table). Sampling all adult CVS patients, adequate glucose control (60%;60 glucose checks 70–150 mg/dL) rose from 40% (8/20) before protocol initiation to 91% (58/63) after protocol initiation (p<0.001). Conclusions: Perioperative glycemic control following CIV is achievable and safe. It requires a multidisciplinary approach which incorporates both role-based care processes for the operative, intensive postoperative, and post-intensive care periods.

A Disease Management Program Successfully Controls Cholesterol Levels and Hypertension in CAD Patients: Results of the LIVE Program

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Introduction A prior study (A-SACT) documented LDL-cholesterol (LDL-C) goal attainment rates in Singapore as less than 30%. A disease management program was introduced in Aug 2006 to improve LDL-C and blood pressure control rates in CAD patients. Methods The Control of Coronary Risk Factors Initiative (LIVE) Program aims to achieve LDL-C levels <100mg/dL and blood pressure levels <140/90 mmHg (non-diabetics) and <130/80 mmHg (diabetics) through a disease management process. All CAD patients admitted to the Cardioiology Departments in 3 large public hospitals are automatically enrolled in this multidisciplinary program. Results 2403 consecutive patients with documented LDL-C >100mg/dL were prospectively enrolled from 1 Aug 2006 to 30 Aug 2006, with 2020 remaining in the program after deleting for deaths & CHF admissions. Mean followup was 12 months (range 5–17). Mean age 60(SD) 13 years, 23% women, 41% diabetic, 78% hypertensive, 35% both diabetic & hypertensive, 69% elevated cholesterol, 53% with both hypertension and raised cholesterol. At hospitalisation, mean Total Cholesterol (500 (SD) 50) mg/dL, LDL-C 132(SD) 39 mg/dL. LDL-C was evaluated in 96% of the cohort. At discharge, 2000 patients (99%) were prescribed statins (88% simvastatin, 3% atorvastatin, 2% rosuvastatin, 6% lovastatin). 160 (8%) were prescribed statins equipotent to simvastatin 40 mg or more. In hypertensives, mean blood pressure was 164(SD)25 / 87(SD)25 mmHg. Overall 1184 (86%) patients with elevated LDL-C & 1021(85%) hypertensives achieved the pre-specified goals. Of those who achieved and did not achieve LDL-C target, the mean dose of simvastatin 40 mg and 60 mg respectively. 210 (15%) of all patients with high LDL-C underwent dose titration. 54 (%) did not achieve goal with simvastatin monotherapy but did so with simvastatin-ezetimibe dual therapy. In all 1576 hypertensives, 65 % & 35% were on mono- & combination therapy. In hypertensives not attaining goal, 25% were on monotherapy and 75% were on combination therapy. Conclusion In CHD patients managed by half of Singapore’s public health sector 1) LDL-C goal attainment reached 90%, largely with generic statins 2) blood pressure goal attainment was at 65% These testify to the success of the LIVE program in the secondary prevention of CAD.
Cost-Utility Analysis of Erythropoietin Treatment for Anemic Heart Failure Patients

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Objectives: Previous studies have suggested that anemia is common in patients with heart failure (HF) and is associated with both impaired quality of life and prognosis. Several pilot studies targeting treatment of anemia in HF patients have demonstrated promising clinical benefits. The goal of this study was to assess the economic burden of anemia in HF patients and the potential clinical benefits of treatment of such individuals with erythropoietin.

Methods: Design: Cost-utility analysis using a 5 state Markov Model representing different strata of hemoglobin (Hb) levels (<13.4 g/dl; 12.1–13.4 g/dl; 10.1–12 g/dl; <10.1 g/dl) and death. Data sources: STAMINA-HFP registry for age, Hb levels, Hb-dependent hospitalization and mortality rates; Medicare reimbursement rates as a proxy for costs in the US health care; efficacy, utilities, and erythropoietin costs from the literature. Target population: Patients with HF and a Hb level of 12 g/dl or less. Time horizon: lifetime. Perspective: societal. Intervention: Standard care for HF according to AHA/ACC guidelines vs. erythropoietin for twelve months.

Results: For a population aged 63 at onset of HF (74% with Hb <12 g/dl), our preliminary model projected a mean quality-adjusted life-years gained (QALY), life-years gained (LYG), and lifelong undiscounted direct medical costs, incremental cost-utility ratio (ICUR), using a discount rate of 3% per annum, for costs and effects.

Conclusions: Based on our preliminary model, over a plausible range of values on our key assumptions, treatment of anemic HF patients with erythropoietin appears to be economically attractive. Randomized clinical trials to validate these assumptions are necessary.

Physical Functioning Among Women and Men With Angina in NHANES 1999–2002

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Background: Angina limits physical functioning among ischemic heart disease patients. This study assessed differences in physical functioning between men and women with angina.

Methods: Pooled data from U.S. residents who participated in the continuous National Health and Nutrition Examination Survey (NHANES) conducted in the years 1999–2000 and 2001–2002 were evaluated. Respondents with angina were conservatively defined as reporting they had been told by a doctor in the five years prior to completing the NHANES survey that they had angina, and/or responding that they had filled a prescription for nitrates in the last month. The hypothesis that women would report more difficulty with physical functioning was evaluated using the Physical Functioning Questionnaire (PFQ). Six PFQ items focusing on moderate and hard levels of physical exertion were identified. A logistic regression model with key predictors was fit to these data in a preliminary model.

Results: Of the 18,608 respondents, 5,587 reported having angina. Men had higher scores than women on PFQ items (walking one mile: 46 vs 41, p < 0.05; walking up 10 steps: 32 vs 26, p < 0.05). Analysis of demographic variables showed that these differences were not due to differences in age. In the final model, PFQ item scores were higher for men across all age groups. Age was a significant predictor of PFQ scores, and women were more likely to have difficulty walking on level ground but this difference did not reach statistical significance (p = 0.300).

Conclusions: Both men and women with angina are compromised in terms of physical functioning. However, a greater proportion of women than men reported having difficulty with moderate and hard levels of physical activity, regardless of age.

Determinants of Obstructive Premature Coronary Artery Disease in Young, Urban, Minority Patients Undergoing Coronary Angiography

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Objective: CAD risk is poorly defined in urban minority populations particularly in younger patients. We sought to define the inter-relationships between cardiac risk factors (CRFs), race and premature CAD (PCAD) in this population. Methods: Data from 416 patients (<40 yrs old undergoing coronary angiography for suspected CAD at Cook County Hospital were analyzed as an open cohort by blinded angiographic review for presence of obstructive CAD (>50% epicardial stenosis). Risk of CAD by race and CRFs was estimated via stepwise logistic regression, adjusted using the bootstrap resampling method. Results: Of 416 patients, 33% (136) had PCAD (86% with >70% stenosis). Multivariate regression found dyslipidemia (OR 3.2, p < 0.001), smoking (OR 2.0, p < 0.05), and male gender (OR 1.3, p < 0.06) to be associated with PCAD. Significant interaction between race and PCAD was noted (p < 0.002). Race-related PCAD risk was: Hispanic (OR 0.5, p < 0.13), Asian-Indian (OR 2.3, p < 0.02), and White (OR 1.8, p < 0.01) (compared with Black race). The impact of race and CRFs on PCAD risk is seen in Figure 1. Conclusions: In urban minority patients, prevalence of PCAD was highest in Asian-Indians and Whites. Dyslipidemia, DM and smoking were also unstable (unstable angina, NSTEMI, and STEMI). Data included baseline clinical characteristics, angiographic and therapy data. ISR lesion complexity was classified using Mehran criteria (Types I-V) and also dichotomized to simple (Type I) vs complex (Types II-IV) (Circ 1999; 100:1872–1878). Stented segments were analyzed using quantitative coronary angiography. A multivariate regression model predicting unstable presentation was constructed. Results: Of the 273 pts, 109 (39.9%) had unstable presentation (unstable angina (89, 32.9%), NSTEMI (16, 7.5%), STEMI (4, 6.8%). In univariate analyses, history of prior MI was a strong predictor of unstable presentation (OR 2.11, 95% CI 1.19–3.74, p = 0.01). In the multivariate model, however, prior MI (OR 1.93, 95%CI 1.07–3.45, p = 0.026) was the only factor associated with unstable presentation, while Mehran class IV ISR (OR 2.45, 95%CI 1.06–5.78) and DM (OR 1.61, 95%CI 0.90–2.90, p = 0.12) trended towards clinical significance. The differences between LDR (mean ±/−SD) in stable CAD (5.98 ±/−3.3) vs ACS (5.91 ±/−3.36) vs STEMI (8.56 ±/−7.5) groups were as follows: stable CAD vs ACS (p = NS), ACS vs STEMI (p = 0.07), stable CAD vs STEMI (p = 0.05). Conclusions: A strong trend towards association between complexity of BMS ISR and unstable presentation was noted. LDR > 6 was associated with STEMI presentation whereas LDR< /− 6 was associated with NSTEMI-ACS or stable angina presentation. LDR may hold significant predictive value for ISR complexity and presentation acuity.
associated with PCAD, dyslipidemia conferring the strongest risk. Presence of multiple CRFs conferred incremental risk underscoring the importance of aggressive risk assessment/ modification in these patients.

Therapeutic Dose Assessment of Patients Switching From Atorvastatin to Simvastatin


Objective: Patient switching of prescription drug brands within therapeutic class has become more prevalent with tiered drug plan formularies. While switching from more expensive brand name drugs to generic equivalents may reduce aggregate prescription costs, therapeutic benefit may be compromised if the patient is not switched to a drug with an equivalent therapeutic profile. This study examined whether patients switching from branded atorvastatin to either a brand or generic simvastatin were prescribed a therapeutically equivalent or higher dose. Methods: Study patients were selected from a national longitudinal database of 1.3 billion annual prescription drug claims. All patients active in the database during the study period (9/01/2005 to 9/30/2006) with a prescription drug claim for atorvastatin in the index month of the study period were selected. The 453,409 patients in the study period were followed for 12 months to determine the percent switching to simvastatin and their relative therapeutic dose after switching. Patients switching to the same or lower mg dose of simvastatin were classified as receiving a lower therapeutic dose compared to their atorvastatin dosing. Results: Among patients using atorvastatin at the beginning of the study, 13,505 (3%) switched to simvastatin by the end of the study period. Medication changes resulted in a lower therapeutic dose in 38% of the switches. The percent of switches resulting in a lower therapeutic dose were 18% for those switching from 10mg, 43% for those switching from 20mg, 73% for those switching from 40mg, and 100% for those switching from 80mg. Conclusions: A significant proportion of patients switching from atorvastatin to simvastatin received a lower therapeutic dose, which may have an adverse impact on patient’s quality of care and health status. Further research is needed to assess the potential negative affect on patient outcomes.

Long-Term Outcomes in Hospitalization for Acute Decompensated Heart Failure in Patients Managed by a Multi-Disciplinary Heart Failure Clinic Compared to a General Cardiology Clinic

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Background: Previous studies have shown heart failure patients treated by a cardiologist have improved outcomes when compared to patients managed by a primary care physician. The current study evaluates the long-term outcomes in patients managed in a multi-disciplinary heart failure clinic using a disease management model compared to patients treated by a general cardiologist. Methods: A retrospective chart review was done on 191 heart failure clinic patients (HF) and 116 general cardiology clinic patients (GC). All patients had symptomatic heart failure with a left ventricular ejection fraction of <55%. In addition to a cardiologist, HF patients were seen by a nurse practitioner and clinical pharmacist. Hospitalization data was collected for acute exacerbation of heart failure. A comparison was made of patient’s age, gender, race, and co-morbid illnesses (Table 1). Statistical analyses included descriptive statistics and two sample T-testing. Results: HF patients had a significant decrease in hospitalization for acute heart failure. Average hospitalizations per patient for 1 year was 0.22 (HF) versus 0.46 (GC) (p-value 0.0274) and for 5 years (per patient/year) was 0.21 (HF) versus 0.38 (GC) (p-value 0.03). This corresponds to a 60% rehospitalization rate of 2-1:1 (1 yr) and 1:8:1 (5 year). Conclusions: Patients managed in a multi-disciplinary heart failure clinic are less likely to be hospitalized for acute heart failure than those managed by a general cardiologist. The impact of disease management strategies on mortality will be the focus of further studies. Table 1: Comparison of Heart Failure Clinic and General Cardiology Clinic Patients

Balance and Falls in People With Stroke Living in the Community: Do Generic or Stroke-Specific Clinical Measures Better Relate to Falls History?

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Falls is a major problem for people in the community with stroke with incidence rates as high as 73%. The objective was to compare the ability of 2 self report instruments, the Stroke Impact Scale (SIS) and the Activities-related Balance Confidence scale (ABC) with performance-based measures of the Berg Balance scale (BBS) and the lower
Exposure to Fugl-Meyer (FM) score in identifying people with stroke who had a history of multiple falls as compared with those who did not. We also sought to determine if stroke-specific tools (SIS-16 and FM) were better for this purpose than general tools (ABC, BBS, and SIS-16) at predicting falls. The non-fall cohort included all study participants, while the fall cohort included those who reported one or more falls. The study concluded that stroke-specific tools may be more effective in identifying falls in people with stroke compared to general tools.}

**What Gender Differences Persist in Treatment of Acute Coronary Syndromes?**

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Purpose: Acute coronary syndrome (ACS) patients are known to be older, more comorbid, receive later and less aggressive therapy, have higher mortality rates than women. Current outcomes, treatment and results in ACS pts in the Cardiac Care Unit (CCU) and Cath Lab (CCL) are assessed to see whether intensive education has changed these gender differences.

Methods: ACS pts in 2004 and 2005 in the CCL were grouped as unstable angina (UA), non-STEMI, STEM1 and analyzed for differences in demographics, comorbidity, therapy, and outcome (CVA, Renal Insufficiency [CRI], AMI, emergent PCI or cardiac surgery, and mortality). CCI pts were similarly analyzed, plus TIMI score, therapy, DR status. Chi square or t testing was performed as appropriate with p ≤ 0.05.

Results: During 2004 and 2005 women had 35% of 7,248 Caths for ACS. 43.8% F vs 57.3% M had significant CAD (p < 0.001) at Cath. Women had 29.0% of 1,491 PCI pts for ACS (STEMI n = 345 [23.2% F], non-STEMI n = 737 [30.6% F]; UA n = 769 [29.9% F]). Women were older (62 vs 56.8 yrs), TIMI 54: 84 yrs non-STEMI. 66.5 vs 62.4 yrs UA; mean 64.9 vs 60.0 yrs; p < 0.05), with more DM (33.0 vs 21.7%; p < 0.001), PVD (11.1 vs 6.6%; p < 0.05), CHF (17.8 vs 12.5%; p < 0.05). Men received more GP IIb/IIIa inhibitors for stem1 or non-STEMI (77.2 vs 64.5%; p < 0.01) and less bailorulin for non-STEMI (21.8 as 32.8%; p < 0.015). In ACS, UA was similar (9.9 vs 12.4 yrs; 89.3 F vs 86.4 M); PCI mortality was similar (STEMI 1.6% F v 1.9% M), non-STEMI (1.7 F v 0.8% M); UA (0% F v 0.7% M); overall 1.4% v 1.0% p < NS. Aggregate and individual complications were similar. There were 39 CCL DNR pts (21F 18M) with similar ages (77.0 F v 76.9 M yrs; TIMI Scores (4.2 F v 3.9 M) and admit date to DNR (7.4 F v 7.6 M days); STAR was made by pt (23.8 F v 50.0 M); spouse (29.6 F v 22.2 M), or children (47.6 F v 27.8 M): all p < NS. Aggressive management (PC) was similar in men and women with DNR (50% M v 38% F; p < NS). Conclusions: Aggressive revascularization is the therapy of choice for ACS. Current outcomes, referrals, and therapy do not reflect a substantial gender bias; comparable outcomes are seen in women despite more unfavorable risk factors (age, DM, CHF, CRI, PVD) and therapy differences (GP IIb/IIIa) use favoring outcomes for men.
Combining Hospital Rankings Across Three Major Areas of Cardiac Care: Can Any Hospital Be in the Top Outcomes Quartile for All Services?

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Objective: The objective of this research was to determine if any hospitals can excel in three major areas of cardiac care (AMI, PCI, and CABG) and to report risk-adjusted mortality rates by performance class. Methods: A retrospective analysis was conducted using the MedPar Files for fiscal year 2005. The study sample consists of 797 US hospitals treating at least 52 Medicare beneficiaries (MB) in each of the following: AMI, PCI, and CABG during the fiscal year. Separate logistic regression equations (controlling for up to 25 demographic and co-morbid conditions) were estimated to predict each MB’s probability of experiencing in-hospital mortality for each type of hospitalization. For each type of hospitalization, hospitals were ranked into quintiles from best to worst based on the number of lives saved (or lost); the difference between a hospital’s risk-adjusted expected number of deaths and its observed number of deaths. Hospitals were then classified into 5 categories based on their quartile ranking across the three types of hospitalizations. Class 1 - top quintile in all three; Class 2 - average quintile ranking between 1 and 2; Class 3 - average quintile ranking between 2 and 3; Class 4 - average quintile ranking between 3 and 4; and Class 5 bottom quintile in all three. Findings: Overall, 37 hospitals were in the top quintile in all three rankings while 34 hospitals were in the bottom quintile in all three rankings. The table reports the average risk-adjusted mortality rates for each type of hospitalization by performance class. Class 1 hospitals had significantly (p < 0.01) lower average mortality rates for all three types of hospitalizations than the average mortality rate for hospitals in any of the other classes, except for CABG (p = 0.03) and PCI (p = 0.45) between Class 1 and Class 2 hospitals. Conclusion: Out of 797 hospitals only 37 performed well in all three areas examined. It’s relatively rare for a hospital to be in the top quintile in multiple areas of cardiovascular care.

Average Risk Adjusted Mortality Rates by Hospital Performance Class

<table>
<thead>
<tr>
<th>Class</th>
<th>Hospitals</th>
<th>AMI</th>
<th>CABG</th>
<th>PCI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 1</td>
<td>37</td>
<td>6.00%</td>
<td>1.21%</td>
<td>0.71%</td>
</tr>
<tr>
<td>Class 2</td>
<td>134</td>
<td>7.15%</td>
<td>1.68%</td>
<td>0.77%</td>
</tr>
<tr>
<td>Class 3</td>
<td>321</td>
<td>9.83%</td>
<td>2.97%</td>
<td>1.27%</td>
</tr>
<tr>
<td>Class 4</td>
<td>246</td>
<td>11.18%</td>
<td>4.53%</td>
<td>1.99%</td>
</tr>
<tr>
<td>Class 5</td>
<td>34</td>
<td>12.96%</td>
<td>5.32%</td>
<td>2.37%</td>
</tr>
</tbody>
</table>

Validation of the Kansas City Cardiomyopathy Questionnaire in Taiwan

Hsing-Mei Chen, Angela P Clark, The Univ of Texas at Austin, Austin, TX; Liang-Min Tsai, National Cheng Kung Univ Hosp, Tainan, Taiwan; Yann-Fen C Chao, National Yang-Ming Univ, Taipei, Taiwan; John Spterus; Univ of Missouri-Kansas City and Mid America Heart Institute of Saint Luke’s Hosp, Kansas City, MO

Background: As patient-centered outcomes, including health status, assume a more prominent role in evaluating treatment efficacy and quality of care, it is increasingly important to have culturally and linguistically valid translations available. We sought to develop and test the reliability and validity of a Chinese-Mandarin version of the Kansas City Cardiomyopathy Questionnaire (KCCQ) in Taiwanese people with heart failure. Method: In translating the KCCQ into Chinese-Mandarin, and to achieve cultural equivalence, we conducted serial forward and backward translations and included parenthetical terms used by Taiwanese to facilitate interpretability. To examine the validity and reliability of the translation, participants were recruited from the outpatient department of a large medical center in southern Taiwan. They completed a baseline KCCQ and a retest 2 to 3 weeks later. Construct validity was assessed using Medical Outcome Study Short Form-36 (SF-36) and NYHA functional classification. A two-sample method was employed to test the discriminant validity of KCCQ using NYHA classes (I-IV) and SF-36. Results: Among 86 participants (27 female and 38 male) who were enrolled, 55 participated in the retest. Mean age was 65.5 ± 13 years and the mean number of comorbid conditions was 4.95. All NYHA Classes were represented. Cronbach’s alpha for internal consistency reliabilities of the subscales ranged from .67 (self-efficacy) to .89 (overall summary score). Except for self-efficacy (r = 0.25), the remaining domains had acceptable reproducibility (r ≥ 0.43). Convergent and divergent validity were achieved. The subscales had significant associations with SF-36 domains (r = .31–.80). Using
trend analysis, relevant subscales were significantly correlated with NYHA Classes (r = -0.49 [95% CI] to -0.59 [overall summary score], p < 0.001 for all). Likewise, mean scores of the KCCQ appear to be valid and reliable. It can serve as a clinically meaningful outcome measure in heart failure research in Taiwan.

Cost-Effectiveness of Multi-Drug Regimen of Amlodipine + Atorvastatin Based on the Anglo-Scandinavian Cardiac Outcomes Trial (ASCOT): An Economic Sub-Analysis


Background: ASCOT was a 2x2 factorial study comparing atenolol-based (AT) and amlodipine-based (AM) regimens in hypertensive patients with ≥3 additional cardiovascular risk factors. Of 19,342 total patients, 10,305 with cholesterol levels ≤<6.5 mmol/L were also randomized to atorvastatin (A) 10 mg daily or placebo (P). Methods: We assessed the cost-effectiveness of the four treatments in ASCOT, in a US setting, based on clinical outcomes during the trial median (median 3.3 years) and then applying a life-time Markov model constructed to predict the long-term effects of treatment on first CV events. All patients were assumed to have active treatment for 3 years then drug consumption observed in the AT + P arm for the remaining years. Costs included study drug, hospitalization, diagnostic procedures, and co-payments were estimated, based on diagnosis-related group charges with weightings from US MEDPAR databases and using wholesale costs of single-pill AM/AT. The measure of effectiveness was the total number of cardiovascular events and procedures. The main predicted model outcomes were life years gained (LYG) and quality-adjusted life years (QALY) gained. Of discrimination and calibration. Contrary to the other tested models, the logistic EuroSCORE performance parameters achieve acceptable accuracy, predictive power and ability to rank hospital performances. The Italian CABG model, which is more parsimonious and with a better overall fit, may provide a practical solution in managing CV risk with improved patient adherence in the long-term.

Total mean cost per patient (USD) Mean number of events and procedures per patient Quality-adjusted life years (QALY) gained

<table>
<thead>
<tr>
<th>Model</th>
<th>Total mean cost per patient (USD)</th>
<th>Mean number of events and procedures per patient</th>
<th>Quality-adjusted life years (QALY) gained</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atenolol-based regimen</td>
<td>9,052 (8,283–9,820)</td>
<td>0.14 (0.124–0.164)</td>
<td>9.54</td>
</tr>
<tr>
<td>Amlodipine-based regimen</td>
<td>11,157 (10,302–11,977)</td>
<td>0.12 (0.104–0.137)</td>
<td>9.56</td>
</tr>
<tr>
<td>Placebo (P)</td>
<td>10,777 (10,026–11,101)</td>
<td>0.11 (0.094–0.127)</td>
<td>9.58</td>
</tr>
<tr>
<td>Atenolol-based regimen + atorvastatin (AT + A)</td>
<td>9,052 (8,283–9,820)</td>
<td>0.14 (0.124–0.164)</td>
<td>9.54</td>
</tr>
<tr>
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<td>9.58</td>
</tr>
</tbody>
</table>

Conclusions: The AM + A regimen was the most effective at reducing cardiovascular events and procedures (P < 0.0001); while AT + P was the cheapest regimen. AM + P was more costly and less effective than AT + A or AM + A as our model results showed. The costs of AM were assumed to be equal with AT.

Empirically Derived or Pre-Existing Model in the Evaluation of Hospital Quality in the Coronary Artery Bypass Graft Surgery (CABG) Procedure

Stefano Rosato, Paola D’Errico, Fulvia Secareccia, Valero Manno, Gabriella Badoni, Istituto Superiore di Sanità, Rome, Italy; Danilo Fusco, Carlo A Perucci; ASL RM Supramonte di San Pietro, Sassari, Italy; F. Passerini, A. Della Bella, University of Rome Tor Vergata, Italy; L. Nesti, B. Peruchi, University of Genoa, Italy; B. Vanni, M. Gargiulo, University of Palermo, Italy; A. Porzi, University of Turin, Italy

Background: Hospital and procedure quality are crucial for CABG patient outcomes. Our study examines and provides a practical solution to improving CABG quality of care.

Methods: Patients undergoing CABG from 2003 to 2005 were identified from the National Health Insurance System (INS). The sample was limited to patients with a diagnosis of acute coronary syndrome, and the analysis was performed at the hospital level (n = 2,282,710 patients). The outcome measure was the rate of in-hospital mortality. Covariates included intrahospital complications and preoperative characteristics.

Results: The independent predictors of mortality at the hospital level were the institutions’ location (north vs. south), patient age, diabetes, hypertension, previous CABG, preoperative ejection fraction, and previous PCI. The results also showed a significant reduction in hospital mortality over time. The results of the study suggest that patient outcomes can be improved by focusing on hospital-level factors and by implementing quality improvement strategies.

Conclusions: This study highlights the importance of hospital-level factors in determining CABG outcomes and provides evidence for the need to target hospital-level interventions to improve CABG quality of care.

Outcome of Heart Failure in the Community

Danelle M Henkel, Margaret M Redfield, Susan A Weston, Véronique L Roger; Mayo Clinic, Rochester, MN

Background: Heart failure (HF) is common but heterogeneous as it can present with preserved or reduced ejection fraction (EF). Mortality in HF is high but little is known about causes of death in HF and how it may differ by EF. We examined the causes and predictors of death according to EF in the community. Methods: Olmsted County residents with HF defined by Framingham criteria were identified. HF was classified as preserved (EF ≥50%) or reduced EF (EF <50%). Mean ± SD follow-up was 5.2 ± 4.2 years. Deaths were classified by the International Classification of Disease as coronary heart disease (CHD), other cardiovascular and non-cardiovascular deaths. Results: Between 1979–1999, 867 persons with HF were identified; 57% with preserved EF. CHD was less severe in subjects with preserved vs reduced EF (21% vs 48% respectively p = 0.0001). The 5-year survival was 45% (95% CI 42%–48%). After adjustment for age, sex, and comorbidity, subjects with preserved EF had lower risk of death than when EF was reduced (HR 0.77; 95% CI 0.68–0.86). The leading cause of death for subjects with preserved EF was non-CHD (45%) vs CHD in those with reduced EF (44% (p = 0.051). Age, comorbidity, and reduced renal function were associated with increased risk of death independent of EF. Conclusion: In the community, morbidity and cause of death in HF differed by EF. Severe comorbidity is less common in subjects with preserved EF who experience better survival and die most often of non-cardiovascular deaths while CHD predominates in those with reduced EF.

Cause of Death

<table>
<thead>
<tr>
<th>Cause of Death</th>
<th>CHD</th>
<th>Other cardiovascular</th>
<th>Non-cardiovascular</th>
<th>Chi-square p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>EF = &lt;50%</td>
<td>48%</td>
<td>20%</td>
<td>32%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>EF = &gt;50%</td>
<td>24%</td>
<td>20%</td>
<td>33%</td>
<td></td>
</tr>
</tbody>
</table>

Adherence to the Waiting Period Recommendation in Acute Coronary Syndrome Patients Who Receive Clopidogrel and Undergo Same-Day Coronary Artery Bypass Graft Surgery

Jay P Bae, Eli Lilly and Company, Indianapolis, IN; Kia Powell-Threets, Thomson Medstat, Rochester, MN

Background: Acute coronary syndrome (ACS) patients often receive a dose of clopidogrel prior to examination of the coronary anatomy. If CABG is the appropriate intervention following examination, the ACC/AHA guideline recommends pre-operative clopidogrel administration. This study examined adherence to this guideline in clinical practice and potential economic costs of clopidogrel-related delays in surgery. Methods: This retrospective study used a large nationwide inpatient database (Safeguard ACDR) from US hospitals to identify patients who underwent PCI between 1/1/03 to 3/1/05. Of 17,113 patients, 3,301 patients from 29 hospitals had an ACS diagnosis and same-day CABG. Of interest were the 22,634 patients (11.5%) who received clopidogrel before CABG. Financial impact of guideline adherence was simulated using marginal cost of CABG stay estimated from the reported cost data element in the database. Results: The minimum patient waiting period was adhered to in 16.9% (5,809 of 22,634) patients. Percentage of patients undergoing CABG was 14.6% on the same day of clopidogrel first dose, 26.9% in...
Lipid Management and LDL-C Goal Attainment in Clinical Practice in Malaysia

Rebaayah Zambahari, Nat’l Heart Inst, Kuala Lumpur, Malaysia; Qaoyi Zhang, Evo Aleman, Don Yin; Merck and Co., Whitehouse Station, NJ

Objective: Evaluate lipid management in clinical practice in Malaysia and assess factors associated with NCEP ATP-III cholesterol goal attainment. Methods: Retrospective chart review of patients from 3 cities in Malaysia. Sixty randomly selected physicians identified patients based on pre specified randomization criteria. Of those selected, 344 patients, aged 18–75 yrs and newly initiated on statin monotherapy met inclusion criteria. Physician reviewed patient’s chart and extracted data on cardiovascular risk factors, lipid measurements, prescription drugs and practice conditions to determine initiation (baseline), medical and dietary changes, total lipid levels and statin prescriptions up to a minimum 1 year following initial statin (follow-up). Results: Among 344 patients, 55% patients were CHD/CHD equivalent, 45% non-CHD with mean age of 54 yrs (SD 9.0), 64.2% were males and 36.3% diabetics. Average lipid profile of patients at baseline were; LDL-C 142.3mg/dl (SD 37.7), TC 229.6mg/dl (SD 46.3), TG 179.8mg/dl (SD 78.6), HDL-C 51mg/dl (SD 15.1). Simvastatin 10mg and 20mg or equivalent statins were most commonly prescribed statins (80.5%), followed by simvastatin 40mg and above equivalent statins (16%). Few patients (2.3%) discontinued statin therapy during follow-up and only 4.7% of the patients switched to another statin. Overall 54.4% and 36.5% in the CHD/CHD equivalent group attained NCEP ATP-III LDL-C goal and only 6.7% of CHD/CHD patients attained alternative recommended LDL-C goal of 70mg/dl. Among patients who were not at goal, the average LDL-C level was 132.9mg/dl (SD 25.5) and 65.6% of them required a greater than 10% reduction to attain NCEP ATP-III goal. Baseline LDL-C (OR 0.983; 95% CI 0.975–0.991), risk category of CHD/CHD equivalent (OR 0.65; 95% CI 0.31–1.39), and up-titration of statin (OR 10.0; 95% CI 2.1–49.0) were significant predictors of goal attainment. Conclusions: Even after a year on statin monotherapy, approximately 46% overall (63% of CHD/CHD equivalent patients) failed to attain goal, and about two third of patients who were not at goal required additional 10% or more LDL-C reduction to attain goal. More efficacious and well-tolerated lipid-modifying therapies are needed to enable these patients to get to goal.
fatigue with those who did not have fatigue at 3 weeks after surgery, on functioning (psychosocial and physical) and physical activity in the early recovery period (6-weeks and 3-months) after hospital discharge. **Design:** The design of this study was a prospective, comparative design. Subjects: This study represented those subjects who were randomized to the control group of a larger, parent study. **Sample:** Subjects (N=119) were dichotomized into two groups: (n=68) and non-fatigued (n=51) groups based on their 3-week self-report of the presence of postoperative fatigue. **Results:** At 6-weeks after surgery, fatigue subjects had significantly (p<0.05) more psychosocial functioning impairment, [role-emotional (t1.9), social (t2.6), and mental (t1.9)] functioning, based Medical outcome study short form-36 (MOS SF-36) means. They also had significantly (p<0.005) higher anxiety (t=3.6) and depression (t=2.9), based on mean Hospital anxiety and depression scale (HADS) subscale scores. Physiological functioning was significantly (p<.01) impaired at 6-weeks (Role physical (t=2.4) and vitality (t=2.3) functioning). Anxiety (t=2.3) and vitality functioning (t=2.3) remained significantly (p<.05) impaired at 3-months. **Conclusions:** Persistent fatigue can hamper early recovery outcomes following CABG surgery. Interventions tailored to address the management of fatigue, which persists following CABG surgery, are needed to improve patient outcomes.

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**The Effects of a Symptom Management Intervention on Symptom Evaluation and Physical Functioning for Women After Coronary Artery Bypass Surgery**

Lani Zimmerman, Susan Barnason, Paula Schultz, Janet Nieuwen, Univ Nebraska Med Ctr, Lincoln, NE; Connie Miller, Univ Nebraska Med Ctr, Omaha, NE; Melody Hertzog, Doris Rasmussen, Chunhua Tu; Univ Nebraska Med Ctr, Lincoln, NE

**Background:** Women have different needs for symptom management in the early postoperative recovery period. Gender differences in coronary artery bypass graft (CABG) recovery have been reported for symptom relief and general recovery outcomes. **Objective:** The major purpose of this subset of a larger parent study was to examine the effects of a symptom management intervention on post-operative symptoms (cardiac symptom scale) and physical activity scores (RT3 accelerator and diary) in women (65 and older) who had undergone CABG surgery in the early recovery period (3 and 6 weeks and 3 months) after surgery. **Methods:** This study was a randomized, 2-group, repeated measures experimental design. The symptom management intervention delivered over a 6 week period used a teledhealth device called the Health Buddy. A subsample of 40 women participants who were part of a larger study with 265 participants were used for these analyses. There were 23 women who had received the intervention and 17 who were assigned to the routine care group. **Results:** Wilcoxon rank-sum test showed that fatigue scores at 6 weeks were significantly different (z = 1.96, p = 0.05) for women who received the intervention (M = 96) compared to the control group (M = 2.47). Wilcoxon rank-sum test showed that fatigue scores at 3 weeks were significantly different (z = 1.89, p = 0.03) for women who received the intervention (M = 2.93) compared to the control group (M = 4.56). Other symptoms (e.g. depression, sleep) showed lower scores for the intervention group but were not statistically significant. In addition, physical activity scores at 3 months were higher for the intervention group (z = -1.71, p < .05). **Conclusions:** Findings from this study indicate the need to refine the current intervention and modify it to focus on reducing fatigue and increasing physical activity in women who are having cardiac surgery for a large randomized clinical trial.

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**Lipid Management and LDL-C Goal Attainment in Clinical Practice in Thailand**

Chaicharn Deerochanawong, Rajavithi Hosp, College of Medicine, Rangsit Univ, Bangkok, Thailand; Tami Wisniewski, St John’s Univ, New York, NY; Christine Wittkowski, Jacqueline S McAninch, Carol A Trapp, Mary J Lutz, Michael J O’Donnell; Michigan Heart P.C., Ann Arbor, MI; St. Josep Mercy Hosp, Ann Arbor, MI; Michael J O’Donnell, Michigan Heart P.C., Ann Arbor, MI

**Background:** ACC/AHA guidelines recommend performing primary percutaneous coronary intervention (PCI) on patients with ST-segment elevation myocardial infarction (STEMI) within 90 minutes (min) of hospital arrival. Baseline data revealed 132 STEMI patients presenting directly to the Emergency Department (ED) at a community hospital. Data analysis of door-to-balloon (D2B) time for these patients documented a mean time of 98 mins with a median time of 91 mins and 50% of patients had a reperfusion <90 mins. **Methods:** A multidisciplinary task force comprised of leadership from the ED, Cath Lab, and Quality Department developed strategies to improve D2B reperfusion times with a target of <90 mins for 80% of STEMI patients. The baseline process consisted of sequential steps starting at arrival in the ED and ending with reperfusion in the CL. A new process was implemented that provided for rapid simultaneous steps including 1) a very rapid first ECG and diagnosis in the ED of patients arriving by private auto, 2) activation of the CL team via a gate page triggered by a positive pre-hospital ECG and hospital first ECG, 3) use of on-site staff to open applicable the CL during off-hours, 4) transfer of the patient to the CL without additional communications, 5) and a rapid response from the CL team. Notes and time intervals are recorded on a special ED and CL Primary PCI Checklist that is used to review each case, identifying opportunities for further improvement, monitoring the success of the project. The baseline sample of 132 cases was from the time period of January 1, 2005 through June 20, 2006. The post sample consisted of 27 cases from September 6, 2006 through January 22, 2007. Two-sample T-Tests were used to assess the improvement in the D2B mean times and the proportion of cases ≤90 mins. The D2B time improved from 117 mins in the intervention group to 91 mins from 98 to 70 mins, 95% CI, p = .0001, median times from 91 to 68 mins, 95% CI, p = .0001, and percent reperfusion ≤90 mins increasing from 50% to 85%, 95% CI, p = .001. **Conclusions:** D2B times were dramatically improved through a collaborative multidisciplinary quality improvement process that utilized data driven decision making for rapid and simultaneous implementation of evaluation, activation, and reperfusion.

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**Assessing Adequacy of Blood Glucose Control in Patients With Acute Coronary Syndromes Admitted to a Community-Based Teaching Hospital**

Ashwini Gore, Sagar Panse, Doron Schneider, Emanuel Rosenberg; Abington Memorial Hospital, Abington, PA

**Background** Recent data suggests that hyperglycemia (blood glucose >110 mg/dl) at the time of an acute coronary syndrome is associated with increased morbidity and mortality regardless of diabetes status. The 2004 ACC/AHA guidelines on STEMI, that could be applicable to NSTEMI recommend the use of an insulin infusion to normalize blood glucose in patients with or without diabetes (class I recommendation for STEMI with complicated course and class IIa for any STEMI with hyperglycemia). **Methods** We conducted a retrospective chart review of a randomly selected group of patients admitted to a teaching hospital with the diagnosis of an acute coronary syndrome (STEMI or NSTEMI) during the year 2005. Plasma glucose and finger-stick glucose data was recorded for the first 3 days since admission. The effect of hyperglycemia (HG) on the length of stay, in-hospital mortality as well as other outcomes such as acute congestive heart failure, renal failure, infection, sepsis and readmission within 1 year was determined. **Results** Out of 110 charts that were studied, 86 patients (78.18%) were noted to have hyperglycemia (26 known diabetics, 60 without diabetes history). Only 28 out of these 86 patients (32.56%) had acceuchords to order their blood glucose levels. Out of the 26 diabetics in the group, 19 patients were treated with oral hypoglycemics and a sliding scale while 7 received sliding scale alone. Two out of the 60 (3.33%) nondiabetics with HG were treated and only with a sliding scale. None of the patients with HG were treated with intravenous insulin. The HG group experienced a significantly higher rate (p<0.035) of adverse outcomes as compared to the non-HG group (composite of LOS>5days, acute CHF, ARF, and in hospital death or readmission within 1 yr). **Conclusions** Recognition and appropriate treatment of hyperglycemia was suboptimal. Hyperglycemia was associated with negative outcomes as noted in earlier studies. Increasing awareness of the association of hyperglycemia in acute coronary syndromes with adverse outcomes is essential. Systems changes and development of innovative strategies for implementation of intravenous insulin protocol will be required to close the gap between available guidelines and clinical practice.

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**Improving Door-to-Ballooon Time For Patients Presenting With An ST-Segment Elevation Myocardial Infarction Through Rapid and Simultaneous Implementation of Evaluation, Activation, and Reperfusion**

Cecelia K Montoye, St. Joseph Mercy Hosp, Ann Arbor, MI; Bradley L Hubbard, Michigan Heart P.C., Ann Arbor, MI; Michael G Maziak, Christopher H. Patton, Mary J Lutz, Christine Wittkowski, Jacqueline S McAninch, Carol A Trapp, Mary J Lutz, St. Josep Mercy Hosp, Ann Arbor, MI; Michael J O’Donnell; Michigan Heart P.C., Ann Arbor, MI

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improves to the average female RMR; and 3) the female RMR in bottom tier hospitals improves to the female RMR in top tier hospitals. For each scenario, the expected number of female deaths avoided in bottom tier hospitals is calculated using the expected female RMR in current practice versus the scenarios. Findings: The table reports the expected number female deaths in bottom tier hospitals in current practice and the expected number avoided under the three scenarios. The table indicates that as may as 1,650 (65.2%) of the 1,934 expected female deaths in current practice could have been avoided in bottom tier hospitals. Conclusion: Approximately 42% of female MB’s deaths in bottom tier CABG hospitals could be avoided if those hospitals improved their female RMR to the overall average female RMR: an achievable benchmark for these hospitals.

### Medication Adherence Following Coronary Artery Bypass Graft Surgery: Assessment of Beliefs and Attitudes

Kevin A Townsend, Pfizer Inc and Univ of Michigan, Ann Arbor, MI; Steven R Erickson, Richard L Prager, Kim A Eagle, Univ of Michigan, Ann Arbor, MI; Jon Vlasnik, Pfizer Inc, Cranberry, PA; Ujjaini Khanderia; Univ of Michigan, Ann Arbor, MI

The medication management of patients following CABG may include anti-platelet agents, beta-blockers, ACE inhibitors, and statins. However, poor adherence is common, and data suggest patient attitudes and beliefs play a role. This study evaluated the association between self-reported adherence and the beliefs and attitudes patients have about cardiovascular medications used after CABG. Adults 6 to 24 months removed from CABG were surveyed following IRB approval. The validated Beliefs About Medicines Questionnaire (BMQ) was used to assess attitudes concerning Specific Needs, General Overuse, Concerns, General Harm, and General Overuse of medicines. The validated medication adherence scale (MAS) was used to assess self-reported adherence. Analysis included Cochran’s coefficient alpha (internal survey reliability), univariate comparison (BMQ scales), and multivariate logistic regression (identification of adherence predictor variables). Of 367 patients surveyed, 132 (24%) completed the questionnaire. Non-participants were more likely to be female and have undergone 1- or 2-vessel CABG procedures as compared to 3- or 4-vessel procedures. Subjects were primarily English-speaking, Caucasian, and male. Adherent behavior was reported in 73 of 132 patients (55%). The average period between CABG and survey was 15 months. Internal reliability was good across all BMQ scales (Cronbach values 0.77 to 0.89). Non-adherent patients were in stronger agreement on the General Overuse (p = 0.01) and General Harm (p = 0.04) scales. Example items from these scales include: “If doctors had more time with patients, they would prescribe fewer medicines” and “Medicines do more harm than good.” Logistic regression results are presented in Table 1. In summary, patient beliefs and attitudes regarding medications along with other social, economic, and demographic factors help explain differences in self-reported adherence to standard medications following CABG.

### Using Risk-Adjusted Mortality Rates by Gender for Medicare Beneficiaries Undergoing Coronary Artery Bypass Graft Surgery to Estimate Percent of Female Death That Might Be Avoided by Improving Outcomes in Bottom-Tier Hospitals

Phillip P Brown, HCA CCMN, Nashville, TN; Aaron D Kugelmaess, Henry Ford Health System, Detroit, MI; April W Simon, Cardiac Data Solutions, Inc., Atlanta, GA; Steven D Culler; Emory Univ, Rollins Sch of Public Health, Atlanta, GA

Objective: The objective of this research is to identify the number of female Medicare beneficiaries (MB) deaths that could be avoided under three scenarios for improving women’s risk-adjusted mortality rates in bottom quartile hospitals performing CABG surgery. Methods: A retrospective analysis was conducted using the Medicare Provider Analysis and Review (MedPar) Files for fiscal year 2003 and 2004. The study sample consists of 802 hospitals in FY03 and 774 hospitals in FY04 that annually performed more than 52 CABG surgeries with at least 17 female patients. Multivariate logistic regression equations were estimated to predict each MB’s probability of experiencing in hospital death. Hospitals were ranked annually into quartiles based on the difference between a hospital’s risk-adjusted expected number of deaths and its observed number of deaths. Three scenarios for improving the female mortality rate in bottom tier hospitals were examined: 1) the female and male have the same risk-adjusted mortality rate (RMR) in bottom tier hospitals; 2) the female RMR in bottom tier hospitals.

### Medically Treated Transfer Patients With Acute Myocardial Infarction Have Higher In-Hospital Mortality Than Non-Transferred Patients


Background: Previous studies have found that patients with acute myocardial infarction (AMI) transferred to tertiary care centers have lower in-hospital mortality than non-transferred patients. However, patient subgroups may differ and such differences could have significant impact on the receiving hospital’s mortality data. We hypothesized that AMI transfer patients have higher in-hospital mortality when compared to non-transfer patients in a tertiary referral hospital. Methods: We conducted a retrospective cohort study using the administrative data collected for the University Healthsystem Consortium and Centers for Medicare & Medicaid Services (CMS) at Vanderbilt University Medical Center from 1/1/2002 to 6/30/2006. Patients were included if they had an AMI (ICD-9 121–123, 516, 526, 555, and 557; and primary discharge diagnosis of ICD-9 CM 410.x1). Patients were defined as medically-treated if they did not receive cardiac catheterization during hospitalization. The primary exposure among medically-treated patients was transfer versus non-transfer status. The primary outcome

### Table 1. Adjusted Odds of Patients Reporting Adherent Behaviors

<table>
<thead>
<tr>
<th>Covariate</th>
<th>OR</th>
<th>95% CI</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increasing Age</td>
<td>1.05</td>
<td>1.01 to 1.09</td>
<td>0.003</td>
</tr>
<tr>
<td>Gender Female</td>
<td>0.66</td>
<td>0.42 to 0.84</td>
<td>0.007</td>
</tr>
<tr>
<td>Increasing General Overuse Score</td>
<td>0.85</td>
<td>0.72 to 0.95</td>
<td>0.007</td>
</tr>
<tr>
<td>Living Status: Alone&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.36</td>
<td>0.14 to 0.91</td>
<td>0.001</td>
</tr>
</tbody>
</table>

<sup>a</sup> Reference: <sup>b</sup> Reference: With adult/te children

Using Risk-Adjusted Mortality Rates by Gender for Medicare Beneficiaries Undergoing Coronary Artery Bypass Graft Surgery to Estimate Percent of Female Death That Might Be Avoided by Improving Outcomes in Bottom-Tier Hospitals

<table>
<thead>
<tr>
<th>Identified barriers</th>
<th># of Clinicians (N=17)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost (e.g. insurance formulario, copayments, Part D Medicare, uninsured patients)</td>
<td>14</td>
</tr>
<tr>
<td>Polypharmacy</td>
<td>9</td>
</tr>
<tr>
<td>Real or perceived side effects</td>
<td>8</td>
</tr>
<tr>
<td>Lack of patient education regarding medications, dosage, duration</td>
<td>8</td>
</tr>
<tr>
<td>Patients’ beliefs about the need for medication (e.g. perception of being “cured” or</td>
<td></td>
</tr>
<tr>
<td>feeling better and not needing medication)</td>
<td>8</td>
</tr>
<tr>
<td>Medication reconciliation and hospital discharge confusion</td>
<td>7</td>
</tr>
<tr>
<td>Physician and patient confusion regarding prescription duration/duration</td>
<td>6</td>
</tr>
<tr>
<td>Poor patient - physician communication, transfer of care</td>
<td>6</td>
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<tr>
<td>Other (inclusion to take meds, cognitive impairment, low literacy, social support,</td>
<td></td>
</tr>
<tr>
<td>transportation)</td>
<td>5</td>
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</table>

94

95

96

97

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measured in in-hospital mortality. Secondary outcome measures were death within 48 hours and risk-adjusted mortality. Results: Among all patients, in-hospital mortality for transfer (n = 656) vs. non-transfer patients (n = 527) did not differ significantly (6.5% vs. 5.3%, p = 0.371). In the medically-treated group (n = 378), however, transfer patients (n = 181) had higher in-hospital mortality (17.7% vs. 9.2%, p = 0.016) than non-transfer patients (n = 193). Death within 48 hours was higher (12.1% vs. 4.1%, p = 0.004) in transfer versus non-transfer patients in this group. APR-DRG severity of illness and risk of mortality classes did not differ significantly between the groups. Risk-adjusted mortality was 23.7% for transfer patients and 7.3% for non-transfer patients in the medically-treated subgroup. Conclusions: We demonstrate that medically-treated AMI transfer patients have higher mortality and more early deaths than medically-treated non-transfer patients even after adjustment. In light of pay for performance, current risk-adjustment methods based on administrative data may not fully adjust for transfer status in medically-treated AMI patients.

Optimizing Cardiovascular Risk Reduction Pharmacotherapy in the Inpatient Diabetes Population

Michael Flisek, Joseph Cherian, Parag Patel; Advocate Lutheran General Hosp, Park Ridge, IL

Background: The 2004 United Kingdom Prospective Diabetes Study (UKPDS) and the American Diabetes Association (ADA) position statement mandate pharmacotherapy for cardiovascular disease risk reduction. Pharmacotherapy includes: HMGo-A reductase inhibitor (statin), Antiplatelet agents, and Angiotensin Converting Enzyme inhibitor/Angiotensin Receptor Blocker (ACE/ARB). This retrospective chart review evaluated risk reduction therapy in patients with diabetes on admission. Methods: We identified a sample included inpatients with a secondary diagnosis of diabetes from February through April of 2004 and 2006. Patients with known vascular disease were excluded. Computerized and manual chart audits were performed. Prescribed pharmacologic therapy upon admission and at discharge were outcomes measured. Results: 2058 patients were included in this review (830 in 2004 and 1228 in 2006). When comparing our data from 2004 to 2006, there was a doubling in our compliance with national guidelines (p < 0.01) upon admission and discharge. There was a trend (3–10%) towards increased pharmacotherapy compliance when comparing admission and discharge data within the same year. Conclusion: Compliance in prescibing cardiovascular risk reduction therapies for patients with diabetes improved upon admission from 2004 to 2006 but remains suboptimal. This analysis demonstrates the difficulty implementing national standard of care guidelines. Future analysis will include chart audits to examine specific reasons for noncompliance in meeting these guidelines.

Association of Serotonin Transporter Polymorphism (5-HTt) With Depression, Perceived Stress, and Norepinephrine in Patients With Chronic Coronary Heart Disease: The Heart and Soul Study

Mary Wholey, Sadia Ali, Univ of California, San Francisco, San Francisco, CA; Christian Ott; Univ Hosp Hamburg-Eppendorf, Hamburg, Germany

Background: The short allele of a polymorphism in the promoter region of the serotonin transporter gene (5-HTTLPR) interacts with stressful life events to predict depression in otherwise healthy individuals. Whether this allele increases the risk of depression associated with the stress of a chronic illness is unknown. Methods: We conducted a short allele carrier study in outpatients with coronary heart disease (CHD). Subjects completed a structured interview for depression, the Perceived Stress Scale, and a 24-hour urine collection. We used logistic regression to calculate odds ratios (OR) with 95% Confidence Intervals (CI) adjusted for age and gender. Results: Among participants carrying a short allele (SS or SL), 25% (97/383) had current (past month) depression, compared with 17% (29/174) of LH homozygotes (OR 1.6, 95% CI 1.0–2.6, p = 0.04) (Figure). Participants carrying a short allele had greater mean perceived stress scores compared with LH homozygotes (5.4 /+/- 3.4 vs. 4.7 /+/- 2.9, p = 0.02) (Figure) and a greater odds of high perceived stress (OR 1.6 /+/- 1.1–2.3, p = 0.02). Mean 24-hour urinary norepinephrine was higher in S allele carriers (55.6 /+/- 214.0 vs. 50.2 /+/- 23.8 µg/dL, p = 0.04) (Figure) who were also more likely to have norepinephrine values in the highest quartile (OR 1.7 /+/- 1.0–2.3, p = 0.05). Conclusions: Among patients with chronic CHD, carriers of the short allele of 5-HTTLPR are more vulnerable to depression, perceived stress and greater norepinephrine secretion. These factors may contribute to worse cardiovascular outcomes in these patients.

Dyslipidemia Treatment Patterns and Low-Density Lipoprotein Cholesterol Monitoring and Management of Patients With Atherosclerosis in Real-World Clinical Practice

Kathleen M Fox, Univ. of MD Sch of Medicine, Monckton, MD; Sanjay K Gandhi, James W Bussenius, AstraZeneca LP, Wilmington, DE; Roger L. Utter, AstraZeneca Cntr, College Station, TX; Susan Grandy, AstraZeneca LP, Wilmington, DE; Michael H Davidson; Radiant Rsch, Chicago, IL

Objective: Little is known about the lipid profile and associated treatment patterns of patients diagnosed with atherosclerosis. This investigation assessed the low-density lipoprotein cholesterol (LDL-C) levels and treatment patterns for dyslipidemia among atherosclerosis patients treated in routine clinical practice. Methods: This was a retrospective database study using a national outpatient electronic medical record database (GE Medical) and included patients with a diagnosis of coronary atherosclerosis (ICD-9 of 440.xx or 414.xx) between January 2004-2006 (n = 36,345). In addition to patient demographics, comorbid conditions, baseline LDL-C (closest value within six months of the diagnosis date), follow-up LDL-C (post diagnosis), use of dyslipidemia medications at the time of diagnosis and post diagnosis of atherosclerosis were recorded. Results: There were 36,345 eligible atherosclerosis patients with mean age of 68.3 years, 60% were male, 45% had hypertension and 29% were diabetic. A majority of patients (59%) were not on any dyslipidemia treatment at the time of diagnosis for dyslipidemia (4,769) and at discharge (12,721) of these patients were on a statin treatment at the time of atherosclerosis diagnosis and post atherosclerosis diagnosis, respectively. Approximately 40% of atherosclerosis patients (n = 14,418) did not have a baseline LDL-C estimate. Of the patients with LDL-C at diagnosis (n = 21,927), 25% of patients had LDL-C > 130 mg/dL, 53% had LDL-C > 100 mg/dL and 87% had LDL-C > 70 mg/dL at diagnosis. For patients with LDL-C > 100 mg/dL at diagnosis (n = 11,589), 58% of patients were not on statin treatment post diagnosis. Among patients with baseline and post LDL-C values (n = 15,510), 53% of patients had baseline LDL-C > 100 mg/dL. Among patients on statin or any other dyslipidemia therapy after diagnosis who had a baseline and follow-up LDL-C (n = 6,431), 89% had baseline LDL-C > 70 mg/dL whereas 82% had post diagnosis LDL-C > 70 mg/dL and 37% had post-diagnosis LDL-C > 100 mg/dL. Conclusions: The results from this study in routine clinical practice setting indicate the opportunities and need for better monitoring and managing lipid levels among atherosclerosis patients.

Hospital Factors Associated With Survival After Cardiac Arrest

Brendan G Carr, Lance B Becker, Roger A Band, Munish Goyal, David F Gaisberg, Benjamin S Abella, Robert W Neumar; Univ of Pennsylvania Sch of Medicine, Philadelphia, PA

Objectives: In several non-U.S. studies, survival rates of patients admitted after out-of-hospital cardiac arrest vary dramatically between hospitals within the same country and EMS system. Factors responsible for these mortality differences remain to be elucidated. We hypothesized that in the U.S., resources available in large metropolitan teaching hospitals might provide a survival advantage for these complex critically ill patients. Methods: Data from the 2004 National Inpatient Sample, a population-based 20% stratified sample of U.S. hospitals, was analyzed using Clinical Classifications Software to identify patients for whom “cardiac arrest and/or ventricular fibrillation” was the condition chiefly responsible for admission. The primary outcome variable was in-hospital mortality. Predictor variables included size of hospital (small, medium, large), location of hospital (metropolitan or non-metropolitan), and teaching status of hospital (teaching vs. non-teaching). Chi-square goodness of fit test was used to test for differences between groups. Results: We identified 16,182 patients discharged with the principle diagnosis of “cardiac arrest and/or ventricular fibrillation”. Overall in-hospital mortality was 51.5% (n = 8,348). Patients treated in teaching hospitals were less likely to die than patients treated in non-teaching hospitals (46% vs. 56%, p < 0.01). Patients treated in urban hospitals were less likely to die than patient treated in non-urban hospitals (50% vs. 60%, p < 0.01). Patients treated at large hospitals were significantly less likely to die (50%) relative to small (55% p < 0.01) and medium hospitals (55% p < 0.01). Conclusions: Hospital factors are associated with clinically significant outcome differences among patients admitted with principle diagnosis of cardiac arrest and/or ventricular fibrillation. Future research is needed to identify the specific factors causally related to lower mortality.

Preventive Aspirin Use Among Patients at Risk for Coronary Heart Disease: Suboptimal Use Among SHIELD Respondents

Sandra J Lewis, Northwestern Cardiovascular Institute, Portland, OR; Kathleen M Fox, Strategic Healthcare Solutions, Monckton, MD; Susan Grandy; AstraZeneca LP, Wilmington, DE

Objectives: We assessed aspirin use in a population at risk for coronary heart disease (CHD) to determine whether individuals adopted the AHA 2004 guidelines for cardiovascular disease prevention that recommend aspirin use for moderate and high risk individuals. Methods: Participants, >18 years, in the Study to Help Improve Early evaluation and management of lipid risk factors Leading to Diabetes (SHIELD), were classified based on National Cholesterol Education Program Adult Treatment Panel III risk categories. High risk was defined as patient-reported diagnosis of heart disease/heart attack, narrow or blocked arteries/carotid artery disease, stroke or diabetes; moderate risk included respondents with ≥2 risk factors, i.e. men ≥45 years, women ≥55 years, hypertension, low HDL-C, current smoking, and family history of
CHD; and low risk was defined as 0–1 risk factors. Participants reporting taking an aspirin most of the time or always in the past 4 weeks were classified as daily aspirin users. Aspirin use was adjusted for age, gender and race using logistic regression. Results: A significantly greater proportion of high-risk respondents (n = 7300) indicated daily aspirin use (64%) compared with moderate- (36%, n = 4695) and low-risk groups (12%, n = 5164), p < 0.0001. Yet, 45% of high-risk respondents were not taking daily aspirin. Among men, 61% of the high-risk group reported daily aspirin use versus 40% of moderate- and 16% of low-risk groups, p < 0.0001. For women, daily aspirin use was reported in 49% of high-, 33% of moderate- and 14% of low-risk groups, p < 0.0001. Regardless of risk level, fewer women were taking daily aspirin (33%) than men (44%, p < 0.001), but the disparity was greatest in the high-risk group. Compared with respondents at low risk, both moderate- and high-risk respondents were significantly more likely to take aspirin, after adjusting for age, gender and race (odds ratio [95% CI]: 1.8 [1.7–2.0] for moderate and 3.7 [3.3–4.1] for high risk). Conclusion: High-risk SHIELD respondents reported the highest rates of daily aspirin use; however, even within the high-risk group, there remains significant room for improved prevention. A large proportion of high risk subjects do not meet AHA recommendations for aspirin use.

Methods: We evaluated the association between clopidogrel use and mortality after drug-eluting stent (DES) or bare-metal stent (BMS) implantation for ACS. Background: This was a national cohort of VA patients with DES or BMS implantation for ACS from 2003–2004. Patients were categorized as being on versus off clopidogrel over the follow-up period based on pharmacy data. Multivariable Cox regression assessed the association between clopidogrel use (time-varying covariate) and all-cause mortality, adjusting for demographics, clinical history, hospital presentation and treatment variables. Median follow-up was 538 days. Results: Of 1,455 ACS patients, 65.8% received BMS and 34.2% received DES. BMS patients were more likely to have prior PCI, higher TIMI risk scores, and LV dysfunction. The median number of days of clopidogrel use was 299. Clopidogrel use was associated with better unadjusted survival versus being off clopidogrel. In multivariable analysis, clopidogrel use remained associated with lower mortality (HR 0.40; 95% CI 0.27–0.60). Findings were consistent for BMS (HR 0.36; 95% CI 0.21–0.60) or DES (HR 0.48; 95% CI 0.25–0.91). In secondary analysis, follow-up was divided into 6-month intervals. The benefit of clopidogrel use remained constant for at least 12 months after hospital discharge (0–6 months: HR 0.36; 95% CI 0.20–0.62) (7–12 months: HR 0.43; 95% CI 0.22–0.83) (13–18 months: HR 0.37; 95% CI 0.20–0.62). Conclusion: Extended clopidogrel use following stent implantation with BMS or DES for ACS is associated with improved survival. Clinical trials are needed to define optimal duration of clopidogrel therapy after stent implantation for ACS.

Emergency Department Visits for Stroke in the United States: National Hospital Ambulatory Medical Care Survey

Jipan Xie, Mary George, Ctrss for Disease Control and Prevention, Northrop Grumman, Atlanta, GA; Henryya McGruder, Jing Fang, Janet B Croft; Ctrss for Disease Control and Prevention, Atlanta, GA

Background: Emergency care is an essential part of acute stroke care. This study examined characteristics of emergency department (ED) visits with a first-listed diagnosis of stroke in the US. Methods: The National Hospital Ambulatory Medical Care Survey is a national survey of visits to emergency and outpatient departments of non-Federal, short-stay, and general hospitals in the United States. ED visits with a physician’s primary diagnosis of stroke (ICD-9-CM 430–434, 436–438) were included in the analysis. We examined characteristics of ED visits for stroke in 2003 and 2004, including chief complaints, waiting time and receipt of MRI/CAT. Results: Approximately 408,000 ED visits (9.4% of all ED visits) were related to a diagnosis of stroke each year. Among them, 10.2% were ischemic, 13.2% were hemorrhagic, 74.6% were ill-defined and 2.0% were late effects of stroke. Waiting time to see a physician was 35.1 (se 3.2) minutes. Among stroke ED visits, 39.5% arrived via ambulance and 44.1% were classified as urgent (should be seen <15 minutes). Older age and non-Metropolitan Statistical Areas (MSA) were related to longer waiting times while arrival via ambulance and urgent cases were associated with shorter waiting times (p < 0.05). MRI/CAT was used among 74.0% of stroke ED visits. Among stroke ED visits, 9.8% had a history of diabetes, 7.3% had a history of hypertension, 5.9% had a history of cancer, 5.6% had a history of CHD; and low risk was defined as 0–1 risk factors. Participants reporting taking an aspirin most of the time or always in the past 4 weeks were classified as daily aspirin users. Aspirin use was adjusted for age, gender and race using logistic regression. Results: A significantly greater proportion of high-risk respondents (n = 7300) indicated daily aspirin use (64%) compared with moderate- (36%, n = 4695) and low-risk groups (12%, n = 5164), p < 0.0001. Yet, 45% of high-risk respondents were not taking daily aspirin. Among men, 61% of the high-risk group reported daily aspirin use versus 40% of moderate- and 16% of low-risk groups, p < 0.0001. For women, daily aspirin use was reported in 49% of high-, 33% of moderate- and 14% of low-risk groups, p < 0.0001. Regardless of risk level, fewer women were taking daily aspirin (33%) than men (44%, p < 0.001), but the disparity was greatest in the high-risk group. Compared with respondents at low risk, both moderate- and high-risk respondents were significantly more likely to take aspirin, after adjusting for age, gender and race (odds ratio [95% CI]: 1.8 [1.7–2.0] for moderate and 3.7 [3.3–4.1] for high risk). Conclusion: High-risk SHIELD respondents reported the highest rates of daily aspirin use; however, even within the high-risk group, there remains significant room for improved prevention. A large proportion of high risk subjects do not meet AHA recommendations for aspirin use.

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The Impact of Clopidogrel Use on Long-Term Outcomes Following Stent Implantation for Acute Coronary Syndrome in the VHA

P. Michael Ho, Denver VA Med Ctr, Denver, CO; Stephan D Fihn, Li Wang, Chris L Bryson, Elliott Lowy, Charles Maynard, Puget Sound VA Healthcare System, Seattle, WA; David J Magid, Kaiser Permanente of Colorado, Denver, CO; Eric D Peterson, Duke Clinical Rsch Institute, Durham, NC; John S Rumsfeld; Denver VA Med Ctr, Denver, CO

Background: We evaluated the association between clopidogrel use and mortality after drug-eluting stent (DES) or bare-metal stent (BMS) implantation for ACS. Methods: This was a national cohort of VA patients with DES or BMS implantation for ACS from 2003–2004. Patients were categorized as being on versus off clopidogrel over the follow-up period based on pharmacy data. Multivariable Cox regression assessed the association between clopidogrel use (time-varying covariate) and all-cause mortality, adjusting for demographics, clinical history, hospital presentation and treatment variables. Median follow-up was 538 days.

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Urban versus Rural Differences in Key Quality Indicators of Acute Myocardial Infarction Care in Alberta, Canada

P. Diane Galbraith, L. Marie Hawkins, William A Ghali, Carol Connolly, Merrill L Knudson, Univ of Calgary, Calgary, Canada; for the APPROACH Investigators; Univ of Calgary, Univ of Alberta, Calgary / Edmonton, Canada

Background: One-year mortality rates after acute myocardial infarction (AMI) show considerable regional variation in Canada. This variability is due to age and other population differences; however, variables in compliance with treatment guidelines and access to diagnostic catheterization (Cath) facilities may also contribute. Objectives: Our goal was to examine the key indicators and compliance with established guidelines in rural and urban centres as a critical first step to improving AMI patient care. Methods: Between May 2004 and Dec 2005 all AMI admissions for AMI in one rural city (population 110,000) and one urban city (population 1,000,000) in Alberta, were prospectively monitored and tracked for medication use, referral to diagnostic Cath, revascularization (Revasc) procedures and readmission (readm). This surveillance was part of Alberta Provincial Project for Outcomes Assessment in Coronary Heart Disease (APPROACH), a population-based outcome initiative. Results: This presents early results of this regional AMI outcome analysis with particular regard to use of predicted effective medical therapies and access to Cath and Revasc procedures. Rural patients were older, more female and had a higher prevalence of diabetes and peripheral vascular disease than the urban cohort. Conclusions: A comprehensive regional model for AMI treatment and outcome is under development in Alberta. The current study confirms that important differences exist in medication use and in access to diagnostic and revascularization resources that may explain part of the reported mortality differences.

<table>
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<th>Urban (n=2142)</th>
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<th>Benchmarks</th>
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<td>Beta-blockers (%)</td>
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<td>ACE Inhibitors (%)</td>
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<td>Statins (%)</td>
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<td>76.3</td>
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<td>Length of Stay (days)</td>
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<td>7day Cath Rates (%)</td>
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<td>Mean time to Cath (SD)</td>
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<td>7day Revasc rates (%)</td>
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<td>30 Day Readm rates (%)</td>
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</table>

WITHDRAWN

C-Reactive Protein Gender Differences in Prediabetes and Diabetes

Paul Kolm, Christiana Care Health System, Newark, DE; Lawrence S Phillips, David C Ziemer, Mary K Rhee, Emory Univ, Atlanta, GA; Viola Vaccarino, Emory Univ, Atlanta, GA; William S Weintraub; Christiana Care Health System, Newark, DE

Background: Patients with diabetes and prediabetes, impaired glucose tolerance (IGT) and/or impaired fasting glucose (IFG), are at increased risk for cardiovascular disease (CVD). Increased levels of c-reactive protein (CRP) have been shown to be associated with higher risk for CVD, and have been shown to be higher in women than men. We assessed gender differences in CRP of diabetes, IFG and IGT subjects in comparison with normal glucose tolerant (NGT) subjects. Methods: From January, 2005 to January 2007, 999 volunteer subjects were screened for prediabetes by glucose tolerance tests. IGT and IFG were found in 207 (21%) and 110 (11%) subjects respectively. Results: Of the 999 subjects, 79 (8%) were identified as IGT alone; 166 (17%) as IFG alone; 82 (8%) were older, more female and had a higher prevalence of diabetes and peripheral vascular disease than the urban cohort. Conclusions: Women with diabetes are at disproportionately increased risk for CVD compared to men with diabetes. The disproportionate increase in CRP in women with diabetes and prediabetes compared to men suggests a role for inflammation in mediating the increased in CVD risk in these women compared to men.

C-Reactive Protein Gender Differences in Prediabetes and Diabetes

<table>
<thead>
<tr>
<th>NGT</th>
<th>IGT alone</th>
<th>IFG alone</th>
<th>Diabetes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>3.49 (100%)</td>
<td>5.32 (102%)</td>
<td>4.72 (35%)</td>
</tr>
<tr>
<td>Male</td>
<td>1.84 (100%)</td>
<td>2.37 (129%)</td>
<td>2.50 (35%)</td>
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</tbody>
</table>

Heterogeneity of Resource Utilization in Hospitalized Patients With Heart Failure

Jason Swindle, Mark A Schnitzli, Thomas E Burroughs, Paul J H Hauptman; Saint Louis Univ, St Louis, MO

Background: Hospitalizations for acutely decompensated heart failure (HF) account for a significant proportion of overall HF costs. Prior studies have documented heterogeneity within the hospitalized cohort (disease etiology, severity, adverse event risk); however, scant data exist on resource utilization. We examined hospital level data to evaluate the cost distribution according to medical therapy and length of stay (LOS). Methods: We used a PREMIER Perspective Comparative Database sample which provided nationally representative, patient level data for HF (primary ICD-9, DRG 127) admits to acute care hospitals (2004–2005, N=378). We examined total and daily hospital costs of therapy (i硝拓, dopamine, dobutamine), vasodilator [nitroglycerin, nitropresside, nesiritide], multiple vasoactive agents, diuretics alone, or no intravenous therapy (HF). T-tests and chi-square analyses were used to test for significance. Results: Cohort consisted of 239,303 patients (mean age 72.7y, 54% female, 61% white); prevalent comorbidities included hypertension (61%) and diabetes (44%). Inotropic therapy was accompanied by increased cost and LOS as compared to vasodilator therapy (Table). Inotropic patients were less likely to be initiated on the first day of hospitalization (41% vs 74%, p<.001). 51% of patients had total costs exceeding 2004 Medicare DRG rate; 17% exceeded double the rate. The latter, compared to the rest of the population, had greater LOS (11.6d vs 3.9d, p<.001), higher in-hospital death (7.9% vs 2.9%, p<.001), and greater use of vasoactive therapy (43% vs 19%, p<.001). Removal of vasoactive therapy costs had a minimal effect on average total cost. Conclusions: Heterogeneity exists in costs and process hospitalizations; a sizable proportion of patients have costs that exceed the HF DRG. Further study is required to examine the major contributors to these costs and evaluate ways to minimize the financial impact of HF hospitalizations.

Influence of Patient Casemix on Hospital Process Performance Rankings

Amrita M Karve, Rajendra H Mehta, Liang Li, Duke Clinical Resch Institute, Durham, NC; Gregory Foranow, UCLA, Los Angeles, CA; John S Rumford, Denver Med VA Cntr, Denver, CO; Eric D Peterson, Adrian F Hernandez; Duke Clinical Resch Institute, Durham, NC

Background: Hospitals are increasing benchmarked relative to peers based on evidence based care processes. While comparison of hospital outcomes typically account for differences patient casemix, process comparisons have not. We evaluated the impact of patient case-mix on hospital process performance ranking, as well as, potential eligibility for financial reward under pay for performance (P4P) programs. Methods: We analyzed 114,155 patients with acute MI treated at 325 hospitals participating in the AHA WITG program between Jan 2000 and April 2006. Hospital composite process performance was based on aggregate use among eligible patients of 8 CMS (Centers for Medicare and Medicaid Services) core measures. Hospitals were then ranked by composite performance first based on observed and then after adjusting for 16 baseline patient demographic clinical and socioeconomic factors; and clustering of patients within sites using a mixed random effect logistic regression model. Using composite scores, hospitals were also divided into top 20%, middle 60%, and bottom 20% performers to reflect P4P reward categories. Results: Top 20% hospitals tended to treat younger patients and fewer minority patients (p<.0001 for each). Relative to unadjusted hospital composite process performance, rankings, performance ranks were changed after adjustment for patient case-mix; mean change (22 ranks; median 15 ranks, range 0 to 147, IQR, 5 to 32). While in general there was a good degree of agreement between P4P financial groupings based on observed versus adjusted composite scores (weighted kappa 0.76), up to 15% of institutions changed their P4P financial status group after adjustment. Conclusions: Patient demographic, clinical and socioeconomic factors affect the likelihood of conformity with certain care processes and these factors vary by hospitals. Adjustment of process performance measures for patient case-mix had a modest influence on the hospital rankings and eligibility for financial reward under P4P.

Influence of Patient Casemix on Hospital Process Performance Rankings

<table>
<thead>
<tr>
<th>Initiated Therapy</th>
<th>Total (mean)</th>
<th>Total Cost</th>
<th>Vasos Cost Removed</th>
<th>In Hosp Death</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dobutamine</td>
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Health Care Utilities: Improving With Catheter Ablation for AF More Than With Drug Therapy: Analysis From a Randomized Trial

Matthew R Reynolds, Beth Israel Deaconess Med Cntr, Boston, MA; Bruno Cauchemez, Hosp St Louis, Paris, France; Laurent Macq, Montreal Heart Insitute, Montreal, Canada; Emile G Daoud, Ohio State Univ Med Cntr, Columbus, OH; Pierre Jais; Hospital Haut Leveque, Paris, France

Background: Radiofrequency catheter ablation (RFA) has been shown to improve symptoms and quality of life more than antiarrhythmic drugs (AADs) for patients with atrial fibrillation (AF).
Utility weights needed to calculate quality-adjusted life-expectancy for such patients are not currently available. **Methods.** A recently completed trial randomized 112 patients with paroxysmal AF to RFA or AADs. Quality of life measures included the 36-item Short-Form questionnaire (SF-36), which was administered at baseline and 3, 6, and 12 months following randomization. Using SF-36 responses, we derived utility scores using a published regression approach. ANCOVA models adjusting for baseline values were used to compare utility scores at each follow-up time point between groups based on intention to treat. Secondary comparisons were made between RFA patients and AAD patients who did and did not crossover to ablation. **Results.** Of 59 patients randomized to AADs, 37 (63%) crossed over to ablation during follow-up. Baseline utility scores were not significantly different between groups (0.72 vs. 0.71, \( p = 0.22 \)). By intention to treat, utility scores were significantly higher for RFA patients, at 3 and 12 months, but not at 6 months, after adjustment for baseline scores (Figure). Using a last-carried forward assumption for AAD subjects who crossed over, utility scores were significantly higher for RFA patients at all follow-up time points. **Conclusions.** Over 12 months follow-up, utility scores for PAF patients treated with RFA were 0.04 - 0.09 higher than for patients treated with AADs. These data may be helpful for evaluating the potential cost-effectiveness of RFA for AF.

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**Withdawned**

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**Is the Late Life Function and Disability Instrument an Effective Outcome Measure in Patients With Cardiovascular Disease?**

Tanya L Kinney LaPier, Kimberly K Cleary, Michele Watt; Eastern Washington Univ, Spokane, WA

Many self-report tools that measure function and disability are not sensitive to small changes or have a ceiling effect in populations with diverse activity competencies, like patients with cardiovascular disease (CVD). To address this measurement limitation, the Late Life Function and Disability Instrument (LLFDI) was developed and tested in community-dwelling older adults. The purpose of this study was to examine the concurrent validity and utility of the LLFDI in patients with CVD. The Functional Component of the LLFDI has 32 items that rate task difficulty and the Disability Component of the LLFDI has 16 items that rate task difficulty and frequency on a 5-point ordinal scale. Subjects (n=32) were patients over 60 years old with CVD participating in a cardiac rehabilitation program. Study participants completed the following outcome measures: LLFDI, Physical Activity Scale for the Elderly, Physical Function Subscale of the RAND 36-item Health Survey, London Handicap Scale, 6 Minute Walk Test, Timed-Up-and-Go, Walking Speed, and Timed Sit-to-Stand Test. We used descriptive statistics and correlations to analyze the data (\( P < 0.05 \)). All LLFDI components were significantly correlated (\( r = 0.36 \) - 0.83) with the Physical Activity Scale for the Elderly, Physical Function Subscale of the RAND 36-item Health Survey, and London Handicap Scale. The Function Component of the LLFDI was significantly correlated with 6 Minute Walk Test (\( r = 0.62 \), Timed-Up-and-Go (\( r = 0.59 \), Walking Speed (\( r = 0.56 \)), and Timed Sit-to-Stand Test scores (\( r = 0.56 \)). The LLFDI did not demonstrate a floor effect and only the Disability Components difficulty scale of the LLFDI had a ceiling effect in 10% of study participants. The results of this study show that scores on the Function Component of the LLFDI have a moderate to strong relationship with self-report and performance-based outcome measures in patients with CVD. Also, scores on the Disability Component of the LLFDI have a moderate relationship with self-report outcome measures but little relationship with performance-based outcome measures. Study results suggest the LLFDI has acceptable validity with minimal floor/ceiling effects in patients with CVD and therefore would be a useful functional outcome measure.

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**Trends in Antiplatelet Therapy Use Following Discharge Among Acute Myocardial Infarction Patients With In-Hospital Bleeding**

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**Background:** In-hospital bleeding or transfusion use is associated with worse long-term outcomes among AMI patients (pts). The mechanism for this association is unclear; one potential explanation is that antiplatelet therapies are withheld beyond resolution of the bleeding event. **Methods:** We examined medication use at discharge, 1, 6, and 12 months post-AMI among 2498 pts enrolled in the PREMIER registry. Logistic regression was used to determine the association between bleeding or transfusion use during index AMI hospitalization and post-discharge medication use. **Results:** The 451 pts (18.1%) with bleeding during their AMI hospitalization were older and more likely to have hypertension, diabetes, renal insufficiency or prior heart failure. There were no differences in coronary angiography and revascularization during index hospitalization. In multivariable analysis, pts with in-hospital bleeding were less likely to be treated with aspirin or thienopyridines while beta-blocker use was not significantly different (Figure). This difference in antiplatelet therapy use persisted out to 6 months. **Conclusions:** Patients who bleed during their index AMI hospitalization represent a higher-risk population that is less likely to be treated with antiplatelet therapies well after discharge. Whether persistence of less treatment with antiplatelet agents after MI contributes to their higher long-term mortality needs further evaluation. After acute bleeding concerns have resolved, physicians need to continually assess the possibility of safely re-initiating these effective anti-ischemic therapies. **Figure. Medication Use Over Time in Bleeding vs. Non-bleeding Patients†**

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**2007 Outcomes Abstracts**

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WITHDRAWN
Understanding Practice Patterns and Low-Density Lipoprotein Cholesterol (LDL-C) Goal Attainment Implications of Switching Patients From Simvastatin in a Health Plan Setting

Carolyn Harley, Si Innocue, Eden Prairie, MN; Sanjay K Gandhi, Nze Anoko, Michael F Bullano, Atasha Zzemica, Wilmington, DE; James McKinney, National Clinical Risk, Richmond, VA

Objective: To understand the practice patterns and National Cholesterol Education Panel (NCEP) Adult Treatment Panel (ATP) III low-density lipoprotein cholesterol (LDL-C) goal attainment rates after switching patients from Simvastatin to other statins. Methods: This retrospective study linked claims and laboratory data from a national health plan. Patients on simvastatin (SMV) were included if they were switched to another statin or a fixed dose combination of simvastatin and ezetimibe (SMV/EZE) during the July 1, 2005 and June 30, 2006 period. The NCEP ATP III risk status of patients at switch was assessed based on medical, pharmacy claims and laboratory values in the 12-month pre-switch period. Lipid data (available on a patient subset) was used to estimate patients’ goal attainment status at and after switch. Results: Of 134,168 patients on SMV, 11,929 (9%) switched. The mean age of switching patients was 65±9 years (88% men, 7% MI, 5% PCI, 80% at risk, and 20% high risk). The mean time to switch from among new starters of SMV was 3.37 days. There were 11,929, 40% of switches occurred at 5, 10, and 20 mg (lower) doses of SMV. Most patients switched from SMV (11,929) to SMV/EZE (60.5%) followed by ATV (17.3%), RSV (10.4%). In patients in the 40–74 year age range, the median LDL-C goal attainment rates after switching patients from Simvastatin to other statins was 54 years (SD 8.7), 61% were male, 50% were high risk and 20% were moderate risk. Patients were not at goal at switch (6,604), 73.3% attained LDL-C goal after switch. The mean LDL-C reduction needed to attain LDL-C goal at switch (6,604) was 18.1%. Conclusions: There is an opportunity to further increase LDL-C goal attainment rates among patients switched from SMV. Clinical prescription benefit design and economic implications of the finding that a majority of patients could be most marked. The purpose of this study was to examine gender differences in the receipt of appropriate prophylaxis in patients with acute myocardial infarction (MI), unstable angina, and suspected MI. Introduction: Venous thromboembolism (VTE) is a common post-surgical complication that in many cases is preventable. VTE prophylaxis is now the object of national attention as the CMS and JCAHO introduce SCP VTE quality measures. This study assesses thromboprophylaxis rates for hospitalized surgical patients in the United States. Methods: The Perspective database was used to assess VTE prophylaxis rates in surgery patients. Patients age 40 or older, with a minimum length of stay of six days, and no contraindications for anti-coagulation were included in the study. Appropriate thromboprophylaxis was determined by comparing the daily use of anti-coagulants, compression devices, dosage, and prophylaxis duration with ACCP recommend-ations. Results: 85,970 discharges between January 2002 and 2005 were included in our study. VTE prophylaxis varied significantly across surgical groups (S:512 of 1,008) for hip arthroplasty, 54% (204 of 375) for hip arthroplasty revisions, 65% (25 of 40) for hip fracture surgery, 85% (2,333 of 2,742) for knee arthroplasty, and 75% (282 of 376) for knee arthroplasty revisions. Also, 31% (22,789 of 73,021) of general surgery, 26% (883 of 3,420) of urologic, 24% (193 of 809) of gynecologic, and 2% (12 of 527) of neurosurgery discharge records recommended thromboprophylaxis. 47% (27,567 of 59,676) of patients received the recommended anti-coagulation, but only 32% (27,768 of 85,970) received the recommended thromboprophylaxis. 27% (23,163 of 85,970) received no prophylaxis, 27% (23,070 of 85,970) received only mechanical prophylaxis, 5% (4,060 of 85,970) did not receive prophylaxis for the recommended duration, and 9% (7,697 of 85,970) did not receive a sufficient dosage. Discussion and Conclusion: There is a significant gap in adherence with ACCP guidelines in surgical patients. Two out of three discharges did not receive the recommended therapy although rates for orthopedic surgery were higher than other surgical specialties. With the implementation of the SCP VTE-1 and VTE-2 quality measures by the CMS and JCAHO beginning in 2007, more effort is required to increase awareness of ACCP recommendations for thromboprophylaxis.
hospitalization for AMI. Methods: Using national data on fee-for-service Medicare patients from the Cooperative Cardiovascular Project (CCP) in 1994–95, the National Heart Care (NHC) in 1998–99 and the National Heart Care Remeasurement project in 2000–01, we studied patients discharged after AMI, categorized by gender for 5 current Medicare PMs for drug therapy; treatment with aspirin and beta-blocker within 24 hours of admission, prescription of aspirin and beta-blocker at discharge, and prescription of ACE-I for patients with LJDG at discharge. Exclusion criteria for each treatment, as well as demographic and clinical covariates, were obtained from medical chart review. Mortality was determined from the Medicare enrollment database and adjusted for the common confounders using multivariable logistic regression models. Finding: The percentage of patients who were not prescribed any medications at discharge among the 5 PMs increased from 19.5% in 1994–5, to 24.6% in 1998–9, to 26.3% in 2000–1. Rates of nearly all measured commodities, including PM contraindications, were higher among non-candidates both over time and when compared with candidates for at least 1 PM. (Table) Non-candidates had higher than currently appreciated. Diverse physical symptoms may be associated with poor heart failure-related quality of life, and depression may be related to increased physical symptoms. Treatment of depression and diverse physical symptoms in heart failure patients might significantly improve quality of life.

Impact of Gender on Quality of Life After Heart Valve Surgery
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Background: Despite reported disparities in mortality and morbidity between men and women after heart valve surgery, the impact of gender on health-related quality of life (QOL) has received little study and has not been evaluated using disease-specific measures in this population. As part of a prospective pilot study, we administered the Minnesota Living with Heart Failure Questionnaire (MLHQF) to 48 patients (27 men and 21 women, age 66±16 years at operation, 63% with preop symptomatic HF) who underwent aortic and/or mitral valve surgery coronary bypass grafting. Paired t-tests were used to compare men and women over time on MLHQF total, physical dimension (PD) and emotional dimension (ED) scores; analysis of covariance was used to adjust for baseline differences in age; Spearman rank order correlation was used to examine the association between QOL and preop HF and QOL with the magnitude of postop QOL benefit. Results (table): Conclusions: At this pilot study, differences in QOL were not shown to be related to gender improvement in men than later after valve surgery, suggesting a particular and previously unappreciated benefit for women. Magnitude of postop QOL benefit was greatest among those women with poorest QOL and HF symptoms before surgery. Health care providers should consider these factors when counseling patients about expected postoperative outcomes.

Factors Associated With Utilization of Drug-Eluting Stents for Patients With and Without Acute Myocardial Infarction: The Role of Insurance Status

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 demographics, hospital characteristics, diagnoses and procedures were obtained for these inpatient episodes of care. Additional hospital characteristics were obtained by linkage to American Hospital Association Annual Survey of Hospitals data. Patients were used in hierarchical logistic regression models 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 162,382 non-AMI PCI patients were identified of whom 79% and 88%, respectively received a DES. In adjusted analyses, having a commercially insured payer was significantly associated with DES use (commercial vs. Medicaid payer odds ratio (OR) for AMI patients: 1.34 [95% CI: 1.20, 1.49]; OR for non-AMI patients: 1.48 [95% CI: 1.34, 1.64]). Similarly, patients covered by a managed care payer were more likely to receive a DES than patients with Medicaid coverage (OR for AMI patients: 1.41 [95% CI: 1.25, 1.55]; OR for non-AMI patients: 1.45 [95% CI: 1.33, 1.58]). Additionally, being younger, female, white, and of lower estimated clinical severity was associated with an increased likelihood of receiving a DES (female vs. males for OR for AMI patients: 1.26 [95% CI: 1.20, 1.31]; white vs. black for OR for AMI patients: 1.15 [95% CI: 1.06, 1.24]). Conclusions: 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
Young Women Undergoing Elective PCI Procedures Have Higher Complication Rates Than Similarly Aged Men: Results From the ACC-NCDR Registry

Judith H Lichtman, Yongfei Wang, Jethro P Curtis, Emy Watanabe, Nonnina B Allen, Yale Sch Of Medicine, New Haven, CT; Leslee J Shaw, Emory Univ Sch of Medicine, Atlanta, GA; John S Rumsfeld, Denver VA Med Cntr, Denver, CO; Harlan M Krumholz; Yale Sch Of Medicine, New Haven, CT

Background: Complication rates following cardiovascular procedures have generally been reported to be higher for women, but relatively little is known about complication rates for young women undergoing elective PCI procedures. Methods: We examined complication rates by gender and age (<35, 35–55, >55) among patients undergoing elective PCI in 2005 using the ACC-NCDR Registry. In-hospital complications were categorized as general complications (periprocedural MI, cardiogenic shock, stroke, tamponade, contrast reaction, renal failure (RF), emergency PCI) and vascular/bleeding complications (percutaneous entry site, retroperitoneal, gastrointestinal, genital-urinary, GU), other/unknown, access site occlusion, peripheral embolization, dissection, pseudoaneurysm, pseudoaneurysm treatment, AV fistulae). Risk adjusted models compared rates using young men as the referent group. Results: Among 9,857 patients (35.5% female; 85.2% white; 52.3% <55 yrs), women present with more comorbid conditions (CHF, HTN, DM, RF, CVA; p=0.001 for each comparison) and have higher overall rates of complications than men (10.7%, 6.1%; p=0.001), regardless of age (figure; p=0.001). Younger women have higher rates for 14 of 19 complications, and a risk adjusted rate double that of similarly aged men (OR 2.0, 95% CI 1.5–2.7). Overall, risk adjusted rate differences are highest for older women (OR 3.3, 95% CI 2.4–4.5), followed by older men (OR 2.3, 95% CI 1.7–3.1; age-sex NS). Conclusions: Complications rates following elective PCI are high for young women as well as older women. Future research should examine how these higher rates may contribute to the excess mortality for younger women with MI.
129 Factors That Influence Participation in Exercise and Feelings About Health and Quality of Life in Patients Following Coronary Artery Bypass Surgery
Tanya L. Kinney LaFier, Kristen M White, Kimberly K Cleary; Eastern Washington Univ, Spokane, WA

Adoption of exercise as a lifestyle behavior is important for secondary disease prevention in patients following coronary artery bypass (CAB) surgery. The purpose of this qualitative study was to explore factors that influence participation in cardiac rehabilitation (CR), feelings about exercise, health and quality of life, and perceived activity limitations in patients following CAB surgery. Twenty-eight people were purposively recruited to participate following surgery and prior to hospital discharge. Data collection took place by phone interview 3 months (±1 year) after surgery. Participants were asked a series of open-ended questions related to their participation in CR, feelings about exercise, health and quality of life, and perceived activity limitations. Responses were audio recorded, transcribed, and analyzed. Data were coded by identifying significant statements, grouping them into meaningful units, and generating thick, rich descriptions of participants’ perceptions. Six themes emerged from the participation in CR data: order under influence, patient choice, accountability, accessibility, improved health and protection/security. The data on factors that helped people to exercise produced eight themes: to improve health, feel better, enjoy being active, self-motivation, companionship, get outside/setting, habit, and get back to previous activities. Factors that prevented respondents from exercising produced seven themes: fear of pain, time, pain, weather, and nothing specific. Four themes emerged from the feelings about health and quality of life data: improved health, no change, unaware of problem, and need to get strength back. Perceived activity limitations data revealed four themes: no limits, limited by co-morbidities, caution/limited by fear, and limited by medical orders. Adherence to exercise is an important clinical issue, especially for patients with heart disease, and the factors influencing it are poorly understood. Findings from this study will give health care providers insight on patients’ perceptions of factors that influence exercise adherence, feelings about health and quality of life, and perceived activity limitations 3 months after CAB surgery.

130 Cost-Effectiveness of Sirolimus-Eluting Stents vs. Vascular Brachytherapy for In-Stent Restenosis: Results From the SISR Trial
Matthew R Reynolds, Beth Israel Deaconess Med Ctr, Boston, MA; Joshua Walczak, Ronna Berezin, Harvard Clinical Rech Institute, Boston, MA; DUane S Pinto, Beth Israel Deaconess Med Ctr, Boston, MA; David R Holmes, Jr., Mayo Clinic, Rochester, MN; David J Cohen, Mid America Heart Institute, Kansas City, MO

Background: Sirolimus eluting stents (SES) were recently shown to be superior to vascular brachytherapy (Brachy) in reducing in-stent restenosis. The cost-effectiveness of SES compared to Brachy has not been determined. Methods: We compared the cost of a health economic study involving all patients randomized to SES (n = 259) or brachytherapy (n = 125) in the SISR trial. Procedural, hospital, and outpatient costs, as well as physician fees, were estimated through 12 months based on measured resource utilization and itemized hospital bills. Cost-effectiveness was assessed in terms of cost per repeat revascularization avoided, cost per major adverse cardiac event avoided (MACE), and cost per event-free patient. Results: Among initial device costs were ~$1200/patient higher with SES, this was offset by higher physician fees associated with brachytherapy, such that initial hospitalization costs were similar between groups (Table). Because SES significantly reduced repeat revascularization procedures and MACE compared with brachytherapy, cumulative 12-month costs were significantly lower in the SES group ($16,482 vs $19,435, p = 0.02). SES was thus both more effective and less expensive than brachytherapy, as confirmed in ~98% of bootstrap replications for each of the cost-effectiveness outcomes. Conclusions: Compared with brachytherapy, SES is an economically dominant strategy for the treatment of in-stent restenosis.

132 Factors Associated With Mortality Among Patients With Congestive Heart Failure
Murtuza F Bharmal, Andrew Linnstaedt, Quintiles, Falls Church, VA; Teresa Zyczynski, GE Healthcare, Princeton, NJ; Eric Gemmen; Quintiles, Falls Church, VA

Objective: To examine mortality rate and factors associated with mortality among Medicare patients following discharge from an initial hospital admission for congestive heart failure (CHF). Methods: Analyses were conducted on a national 5% sample of Medicare claims from January 1, 2004 to December 31, 2006. A cohort of patients with an initial hospitalization with a primary diagnosis of CHF was identified and followed for a period of one year. Mortality rates were calculated for 30-day, 60-day, 90-day, 180-day and 365-day periods following their initial CHF admission. Healthcare use and patient comorbidity were also estimated using data for the one-year period prior to the initial CHF admission. Factors associated with one-year mortality were assessed using a multivariate logistic regression model. The regression model included variables for patient characteristics, Charlson comorbidity index score, compliance with routine care and healthcare resource use in the 12-month period prior to the initial CHF admission. Results: A cohort of 34,540 elderly patients with an initial hospital admission for CHF in 2004 were identified. A majority, 29,643 (86%) of the CHF patients were white, one-half of the individuals were 80 years or older (17,299) and approximately 58% or 20,091 were female. Mortality rates at 30-day, 60-day, 90-day, 180-day and 365-day were 8.5% (2,938), 12.8% (4,410), 16.1% (5,526), 22.9% (7,894), and 31.4% (10,845), respectively. The trend in mortality rate was similar to hospital readmission rates over time. The likelihood of mortality within a year was negatively associated with African-American compared to whites (Odds ratio (OR) = 0.70), physician office visit within 30 days of CHF admission (OR = 0.35) and positively associated with male (OR = 1.38), hospital admissions in the 12-month period prior to the initial CHF admission (OR = 1.06) and patient comorbidity (OR = 1.11) (all p-values < 0.05). Conclusions: A large proportion of Medicare beneficiaries die within one year of their initial CHF hospital admission. Determining the patient health status over time and targeting interventions among patients especially those at a higher risk of mortality carries potential to improve patient outcomes among CHF patients.

133 Thrombolysis Screening Failures: A Detailed Analysis of Reasons for Non-Treatment and Opportunities for Improvement
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In a large suburban hospital for the first eleven months of 2006, there were 1162 patients with stroke or TIA. 336 were excluded for thrombolysis by virtue of hemorrhage, 313 had TIA. The Stroke Improvement Project (SIP) found 67% of the 483 patients treated with thrombolysis by the ST, nearly all had stroke diagnosed after admission, were directly admitted circumventing the ST, suffered a stroke post-operatively or associated with a critical illness and the ST was therefore not called. Among those seen by ST, 151 were excluded because of stroke onset – > 8 hours. Of the remaining 175, 58 were excluded because of low NIHSS, 22 with abnormal CT and 78 with rapid improvement. 18 patients, or 3.7% of all patients with discharge diagnosis of stroke were treated. This is 100% of those evaluated by ST and not otherwise excluded. Discounting those not seen by ST – the percent treated is 5.5%. Some suggest patients with improved symptoms with low NIHSS scores are being missed by the ST, they (reportedly) have a poor outcome they should be more aggressively treated. Judging by discharge disposition, our patients did well: 63 were discharged home, 8 to SNF and 6 to Rehab. 61 were able to ambulate independently, 14 with assist of another person and 3 were unable to ambulate. The effect of offering thrombolysis to these patients is speculative, but merits consideration and prospective evaluation. Efforts under way are to ensure that all stroke

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patients are evaluated by ST, especially those whose strokes occur or are diagnosed after admission.

**Outpatient Diagnosis of Venous Thrombophlebitis Tripples: Results From a National Survey**

Sameer A Gafoor, Sahand Rahnama-Moghadam, Gilbert R Upchurch, Peter K Henke, Thomas W Wakefield, James B Froehlich; Univ of Michigan Hosp, Ann Arbor, MI

**Background:** Thrombophlebitis (superficial venous thrombosis) is a common clinical problem. Little is known about the care of these patients in the ambulatory setting or the providers who render that care. **Methods:** The National Ambulatory Medical Care Survey (NAMCS) is a nationwide outpatient office visit registry that is weighted to permit national estimates. We reviewed demographic and care data for all patients seen with diagnosis of thrombophlebitis between the years 1995 and 2003. **Results:** Thrombophlebitis reporting more than tripled between 1995 and 2003 (489,202 to 1,581,752, p < 0.005), averaging 1,086,697 office visits per year. The majority were female (60.0%) and white (87.7%). Their mean age was 61.9 years and 47% had their care paid for by Medicare or Medicaid. Family practitioners and general internists saw the majority of these patients (60.5%), followed by orthopedic surgeons (13.2%). Sixteen percent were referrals. **Conclusion:** The reporting of thrombophlebitis in the outpatient setting is increasing. Much of the care of these patients comes from primary care providers. This may represent a significant shift from inpatient to outpatient diagnosis of venous thrombophlebitis rather than an increase in disease prevalence.

**Lipid Control in Two Different Cardiology Clinics Managed by the Same Cardiologist**

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**Background:** The availability of a recent lipid profile during a patient’s clinic visit can enhance decision-making regarding starting, or proper dosing, of lipid therapy, and aid in achieving treatment goals. **Methods:** Clinic notes from a single cardiologist who concurrently provides a University-based clinic with a broad referral base and a Veterans Administration (VA) community-based outpatient clinic were retrospectively reviewed and compared for availability of lipid profiles and level of lipid control in patients with documented coronary disease. **Results:** There were 93 patients (31%) with documented CAD in the University clinic compared to 77 patients (57%) in the VA clinic. Only 61% (57/93) of the University patients with CAD had documented lipid profiles during their visits compared to 99% (76/77) of the VA patients. The average LDL for the University patients was 111 +/- 32 mg/dl compared with 93 +/- 35 mg/dl for the VA patients (P = 0.004); with only 39% (22/57) of the University patients reaching goal of <100 mg/dl, compared with 66% (51/77) of the VA patients. There were no significant differences in the blood pressures which were consistently documented every visit in both clinics. **Conclusion:** Better lipid control is seen in the VA-based clinic. This may partially be due to availability of the results through a unified computer system, allowing decision-making regarding therapeutic options and dietary counseling during the visit. This is not the case in other settings where laboratory reports performed by a primary care provider may not be readily accessible. Other factors, including compliance with laboratory appointments and enhanced access to medications may play a role.

**Race, Gender, and Outcomes of Congestive Heart Failure in Adults ≥65 yrs of Age: The Cardiovascular Health Study**

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**Introduction:** Among patients with congestive heart failure (CHF), mortality is lower in women vs. men and whites vs. African-Americans (AA). We examined whether the survival advantage in women compared with men is present in both whites as well as AAs, using an inception cohort of adults ≥65 yrs who developed new-onset CHF after enrollment in the Cardiovascular Health Study (CHS), a prospective, population-based study of cardiovascular disease. **Methods:** Of the 5,688 CHS participants, 1,262 (541 white women; 105 AA women; 552 white men and 64 AA men) developed new CHF and were included in analyses. Outcome measures were 1) all-cause mortality; and 2) cardiovascular (CV) mortality. We categorized participants into four groups based on race and sex and used Cox proportional hazard regression models to examine whether total and CV mortality differed in the four groups after adjusting for sociodemographic factors and comorbidities. **Results:** Compared with other sex-race groups, AA women and white men had higher comorbidities yet receipt of CV treatments (aspirin, angiotensin converting enzyme inhibitors, beta-blockers, calcium channel blockers and lipid lowering agents) between the groups was similar. During a median follow-up time of 2.4 yrs 823 participants died, of which 456 were CV deaths. After adjusting for covariates, white women had a 22% lower risk of total mortality and 34% lower risk of CV mortality compared with white men (Table). There was no significant difference for either endpoint comparing AA women or AA men with white men. **Conclusion:** Of the 4 sex-race groups, white men with CHF had significantly better survival. This survival was not shared by AA women. Understanding the reasons for these mortality differences should provide insight into strategies for improving the prognosis of CHF among all sociodemographic groups.

**The Importance of Therapy Intensification and Medication Non-Adherence for Blood Pressure Control in Patients With Coronary Artery Disease**

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**Background:** Despite the importance of blood pressure (BP) control in secondary prevention, a significant proportion of patients with coronary artery disease (CAD) have uncontrolled BP. **Methods:** This was a retrospective cohort study of 10,447 patients with CAD. Medication adherence was calculated as proportion of days covered (PDC) for filled prescriptions of anti-hypertensive medications. Therapy intensification included dosage increase or an increase in number of antihypertensive medications. The primary outcome was uncontrolled systolic BP (SBP) over time, using a latent class model which incorporated longitudinal SBP data and assigned patients into SBP trajectory groups. **Results:** Three SBP trajectory groups were identified: 1) patients with controlled SBP over time (n = 9114, 87.2%); 2) patients with high SBP which became controlled (n = 779, 7.5%); and 3) patients with BP which remained high over time (n = 554, 5.3%) (Figure). In multivariable analyses, therapy intensification (HR (95%CI) 0.65, 1.29) and medication non-adherence (PDC <0.80) (HR 1.17, 1.49) were both significantly associated with having uncontrolled SBP compared with patients with high SBP which became controlled over time. **Conclusion:** The results of this study suggest that medication non-adherence can help explain why BP levels remained elevated despite intensification of medications. Successful BP control is seen with intensification and adherence, suggesting that therapy intensification must be coupled with interventions to enhance medication adherence. Future interventions to improve BP control among CAD patients should incorporate both of these components.

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**Table: Association of Sex and Race With Time to Death and Cardiovascular Death**

<table>
<thead>
<tr>
<th>Sex</th>
<th>Age Adjusted Hazard Ratio (95% CI)</th>
<th>5-Year Rate</th>
<th>10-Year Rate</th>
</tr>
</thead>
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<td>White women</td>
<td></td>
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<td>White men</td>
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<td></td>
</tr>
<tr>
<td>AA men</td>
<td></td>
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</tr>
</tbody>
</table>

**Note:** For sociodemographic factors and comorbidities.
Enhanced External Counterpulsation Improves One-Year Mortality in Angina Patients With Heart Failure

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Background: Enhanced external counterpulsation (EECP) improves symptoms in refractory angina patients with heart failure (HF), but its effect on mortality is unknown. **Methods:** Data from 1,333 angina pts with HF enrolled in the International EECP Registry were analyzed by course completion (≥30 hrs of EECP) to evaluate outcomes and 1 yr mortality. Multivariable analysis of pts alive at 60 days after starting EECP was used to determine independent predictors of 1 yr mortality. Results: Of the 1,333 pts, 1,075 had ≥30 hrs of EECP (C; 36.1 hrs mean), 259 had <30 hrs (G; 7.3 hrs mean). C pts were younger (55.6 yrs vs. 66 yrs for C, p<0.05), and more likely to be male (73.1% vs. 63.2%, p<0.01). Medical history and symptoms at baseline were similar for IC and C cohorts: HTN (80.1% vs 78.4%), dyslipidemia (83.9% vs 83.3%), DM (55.9% vs 52.1%), smoking (74.7% vs 72.3%), prior CABG/PCI (90.2% vs 90.0%), coronary artery disease (CAD) (98.8% vs 98.6%). Severe angina was present in most IC and C (95.7% vs 93.5%). During EECP more IC stopped for clinical events (15.9% vs 0.8%): deaths (4.7% vs 0.5%), AMI (3.2% vs 0.9%), MACE (9.3% vs 1.8%, p<0.001). Post EECP more IC had CCS IV/V angina (82% vs 22%) and fewer improved ≥1 CCS stage (61% vs 17%, p<0.001). At 30 hrs EECP (C; 36.1 hrs vs 27.5 hrs in IC), MACE (29.7% vs 19.2%) and pts in CCS III/IV (47.1% vs 25.8%) were significantly greater in the IC cohort (p<0.01). Significant predictors of mortality included: LVEF ≤35% (HR 1.78; CI 1.27–2.49), DM (HR 1.53; CI 1.11–2.13), Male gender (HR 1.50; CI 1.01–2.21), Age/10 yrs (HR 1.09; CI 1.02–1.16). **Conclusions:** Prognosis of EECP is poor in pts with HF. EECP patients have higher mortality rates than IC pts at 60 days. Independent predictors of 1 yr mortality: LVEF ≤35%, DM, Male gender, Age/10 yrs. Further research is needed for HF patients undergoing EECP to improve survival and reduce morbidity.

Frequency of Stress Testing Prior to Elective Percutaneous Coronary Interventions in a Medicare Population

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Background: Current guidelines for elective percutaneous coronary intervention (PCI) suggest that documenting ischemia with stress testing should be done to determine the need for PCI in patients with stable coronary artery disease. Our objective was to determine the frequency of stress testing prior to elective PCI in an aged, fee-for-service Medicare population. **Methods:** We examined data from the Medicare Provider Analysis, Physician/Supplier and Denominator Files for a random 20% sample of Medicare beneficiaries on all fee-for-service patients 65 years and older who had elective PCI in 2004. We then calculated the proportion of patients who underwent stress testing in the 90 days prior to an elective PCI, and examined rates of stress testing by hospital referral region, age, sex, and race. Results: In the 20% Medicare sample, we identified 22,750 patients who had elective PCI in 2004. Nationally, only 44.8% of patients underwent stress testing in the 90 days prior to PCI. Proportions varied widely among hospital referral regions with at least 25 elective PCIs ranged from 19% to 70.6% (interquartile range 39.3%, 50.9%). Rates of stress testing prior to PCI by age, sex, or race varied little - less than 5 percentage points - between groups. **Conclusions:** In the majority of Medicare patients with stable coronary artery disease, stress testing to document ischemia is not being done prior to elective PCI. As the 2005 American College of Cardiology/American Heart Association/Society for Cardiovascular Angiography and Interventions guidelines generally require documentation of ischemia prior to elective PCI, this finding suggests a lack of adherence to guidelines for PCI, meaning that interventions which are not useful or effective may be common in the Medicare population. The wide variation in geographic rates also indicates that factors other than professional guidelines are influencing treatment of stable coronary artery disease, suggesting a need for new mechanisms to encourage greater evidence- and guideline-based clinical decision making.

Long-Term Quality of Life Profile Analysis of Mitral Valve Repair and Replacement Patients

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Background: Health status associated with mitral valve (MV) repair versus replacement is not well established in a longitudinal setting. The purpose of this study was to compare health status profiles of mitral valve repair and replacement patients who had measurements prior to surgery and at 1 year following surgery, and a cohort of patients who had measurements from 4 to 16 years following surgery. **Methods:** Longitudinal quality of life data obtained from 136 MV surgery patients, 79 repair patients and 57 replacement patients prior to surgery (baseline) and 12 months following surgery. Retrospective data were obtained from a matched case control study using the Emory cardiovascular clinical database. SF36 measures were obtained for 200 patients, 119 repair and 81 replacement, with measurements obtained 4–16 years following surgery. To adjust for potential differences in cohorts, a repair vs. replacement propensity score was calculated for each patient based on patient demographics, clinical variables and follow-up year. Multivariate profile analysis was used to compare repair and replacement profiles for each of the 8 SF36 domains. **Results:** At baseline, but 1 year following surgery, MV repair patients had a significantly better profile than replacement patients (p<0.05). For the long term cohort, there was no significant repair vs replacement profile difference (p = 0.1538). **Conclusions:** MV repair patients indicated better health status at baseline and 1 year following surgery than replacement patients. Long-term, however, SF36 profiles of the two groups were more similar.

Are Evidence-Based Clinical Processes and Structures Associated With Lower Risk-Adjusted Mortality Rates and Increase Use of Acute Percutaneous Coronary Intervention Among Myocardial Infarction Patients in Community Hospitals?

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Objective: This study examines the relationship between 13 Evidence-Based Clinical Processes and Structures (EBPCS) recommended for treating STEMI patients and risk-adjusted in-hospital mortality and acute PCI rates in community hospitals. **Methods:** Data for this retrospective study are derived from HCA Heart Services Standards Database, a web-based survey of EBPCS each HCA hospital has implemented and HCA Casemix administrative database. The study population consists of 99 HCA hospitals with cath labs performing PCI that also treated at least 52 primary STEMI patients between 10/1/2005 and 9/30/2006. Each hospital’s risk-adjusted mortality rate was estimated from a logistic regression model controlling for 19 demographic and co-morbidities. Pearson’s product-moment correlation coefficients (PCC) were estimated to determine the association between the presence or absence of each EBPCS and a hospital’s risk-adjusted mortality rate or its acute PCI rate (PCI on date of admission) among STEMI patients. **Findings:** The average risk-adjusted in-hospital mortality rate among STEMI patients was 8.7% and on average 54% of the STEMI patients underwent an acute PCI. The estimated PCC was negatively associated with the hospital’s risk-adjusted mortality rate for all but one of the EBPCS, and was positively associated with STEMI patients undergoing an acute PCI for all the EBPCS. The results also indicated that the association between EBPCS and the hospital’s acute PCI rate was significant (p<0.05) for 10 of the 13 EBPCS activities, while the negative association between EBPCS and risk-adjusted mortality only reached this level of significance for four activities. The EBPCS shown to have the strongest correlations with a hospital’s acute PCI rate were: 24/7 on-call availability of interventional cardiologist (PCC = 0.31), rapid activation of all EDs (PCC = 0.29), 24/7 availability of PCI service (PCC = 0.27), and rapid access to Cardiac Biomarkers (PCC = 0.28). **Conclusion:** There is a strong positive association between implementation of EBPCS and a hospital’s acute PCI rate among STEMI patients, and a modest association between EBPCS and the hospital’s risk-adjusted mortality rate.

Effect of Pre-Existing Statin Use on In-Hospital Mortality and Functional Status at Discharge in Stroke Patients: A Propensity-Based Analysis

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Background and Purpose: Statins are known to reduce the risk of stroke in high-risk populations. However, there is also increasing evidence that patients who are on statins have better outcomes following an ischemic stroke (IS). Our objectives were to examine the effects of pre-existing statin use on stroke outcomes in hospitalized IS patients. Methods: A representative sample of 16 Michigan hospitals was obtained as part of a statewide acute stroke registry. At each hospital, all acute stroke admissions between May - November 2002 were prospectively identified. Information on past medical history (PMH), statin use at admission, and pre-stroke functional status were collected. Primary outcomes were in-hospital mortality and moderate-severe disability at discharge (modified Rankin scale [mRS] ≥4). Logistic regression analyses generated using GEE were used to quantify the effect of pre-existing statin use on mortality and functional status adjusting for potential confounding variables. Because of the anticipated differences in statin users and non-users we also used a propensity score-based method to balance the measured covariates. Results: In-hospital mortality rate was 5.4% (76/1391), and 39.0% (501/1284) of subjects had moderate-severe disability. About 22% of subjects were taking statins prior to admission. Statin use was highest in subjects 60–79 years old, and was more likely in subjects with a PMH of stroke, OHD, hypertension, or diabetes. IS patients on statins at admission were less likely to die in-hospital (adjusted odds ratio [aOR] = 0.32 [95% CI 0.16 - 0.63], and were less likely to have moderate-severe disability at discharge (aOR=0.72 [95% CI 0.51 - 1.00]), compared to IS patients not on statins. Propensity score-adjustment reduced the effect of statins on in-hospital mortality (aOR=0.63 [95% CI 0.31 - 1.27]), whereas it had no meaningful impact on the functional status analysis. **Conclusion:** Use of statins prior to an IS was associated with
improved outcomes at discharge. These effects remained despite adjustment for known confounding variables and the use of propensity score-adjustment. These findings lend further support for the use of statins in stroke prevention and treatment.

Usefulness of a System Management Telehealth Intervention on Recovery Outcomes of Elderly Coronary Artery Bypass Graft (CABG) Surgery Patients With High Coronary Artery Disease Burden

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Poor outcomes following CABG surgery are more prevalent among patients at higher risk based on preoperative health status. The purpose of this subanalysis study was to examine the impact of a symptom management telehealth intervention on psychosocial, physiological functioning and physical activity factors associated with increased morbidity and mortality following cardiac surgery. Subjects (N=46) in this sample subset, were those subjects with preexisting, high coronary artery disease (CAD) burden, who had been enrolled in a larger randomized clinical trial (RCT). The parent study tested the effect of a symptom management telehealth intervention, delivered over 6 weeks using the Health Buddy®, on recovery outcomes of elderly (>65 years old) CABG subjects in at 3 and 6 weeks, and 3 and 6 months after surgery. High CAD burden was determined as a score of <12/2/10/10 based on BP, body weight, serum cholesterol, tobacco use and was risk adjusted for diabetes. Using a ARNOVA, there was a significant [F(1, 18) = 5.97, p < 0.05] group effect for self efficacy. Subjects with high CAD burden (n=16) in the experimental group had higher perceived self-efficacy, or increased confidence, in their ability to manage their self-care pertaining to surgery recovery as compared to the control group (n=24) using the Bamason Efficacy Expectation Scale (BEES). There was a significant group effect [F(1, 26) = 4.17, p < 0.05] related to depression, measured by the Hospital Anxiety and Depression Scale (HADS); with less depression reported by the treatment group. Using one-way ANOVA, the experimental group had significantly [F (1, 26) = 4.81, p < 0.05] higher average kcal/kg of energy expended per day, as measured by an activity diary. Study findings support the potential benefit of an early recovery symptom management telehealth intervention, following CABG surgery, to improve the status for high risk patients related to their preoperative level of CAD burden.

Low-Density Lipoprotein Cholesterol (LDL-C) Levels and LDL-C Goal Attainment Among Patients Aged ≥65 Years Treated With Rosuvastatin Compared to Other Statins in Real-World Clinical Practice

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Objective: To compare change in LDL-C and National Cholesterol Education Program (NCEP) Adult Treatment Panel (ATP) III LDL-C goal attainment in a population of elderly patients treated with rosuvastatin (RSV) versus other statins. Methods: This was a retrospective analysis using claims data linked to laboratory results from a commercial and Medicare Advantage health plan. Patients ≥65 years of age and who were newly treated with statins (index date) August 1, 2003 to February 28, 2005 were included. Patients were followed from index date to therapy discontinuation or end of plan eligibility. Patients were assigned to NCEP ATP III risk groups (estimated based on patient data from 12-month index period) with associated LDL-C goals. Generalized linear modeling was used to compare % LDL-C reduction with RSV as compared to other statins. Logistic regression was used to estimate odds and predicted percent attainment goal among other statin users compared to RSV. Covariates in the analyses included baseline LDL-C, age, gender, risk status, and length of therapy. Results: Of the 2,227 elderly (mean age ≥ 73 years) new users of statin therapy, 1,788 (80%) started on RSV, 867 (39%) atorvastatin (ATV), 690 (31%) lovastatin (LOV), 302 (14%) simvastatin (SMV), 123 (6%) pravastatin (PRV), and 67 (3%) fluvastatin (FLV). Average dose of RSV, ATV, SMV, PRV, LOV, and FLV were 10.7 mg, 16 mg, 28.1 mg, 32.9 mg, 27.4 mg, and 66.5 mg, respectively. After controlling for covariates, RSV patients experienced a 35.8% decrease in LDL-C from baseline, significantly greater compared to ATP, SMV, PRV, FLV, and LOV (29.3%, 24.9%, 22%, 21.9%, and 22.5%, respectively; p < 0.001). After controlling for covariates, predicted percent attainment goal among RSV users was 75.6% among ATP patients, significantly greater compared to ATV, SMV, PRV, FLV, and LOV (81.2%, 72.8%, 64.1%, 68.6%, and 55.8%, respectively; p < 0.001). Conclusions: In patients ≥65 years of age, rosuvastatin results in significantly greater LDL-C reduction and higher NCEP ATP III goal attainment rates as compared to other statins in real-world clinical practice. The results will be useful to health plan decision makers in designing their Medicare Part D drug benefit and clinicians in selecting appropriate statins to meet individual care needs of older patients.

Comparison of Titration Rates of Rosuvastatin Compared to Other Statins in Routine Clinical Practice

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Objectives: According to recent studies, titration of statins occurs infrequently in clinical practice; hence this study was designed to assess any differences in low-density lipoprotein cholesterol (LDL-C) goal with rosuvastatin (RSV) have achieved this goal with fewer titrations compared with other monotherapy statins. Methods: Retrospective study using claims data linked to laboratory results from a national health plan (commercial and Medicare Advantage). Patients ≥18 years of age who were newly treated with low-density lipoprotein cholesterol (LDL-C) goal with rosuvastatin (RSV) have achieved this goal with fewer titrations compared with other monotherapy statins.

Stroke Rehabilitation and Systematic Care in Paul Coverdell National Acute Stroke Registry

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Background: Early assessment for and receipt of rehabilitation can improve stroke patients’ functional and social well-being. Yet, rehabilitation among stroke patients is underestimated. This study examines whether hospital characteristics related to systematic stroke care are associated with assessment and receipt of rehabilitation. Methods: We used data collected from the Paul Coverdell National Acute Stroke Registry from four states (GA, IL, MA, NC) in 2005–2006. We defined outcomes as whether rehabilitation need is assessed in hospital and whether eligible patients received rehabilitation. Hospital characteristics included presence of a written rehabilitation department policy, availability of physical and speech therapists, number of stroke patients from emergency medical services (EMS), a stroke team, a stroke unit, full-time services for physical therapy and speech therapy, and JCAHO certification. Using logistic regression, associations between hospital characteristics and outcome measures were assessed, controlling for patient demographics, NIH stroke scale score, stroke type and history of stroke and coronary artery disease. Subgroup analysis among ischemic stroke patients was also conducted. Results: Among all 4,387 stroke patients, 77.8% had rehabilitation assessments. Among 4,021 eligible patients, 63.5% received or were referred to rehabilitation services. Having an ED protocol, a written plan for EMS transfer and a stroke unit were all associated with higher probability of receiving assessment of rehabilitation (OR=2.0, 1.3, and 1.6, respectively; all p<0.05). Full-time services for physical therapy and speech therapy were also associated with rehabilitation assessment (OR=6.3 and 2.9, respectively; both p<0.001). Only speech therapy and JCAHO certification were associated with receipt of rehabilitation (OR=1.4 and 2.3, p<0.05). Similar findings were observed among the subgroup of ischemic stroke patients. Conclusions: The findings suggests that stroke patients treated in hospitals providing systematic acute stroke care are more likely to be assessed for and receive rehabilitation services. Having speech therapy services available also improves both assessment and receipt of rehabilitation.

Contemporary Patterns of Referral for Elderly Patients With ST-Segment Elevation Myocardial Infarction

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Background: Timely use of reperfusion therapy is recommended by the ACC/AHA guidelines and improves survival in elderly patients with ST-segment elevation myocardial infarction (STEMI). However, prior observational data show that <40% of eligible patients ≥75 yrs old receive reperfusion therapy; and only 10–30% undergo primary percutaneous coronary intervention (PCI). Methods: We evaluated reperfusion strategies and outcomes among 5,586 STEMI patients admitted to 210 hospitals participating in the CRUSADE National Quality Improvement Initiative between Sept. 2004 and June 2006. Results: Among 5,586 patients presenting with STEMI, 1266 (22.7%) were ≥75 yrs old. Compared with patients ≥75 yrs old, elderly patients more often had provider-documented contraindications to reperfusion (31.5% vs. 13.6%, p < 0.001), the former of which were not only reported contraindications, 77.1% of elderly patients who received reperfusion therapy vs. 89.9% of patients <75 yrs old (p < 0.001). This difference persisted after adjustment for patient and hospital characteristics (adjusted OR 0.88, 95% CI 0.79–0.98). Among elderly patients who received reperfusion therapy, the majority underwent primary PCI (97.4% vs. fibrinolytic therapy [72.6%]). Elderly patients also had longer times to first ECG (median 11 vs 8 min, p < 0.001), fibrinolytic administration (median 44 vs 33 min, p < 0.076) and PCI (median 110 vs 96 min, p < 0.001). Overall in-hospital mortality was higher in the elderly compared with patients <75 yrs old (12.6 vs. 2.7%, p < 0.001). Among elderly eligible patients, use of reperfusion therapy was associated with lower in-hospital mortality (6.1 vs. 18.9%, p < 0.001). Conclusions: Increased awareness of guidelines has positively influenced the delivery of reperfusion therapy, and PCI in particular, to elderly eligible patients. However, a significant portion of eligible elderly patients with STEMI still fail to receive life-saving reperfusion therapy and have longer time delays to reperfusion. The elderly remain an undertreated high-risk population that should be targeted in efforts to improve care.
Introduction: Cardiovascular disease (CVD) is the leading cause of death in the U.S. Healthy Heart (HH) is a twelve-month mail-based program which educates employees and their health care providers about ways to reduce cardiovascular disease risk. Objective: Measure 12-month LDL and blood pressure between Intervention and Control participants at two geographically adjacent sites (Intervention n=31, Control n=43). Methods: This is a non-randomized, controlled study comparing the impact of the HH program versus control (no disease management) in employees at two sites of a large company. Participants were screened and eligible employees were assigned to receive the HH program or to be a Control (cluster assignment at plant level). Results: Baseline, 4M and 12M LDL values for the Intervention group are 177.0, 101.8 and 110.5 respectively and for the Control group are 159.1, 128.4 and 135.6 respectively. Mean LDL group difference at 12M adjusted for baseline value, resulted in a p-value=0.02 and 4M mean LDL values adjusted for baseline value, p-value=0.04. Mean Sys/Dia at baseline, 4M and 12M were 133/83/1, 128/3/76.8 and 124/85/6.6 for Intervention respectively and for Control, 138/84/7, 129/5/79.8 and 134/0/1 respectively. Mean values of BP readings followed a trend similar to that found for mean LDL values, 12M group difference adjusted for baseline value with a p-value=0.04. For BMI, HDL and triglycerides, no differences between the two groups were detected. Conclusions: Findings show statistically significant improvements in cardiovascular health for Intervention participants with respect to mean LDL values and blood pressure readings.
Age, Presentation, and Emergency Department Diagnosis of Acute Coronary Syndromes: Results From CRUSADE

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Background: Elderly patients with acute coronary syndromes (ACS) often present differently than younger patients, but the impact of age differences in presentation on early diagnosis in the emergency department (ED) is unknown. Methods: Patients in CRUSADE (n=652, 211 sites) were randomly selected for chart abstraction for details of symptom presentation and ED diagnosis. Symptoms in younger and older patients (<75 vs. ≈75 years) were compared, and the association between age, symptoms and ED diagnosis of NSTEMI ACS (vs. other) was determined. Wilcoxon rank-sum tests were used for continuous, and chi-square test for categorical variables. Chest pain (CP), sex, age and race of patients were tested using logistic regression for independence as predictors of ED diagnosis of ACS. Results: A total of 182 (27.9%) patients were older (age ≈75 years), 339 (52%) had positive cardiac markers, 566 (86.6%) had CF, and 336 (51.5%) had ED diagnoses of ACS. Older patients more often came from a nursing home (10.4% vs. 7.0%, p<0.001), had new-onset dyspnea, other symptoms, and complicating factors (Table). However, younger patients had more CP and diaphoresis. Time from symptom onset to ED arrival (<6 hrs, 38.5 vs. 42.3%) and positive ED cardiac markers (58.7% vs. 50.6%, p=0.07) were similar across age. The elderly were more likely to have a specific ED diagnosis. A model testing cardiac markers, CP, age, and sex on ACS diagnosis found only CP to have an independent impact. Conclusions: Elderly patients are more likely to receive an ACS diagnosis in the ED, despite less CP. This suggests that while CP plays a dominant role in ACS diagnosis, ED physicians are aware of the higher cardiac risk in the elderly, and their atypical presentations.

Table 1: Comparison of Changes in the Determinants of Meta Synd for Low Participators and High Participators in a Community Based Weight Loss Program

<table>
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Conclusions: Elderly patients present differently when compared to younger patients. Elderly patients are more likely to receive an ACS diagnosis in the ED, despite less CP. This suggests that while CP plays a dominant role in ACS diagnosis, ED physicians are aware of the higher cardiac risk in the elderly, and their atypical presentations.
Reducing Door-to-Balloon Time in Patients Transferred From Rural Emergency Departments to a Tertiary Cardiac Center: Application of a Trauma System Model to Regional STEMI Patients

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Rapid transport of patients with acute ST segment elevation myocardial infarction (STEMI) for PCI has been shown to be superior to local thrombolytic therapy (TL) in several European trials. However, registry data suggests this strategy of regional transfer of STEMI patients is not optimally implemented in the US, with community emergency room to tertiary door-to-balloon times (regional DBT) averaging 180 minutes (NHQI 3/4 1999–2002). In 2005 we undertook an initiative designed to improve regional DBTs. This program included meetings between cardiologists, ED directors, and ED physicians concerning transfer protocols. Despite these initial efforts, our regional DBTs remained significantly higher than those achieved in European trials of regional transfer of STEMI, and were not significantly different from national NRMI STEMI transfer data. Methods: In 2008 an air medical transport physician championed a new regional PCI process. This included: 1) medication algorithm minimizing N infusions, 2) ED and flight team training using “golden hour” trauma philosophy, 3) local ED physician empowerment to activate the interventional cardiology and air transport teams simultaneously, and 4) immediate and quarterly performance feedback, DBT and relevant time intervals were compared for patients transferred in 2006 with those from 2005. Results: In 2005, 39 STEM patients (22 primary and 17 rescue) were transferred for PCI while 59 patients (50 primary and 9 rescue) were transferred in 2006. Improvements were observed in primary time intervals in 2006 including: median door-to-door time from 37 to 16 minutes (p = .001); air-medical ground time from 30 minutes to 19 minutes (p = .0001); air-to-balloon inflation time from 46 to 36 minutes (p = .0033), and regional DBT from 171 to 120 minutes (p = .0001). Improvements in regional DBT were observed in the primary PCI (167 minutes to 120 minutes, p = .0001) and rescue PCI (183 minutes to 137 minutes, p = .0132). Conclusion: QI initiatives championed by a flight physician resulted in a significant reduction in regional DBTs. In contrast, QI limited to educational programs and protocols by interventional cardiologists had little impact in our region.

Impact of Race and Age on 6-Month Outcomes Among Veterans Undergoing Percutaneous Coronary Interventions

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Background: Studies regarding the impact of race and age on outcomes after percutaneous coronary intervention (PCI) in the era of drug eluting stents (DES) are limited. Concerns about complications influence decisions regarding revascularization strategies. We sought to review the impact of age and race on freedom from adverse cardiac events at six months following percutaneous coronary intervention (PCI). Methods: We performed a retrospective study analyzing 356 consecutive patients who underwent PCI at an inner-city VA medical center from 9-2004 to 5-2006 with 95% use of DES. We evaluated the rates of major adverse events at 6 months after stratifying by age (> 65, n = 163) and race (African American (AA) n = 190 and Non-African American (NAA) n = 166). Major adverse events included all-cause mortality, recurrent MI, need for repeat revascularization, cardiac related hospitalization and combined MACE. Results: Overall, 73 (20.5%) patients required cardiac related hospitalization. 41 (11.5%) had ischemia driven interventions, 7 (1.9%) had a MI, and 14 (3.9%) people died. There was a statistically significant difference (p <0.05) in mortality among NAA > 65 compared to NAA > 65 but no difference in mortality AA regardless of age. Conclusion: In this modern era of DES, race had a no impact on outcomes 6 months post PCI. One explanation for this finding could be improved access to health care and medications for minorities in the VA system. However, with a low overall event rate larger trials are needed. As expected, older patients had a higher overall mortality.

High Physical Functioning Is Associated With Decreased Adherence Among Urban African-Americans With Severe, Uncontrolled Hypertension

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Poor adherence may contribute to the burden of uncontrolled hypertension among urban African Americans. In inner-city environments, a strong perception of need for treatment may be required to maintain adherence due to barriers such as poverty and lack of insurance. Perception of need is often dictated by level of physical functioning. Therefore, we hypothesized that urban African Americans who report a high level of physical functioning will be less adherent to antihypertensive medications. We prospectively identified African-Americans admitted to the medical service at Johns Hopkins from 1998–2004 whose admission blood pressure was greater than 180/110, excluding those with a secondary cause of hypertension. We reviewed medical records and interviewed 193 consecutive patients about their history of hypertension, adherence to medications, and access to care. We used the Physical Component Summary (PCS) of the SF-36 Health Survey to assess level of physical functioning in 148 participants. Adherence status on hospital admission was based on a validated question (correlation of responses with urinary cotinine levels was r = 0.30). The association of physical functioning and adherence was essentially unchanged after adjustment for age, gender, income, education, employment status, tobacco or illicit drug use, insurance status, and median household income. These results suggest that urban African-Americans who report feeling physically well are less likely to adhere to their antihypertensive regimen. These individuals’ perception of need may not be strong enough to overcome barriers to care and other chronic stressors present in urban environments.

The Causes of Missed Opportunities for Reperfusion in ST-Segment Elevation Myocardial Infarction

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Background: Despite strong evidence supporting the efficacy of reperfusion therapy in patients with ST-segment elevation myocardial infarction (STEMI), the reasons for the under-use of this potentially life-saving treatment remains poorly characterized. The aim of this study was to identify the patient factors associated with the failure to receive reperfusion. The ED records and electrocardiograms of those not receiving reperfusion were reviewed to identify and categorize the reasons this therapy was not provided. Results: Of 460 ideal reperfusion candidates, 102 (22%) did not receive a fibrinolytic drug or undergo percutaneous coronary intervention. Independent patient predictors of failure to receive reperfusion included older age, peripheral vascular disease, and atypical symptoms. In cases where reperfusion was not provided, three categories of explanations were identified: 1) inadequate documentation of guideline-based rationale for withholding therapy (53%, 54 of 102); 2) failure to identify pathological ST-segment elevation (34%, 35 of 102); and 3) failure to consider left bundle branch block as an indication for reperfusion (13%, 13 of 102). Conclusions: Nearly one-quarter of ideal candidates presenting to the ED with STEMI in this cohort did not receive reperfusion therapy. This study suggests that improving the interpretation of the ECG and an enhanced understanding of the indications for reperfusion may improve the delivery of reperfusion to eligible candidates and potentially improve STEMI outcomes.

Prevalence and Predictors of Persistent Use of ACE inhibitors, Beta-Blockers, and Statins During 12-Month Follow-Up After Hospitalization for Acute Coronary Syndrome, 1999–2000

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Objectives: We examined the prevalence and predictors of persistent use of common secondary preventive therapies (ACE inhibitors, beta-blockers, and statins) during the 12-months following hospitalization for acute coronary syndrome (ACS) during 1999–2000 in order to establish baseline data for later year comparisons to treatment guidelines. Methods: Claims data from Kaiser Permanente Northern California (KPNC) were examined. Patients age ≥40 were identified with primary discharge codes for ACS and had ≥6 months KPNC membership post-hospitalization. Persistent use was defined as prescriptions which covered at least 90% of the follow-up period. Results: Of 12,036 patients hospitalized for ACS, any use of ACE inhibitors, beta-blockers, and statins was recorded in 53.9%, 83.6%, and 44.4% of patients, respectively; persistent use occurred in 28.5%, 50.7%, and 47.8%. Clopidogrel use was not yet widespread during this period with 32.8% of patients receiving it. Multivariable analysis results are shown below. The largest direct relationships were present for diabetes with ACE inhibitors; hypertension with ACE inhibitors; hyperlipidemia and statins. Largest inverse associations were present for age and statins; diabetes and hypertension with statins. Relative
to whites (data not shown), Asians were less likely to be statin users.

Hispanics less likely to be statin users.

Conclusions: Negative emotional states, including depression, are common in myocardial infarction (MI) patients and are associated with poor health status. In contrast, optimism is a "positive" state that has been linked to favorable coping mechanisms and reductions in stress. We sought to explore whether optimism at the time of an MI is associated with better health status 1 year after Methods: PREMIE is a prospective, multi-center, observational study that followed 2,496 MI patients from 19 U.S. centers. Optimism was assessed during patients' hospitalization with the Life Orientation Test-revised (LOT-R). LOT-R scores range from 0–24. Higher scores represent optimism, while lower score represent pessimism. General health status outcomes were measured with the 12-item Short Form Health Survey mental component (SF-12 MCS) and physical component scores (SF-12 PCS).

The presence of angina (yes/no) and disease specific quality of life were assessed with the Seattle Angina Questionnaire (SAQ). Multivariable models adjusted for baseline health status, site and numerous demographic, clinical and treatment characteristics as well as depressive symptoms and social support. Risk adjusted results are presented. Results: Of the 2,496 MI patients enrolled in PREMIE, 1,639 (76%) had complete baseline and follow up interviews. Although only a trend between baseline optimism and less angina at 1-year was seen (adjusted HR 0.85 per 1-unit increase in LOT-R, 95% CI 0.78–1.00), higher levels of optimism were strongly associated with better SAQ-quality of life (Beta 2.13, 95% CI 0.95–3.30, p-value <0.001), SF-12 MCS (Beta 0.77, 95% CI 0.19–1.35, p-value <0.001), and SF-12 PCS (Beta 1.09, 95% CI 0.39–1.79, p-value <0.001) at 1-year. Conclusion: This study shows that optimism is an important attribute that is associated with better long-term health status after an MI independent of known adverse psychosocial risk factors. Future studies should explore interventions to determine whether modifying optimism will improve outcomes for more pessimistic MI patients.

Does Poor Access Increase Mortality Among Severely Hypertensive African Americans?

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African Americans, especially those living in our urban centers, die earlier than other Americans. Poor access to care may contribute to this excess mortality. In order to characterize the relationship between access and mortality in this high-risk group, we conducted a longitudinal cohort study of inner-city African Americans with severe, uncontrolled blood pressure. We reviewed medical records and interviewed 193 consecutive African Americans admitted to an inner-city academic hospital from 1999 to 2004. Hypertension was defined as a blood pressure of greater than 180/110. Average age on admission was 50.7 yrs (range 27.5 – 88.8), 51.3% were women, 52.3% had completed high school, 69.3% were unemployed and average monthly income was $2,685 (SD $1,075). Despite the severity of their illness, only 67% were insured and only 24% had full prescription coverage. 5-year mortality was 40% (82 deaths). Average age at death was 54.4 yrs (range 31.2 – 92.9). In proportional hazards models adjusting for age, sex, and comorbidities, the mortality hazard ratio among the employed (full or part-time) compared to the unemployed was 2.89 (95% CI 1.43–5.61). Those with difficulty reaching and trouble getting through at the doctor's office had a mortality hazard ratio twice as great as those without such difficulties (HRs 2.1, p-values 0.03). A highly level of income was protective (HR 0.91 95% CI 0.84–0.98 for $100 increase). Among those with insurance, the hazard ratio associated with self-reported inability to pay for medications was 1.98 (95% CI 1.00–3.75). Conclusion: Inner-city African Americans suffer excess mortality from treatable conditions such as hypertension. Several factors related to poor access may contribute to excess mortality in this vulnerable population.

Does an Adverse Drug Reaction to Clopidogrel Predispose Patients to a Myocardial Infarction

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Introduction: Negative emotional states, including depression, are common in myocardial infarction (MI) patients and are associated with poor health status. In contrast, optimism is a 'positive' state that has been linked to favorable coping mechanisms and reductions in stress. We sought to explore whether optimism at the time of an MI is associated with better health status 1 year after Methods: PREMIE is a prospective, multi-center, observational study that followed 2,496 MI patients from 19 U.S. centers. Optimism was assessed during patients' hospitalization with the Life Orientation Test-revised (LOT-R). LOT-R scores range from 0–24. Higher scores represent optimism, while lower score represent pessimism. General health status outcomes were measured with the 12-item Short Form Health Survey mental component (SF-12 MCS) and physical component scores (SF-12 PCS).

The presence of angina (yes/no) and disease specific quality of life were assessed with the Seattle Angina Questionnaire (SAQ). Multivariable models adjusted for baseline health status, site and numerous demographic, clinical and treatment characteristics as well as depressive symptoms and social support. Risk adjusted results are presented. Results: Of the 2,496 MI patients enrolled in PREMIE, 1,639 (76%) had complete baseline and follow up interviews. Although only a trend between baseline optimism and less angina at 1-year was seen (adjusted HR 0.85 per 1-unit increase in LOT-R, 95% CI 0.78–1.00), higher levels of optimism were strongly associated with better SAQ-quality of life (Beta 2.13, 95% CI 0.95–3.30, p-value <0.001), SF-12 MCS (Beta 0.77, 95% CI 0.19–1.35, p-value <0.001), and SF-12 PCS (Beta 1.09, 95% CI 0.39–1.79, p-value <0.001) at 1-year. Conclusion: This study shows that optimism is an important attribute that is associated with better long-term health status after an MI independent of known adverse psychosocial risk factors. Future studies should explore interventions to determine whether modifying optimism will improve outcomes for more pessimistic MI patients.

A Pharmacist-Directed Multidisciplinary Approach to the Treatment of Acute Ischemic Stroke With Thrombolytic Therapy

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In June, 2002 a Stroke Response Team (SRT) was developed at Spectrum Health (SH) consisting of a pharmacist, neurologist, emergency department (ED) physician and nurse. Following FDA approval of alteplase (tPA), the neurologists requested assistance from the pharmacy department with patient assessment and drug delivery. Pharmacists were educated and certified in NIH stroke scale, had to remain within 20 minutes of the hospital, were given stroke pagers, and asked to act as a key team coordinator with the goal of efficient protocol adherence. For the year prior to the SRT, 2/538 (0.3%) patients admitted to SH with ischemic stroke received tPA. In 2004, SH was certified by AHAo as a Stroke Center. Also in 2004, a satellite pharmacy was added to the ED, which is staffed by a pharmacist 24 hours per day, 7 days a week. Working with the ED physician and staff, stroke patient responsibilities were extended to the ED pharmacist, who coordinates patient care related to evaluation of thrombolysis in all patients experiencing an acute ischemic stroke. The pharmacist takes part in rapid assessment and history, defines the onset of symptoms, performs the NIHSS on patients throughout the hospital, discusses the patient with the neurologist on-call, assists in decisions to give thrombolitics, drug preparation, quality database management, provides continuing education, and serves on quality improvement teams. With the SRT in place, SH has been able to treat almost every ischemic stroke patient who is tPA eligible. From July, 2002 through December, 2006 SH's patients with treated with tPA, The incidence of symptomatic ICH within 36 hours of treatment with tPA in patients with NIHSS <22 is 5/87 (5.7%) at SH, which is similar to that found in the NIH trial.

Preference-Based Health Measures of New-Onset Atrial Fibrillation in the FRAGMENT Registry

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Objectives: Utility weights for AF patients are not presently available. We sought to further characterize QoL in AF based on a preference-based utility measure for future use in economic evaluations. Methods: We collected QoL data on 963 patients with new onset AF in a multi-center observational registry. The SF-6D index was calculated from the SF-12 scores, however recurrence rates were relatively low in this population.

Treatment of AF is associated with improvement in preference-based quality of life. In a continuing education, and serves on quality improvement teams. With the SRT in place, SH has been able to treat almost every ischemic stroke patient who is tPA eligible. From July, 2002 through December, 2006 87/2000 (4.2%) of patients have been treated with tPA. The incidence of symptomatic ICH within 36 hours of treatment with tPA in patients with NIHSS <22 is 5/87 (5.7%) at SH, which is similar to that found in the NIH trial.
Patients Who Do Not Fill Prescribed Antihypertensive Medications: The Effect of Age, Blood Pressure, and Specialty Care

Background: hypertension control is dependent upon the patient using an antihypertensive medication (AHM) prescription given by the physician. We examined the association of AHM filling with blood pressure at a visit, patient age, and specialty care. Methods: From 6 primary care clinics in an academic center from 1/1/03–2/1/05, we identified 327 African-American patients enrolled in a Medicare managed care plan with full drug coverage. AHMs prescribed by primary care physicians were identified from the electronic medical record (EMR) and were merged with concurrent AHM managed care claims. The outcome was filling the AHM based on a claim within 30 days. The blood pressure (BP) at the most recent visit was categorized as: controlled (<140/90 or if diabetic <130/85), high systolic or diastolic only, both elevated, or severely elevated (>90 or >159). A cardiologist or nephrologist defined specialty care. We used generalized estimating equations to account for clustering of prescribed AHMs within patients. Adjusted analyses account for demographics, management of hyperlipidemia, and cardiac and non-cardiac comorbidities.

Results: Of 1,742 prescribed AHMs, 25% were not filled. More than half of the AHMs (54%) were prescribed by a cardiologist or nephrologist. Patients receiving care from a cardiologist or nephrologist had more comorbidities than those without non-cardiac comorbidities. Before adjustment, AHM filling was more likely for specialty care (unadjusted odds 1.41, CI 0.97–2.05) but the fully adjusted odds ratio (AOR) was 1.11 (CI 0.75–1.68). After adjustment using controlled BP as the reference, filling was more likely if the BP was severely elevated (AOR 1.68, CI 1.17–2.41) but less likely if only the diastolic was increased (AOR 0.64, CI 0.41–1.00). Persons aged <50 were 40% less likely to fill AHM (AOR 0.59, CI 0.37–0.92). Conclusions: Failure to fill AHMs was common in our minority patients but even more likely for younger persons and those with isolated high diastolic BP. Further studies need to identify patterns of non-adherence, e.g., poor medication adherence for provider-related (e.g., limited instructions) barriers to filling AHMs. Both specialists and primary care physicians may need to develop interventions to improve patient filling and subsequent adherence to AHMs.

Sex Differences in Evaluation and Treatment After Exercise Stress Testing
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Background: Following exercise stress testing (ETT), women may not be treated as aggressively with diagnostic tests and preventative medications compared with men. Methods: We evaluated 200 consecutive cases of ETT in 192 men (94.3% men, 5.7% women) and 56 patients with a history of hypertension, hyperlipidemia and stroke. During ETT, women achieved lower proportional age and gender-specific METs (101.8% vs. 105.6%, p < 0.001) and more often experienced chest pain (10.3% vs. 6.6%, p < 0.001) or ST-segment changes (19.4% vs. 17.4%, p = 0.02). In the 6-months after ETT, women less often underwent angiography, revascularization, and were less likely to receive a new prescription for ACE inhibitors, beta-blockers, or statins. In the multivariable analyses, the relationships remained significant. (Table) Conclusions: Women are significantly less likely than men to undergo cardiac procedures or receive preventative therapies after ETT, even though women were more likely to have abnormal ETT results. Future studies should further investigate whether these management differences explain sex disparities in cardiovascular disease outcomes.

Inter-Observer Agreement of Clinical Echocardiographic Studies: Establishing Benchmarks for Quality
Jersey Chen, Lawrence Markson, Susan B Yeon, Warren J Manning; Beth Israel Deaconess Med Ctrn, Brookline, MA

Background: Little is known about inter-observer agreement of clinical echocardiographic studies, a proposed measure for quality assessment in care. Traditionally, it can identify areas for quality improvement is unknown. Methods: Agreement data from 4196 transthoracic and transesophageal clinical echocardiograms with prior clinical studies were analyzed from a single medical center over 26 months. Studies were reviewed by ASE Level III Echo trained staff who each perform >900 studies/year (median 2395y). Staff interpreting the most recent echocardiogram also reviewed the prior study and report and rated their level of agreement with the prior study interpretation as: 1) in agreement, 2) in minor disagreement, 3) in major disagreement, or 4) unable to comment since prior images not available for review. Results: Overall, 2381 (56.7%) of prior study images and reports were available for review, including 2058 (86.4%) identified as in agreement with the prior interpretation, 285 (12.0%) in minor disagreement, and 38 (1.5%) in major disagreement. Across 7 readers of the initial (prior) echocardiogram, the proportion of studies with major disagreements ranged from 0–4.3% (median 1.0%) and those with minor disagreements ranged from 6.7–20.2% (median 12.1%). Table The reader with the highest major disagreement (4.3%) had the highest minor disagreement (20.2%). Conclusion: Inter-reader agreement for interpretation of serial echocardiograms varies and can identify areas for quality improvement. While it is not known whether these levels of disagreement represent high, adequate or low quality, these data form an important starting point for quality benchmarking.

Medication Use Post Acute Myocardial Infarction: A Latent Class Analysis
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Background: Prior studies have shown that a significant proportion of patients do not adhere to secondary prevention regimens after an acute myocardial infarction (AMI) and that these patients have worse outcomes. We explored patterns of, and factors associated with, using prescribed secondary prevention medications 6 months after AMI hospitalization. Methods: We analyzed data from 1922 AMI patients discharged to home in the 19-center PREMIER study. Latent class analysis (LCA) was used to classify patients according to patterns of 6-month usage of 4 discharge medications. Results: Using LCA, we identified 2 very distinct patterns of medication use: (1) low usage of all medications and (2) high usage of all medications. Predictors of class membership were examined, including demographic, clinical, treatment, socioeconomic and post-discharge factors. Results: LCA identified 2 very distinct patterns of medication use: (1) those taking very few or none of their prescribed medications (13%), (2) all patients (87%), termed ‘poor users’ and (2) those with high usage (86%), (2) of patients of prescribed medications. Usage (low or high) was consistent across all 4 medications. Patients with poor usage were more likely to be older, non-Caucasian, have a low education level, prior stroke, not be revascularized, not taking aspirin prior to AMI and to have no provider follow-up or cardiac rehabilitation in 1st month after discharge (p < 0.01). Conclusions: Medication use 6 months after AMI tends to follow 2 distinct patterns: poor or high usage of all 4 medications. A better understanding of the factors associated with these patterns can lead to interventions that optimize medication usage, and, presumably, patient outcomes after AMI.
Angina Following Revascularization: Frequency and Patient Risk Factors

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Background: Angina may be relieved by medication or by revascularization, typically CABG or PCI plus stenting procedures. Over time, restenosis, disease progression or lesions that cannot be revascularized lead to recurrent angina in some patients. This study looks at characteristics which put a patient at risk for recurrent angina and the frequency and timing of recurrent angina following revascularization in a large managed care population. Methods: Patients enrolled in a national managed care plan with a claim for a CABG, PCI or stent from 01/01/2003 to 12/31/2005 were selected if they were 35 years of age or older, and had a claim for a revascularization procedure in the year following their procedure. Patients were followed for one year after their index procedure for medication use, angina diagnosis by ICD-9 code and additional revascularization procedures. Results: Following selection criteria 18,240 patients were eligible for analysis. The average age was 59 years, with 25% age 65 years and older. Most patients were male (76%). Of the 18,240 patients, 46% (8420) experienced angina (identified by angina diagnosis and/or two or more nitrate prescriptions) within a year following their index revascularization procedure. Of those patients experiencing recurrent angina, approximately a third (30%/2904) had another revascularization procedure in the year follow up period. The average time from initial procedure to second procedure, after recurrent angina diagnosis, was 73 days, although there is a wide range among patients (SD—103 days). Risk factors for having angina following a revascularization procedure were younger age, female gender and having a PCI without a stent. Conclusion: Angina recours in nearly half of patients in the year following a percutaneous or surgical coronary procedure. A third of patients experiencing angina have a second procedure after experiencing recurrent angina. Factors such as microvascular disease, multiple vessel disease and disease progression can lead to some patients experiencing recurrent angina even in the year following a revascularization procedure. Recurrent angina and subsequent revascularizations in previously revascularized patients can be seen to have major resource utilization and cost implications for managed care.

Angina Predicts Poor Adherence to Risk Reducing Recommendations After Myocardial Infarction: Are Women Who Live Alone Particularly Vulnerable?

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Introduction: Negative emotions following MI predict negative outcomes, such as cardiac events and poor quality of life, and are associated with decreased adherence to medical regimens. Adherence is a vital component to post-MI recovery, and has been associated with reduced mortality. In contrast to post-MI depression, the relationship between anxiety and adherence in this setting is understudied and the objective is to clarify the impact of anxiety on adherence. Methods: Patients (N = 279) hospitalized for MI completed measures for adherence to the following health behaviors: angina medication, cholesterol and lipid-lowering medicine, antihypertensive, antidepressant, and diabetes medication. Pts were defined to be secondary risk, have more lipid abnormalities, and less likely to be diabetic. Treated pts, age 35.9 ± 10.7 yrs, with poor adherence and greater anxiety at T1. One out of every three women in the sample lived alone, more than twice as many women living alone (n = 41) than men (n = 20); χ² (p = 0.001). A mediation analysis found that gender significantly and fully mediated the effect of living alone on anxiety, such that living alone was only significantly associated with female gender. Another set of mediation analyses found that anxiety fully mediated the effects of living alone on adherence to low fat diet, reduced sodium intake, and medication compliance. Anxiety was associated with both living alone and poor adherence, but after controlling for the mediation of anxiety, living alone did not retain a significant association with adherence. Conclusions: In this sample, anxiety was associated with poor compliance with cardiac risk-reducing recommendations at 4 months post-MI. Women, especially those living alone, may be particularly vulnerable to anxiety and its effects. Female patients and patients living alone may benefit from interventions that improve adherence (e.g., problem-solving strategies, enhanced social support). Although these data suggest a relationship between gender, living alone, anxiety, and adherence, the direction of causality cannot be assumed. The relationship of anxiety with adherence suggests the utility of psychological screening following MI.

Cardiovascular Risk in Young Apparently Healthy Descendents From Asian Indian Migrants in the Netherlands: The SHIVA Study


Objectives: First and 2nd generation Asian Indian migrants in the Western world are highly susceptible for ischemic heart disease. For optimal prevention, knowledge of the cardiovascular risk profile of younger generations is crucial. We assessed the cardiovascular risk profile in asymptomatic 2nd to 7th generation Asian Indian descendants, and compared the results with currently applied in Europeans.

Methodologies: A retrospective cohort analysis of a CPM (n = 4262) and GSPM (n = 31306), GSPMC (n = 3934). All pts had a lipid panel (LP) between 1/1/00 - 12/31/03 and were defined to be primary or secondary risk based on ICD-9/CPT codes and pharmacy records. Pts from GSPM and GSPMC had a minimum 52 week health plan follow-up post-base period. Initial LP values were based on NCEP ATP III goals and AHA recommendations for women. Laboratory values, drug therapy and cardiovascular (CV) events were assessed from the time of the initial LP test for a follow-up of up to 5 years. Mean CV event costs were estimated from a managed care database with a sum of CV events and associated hospital / pharmacy costs. CV events and lipid drug costs were then estimated to match each pt within this study. Lipid treatment was assumed to last for the duration of one year and pts contributed a maximum of one CV event. Results: CPM pts were more likely to have the following risk factors: hypertension, hypercholesterolemia, diabetes, body mass index and lower HDL levels than the Dutch. Glucose intolerance was present in 7.1% vs. 0.5% men, and 6.1% vs. 1.4% women (both p < 0.001). Asian Indian women were more frequently obese (12% vs. 5%; p < 0.001), and central obese (44% vs. 25%; p < 0.001) as compared to the Dutch women. Prevalence of most of the conventional and modifiable cardiovascular risk factors in each 10-year age group was higher in Asian Indians compared to controls, which reflected in higher Framingham risk scores. Twenty percent of smoking Asian Indian men aged 50–55 years had a risk ≥10%. In the age group 50–54 years all of the smoking men had a 10-year risk >10%, and 77% had a risk >20%. In smoking Asian Indian women between 40 and 44 years 29% had a 10-year risk >10%, this was all above the age of 50 years. Conclusion: This study confirms the persistence of a strikingly unfavourable cardiovascular risk profile in 3rd-7th generation Asian Indians. These observations support an aggressive screening and intervention strategy in this high-risk population to prevent subsequent cardiovascular events and to improve their long term prognosis. Furthermore these strategies should focus on younger age groups than currently applied in Europeans.
177 Patient Satiation With a Single-Pill Treatment of Hypertension and Dyslipidemia

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Background: Poor adherence to treatment contributes to lack of goal attainment in patients with hypertension and dyslipidemia. Patients satisfied with their treatment are more likely to be adherent and behave in ways that improve or maintain their health. This study assessed patients’ satisfaction with a single pill (amlodipine/atorvastatin) to treat hypertension and dyslipidemia. Methods: Patients were administered the Expectations and Satisfaction with Treatment Questionnaire Short Form (ESTQ-SF) at baseline and follow-up visits as part of the JEWEL trials; two multi-centre, open-label, titration-to-goals studies in patients with hypertension and dyslipidemia (N = 2225). Patients were grouped according to their treatment history (hypertension, dyslipidemia, hypertension & dyslipidemia, treatment naive). Psychometric analyses were performed on the ESTQ-SF satisfaction and expectation subscales. Mixed models were used to assess the significance of changes in satisfaction scores over time and to assess differences based on treatment history. Results: Internal consistency of the satisfaction scale was high (alpha = 0.77). Test-retest reliability ranged from 0.53 to 0.61 across treatment history groups. Patients’ level of satisfaction with their pill burden significantly increased when switching or incorporating amlodipine/atorvastatin into their treatment regimen at the first follow-up visit and was maintained throughout follow-up. A significant increase in satisfaction was observed across all groups (p < .001). Conclusions: The ESTQ-SF demonstrates adequate reliability and is sensitive to changes in treatment satisfaction in patients treated with amlodipine/atorvastatin. Further, these findings suggest that a single pill treatment for hypertension and dyslipidemia increases patient satisfaction, an important determinant of adherence with therapy and ultimately blood pressure and LDL-cholesterol control.

178 Female Gender is Associated With Higher Comorbidity and Lower Treatment Intensity in Patients Presenting With Acute Coronary Syndromes (ACS): Insights From the TRACS Registry

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Background: Gender-based differences in ACS presentation and therapy have been noted, but the nature of the disparities remain ill-defined. We explored the interactions between gender, clinical characteristics and ACS therapy in a large, multicenter registry experience. Methods: The Registry of Acute Coronary Syndromes (TRACS) comprises 3468 consecutive pts (3397 with complete information) admitted with ACS to 9 U.S. hospitals over 21 months. Pts were dichotomized by gender and multivariate regression models constructed to examine the relationships between baseline/risk variables and ACS therapy. Results: Of 3397 pts (1304 women), significant presentation and therapeutic differences were noted between women and men in the final multivariate model (Fig. 1). Women were older (>75 yrs), more often dyslipidemic and less often had prior MI. There was a trend towards more diabetes in women and a significant interaction between gender and Black race. Despite higher TIMI scores, women were less likely to receive early β-blockers or undergo revascularization with a trend toward less acute heparin use. Women received less lipid therapy but more ACE-I at discharge. In univariate analyses, significantly fewer women received GP IIb/IIa antagonists and went to coronary angiography later than men. Conclusions: Clear disparities were seen in ACS presentation profiles of women vs men. Despite increased incidence of high-risk features, women were less likely to receive key ACS therapies after adjustments for clinical and risk covariates. Further analyses of clinical outcomes ascribable to gender-based therapy disparities and interactions between gender, race and outcome are ongoing.

179 Quality of Life for Drug-Eluting Stent Recipients: Are They Reevaluating Revascularization Valued?

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Background: Clinical trials have consistently demonstrated that the primary benefit of drug-eluting coronary stents (DES) is in reducing repeat target vessel revascularizations. The cost of DES exceeds that of bare metal stents by approximately $1500 per stent. Thus, an improvement in the cost-effectiveness of DES critically depends on the quality-of-life (QOL) decrement experienced by repeat revascularization patients, yet this value has not been well quantified. Methods: We surveyed a random sample of patients who had undergone percutaneous coronary interventions in the University of Pennsylvania Health System from 2003–2005. Patients who had undergone repeat revascularization procedures were compared with those who had undergone only a single procedure. We assessed current QOL using the EuroQoL and Seattle Angina Questionnaire (SAQ). In order to estimate the value of an avoided target vessel revascularization, we also administered six Likert-scale questions (the Repeat Revascularization QOL Assessment, RRQA) measuring the emotional, physical, and social burdens of repeat revascularization either as actually experienced by repeat procedure recipients or as anticipated by single procedure recipients. Results: Thirty-three repeat revascularization patients and 36 single revascularization patients were interviewed. The RRQA had a Cronbach’s α of 0.84, indicating high reliability. Results of the EuroQoL (range 0–1), SAQ subscales (range 0–100), and RRQA (range 0–24) are tabulated below (data are median, interquartile range unless otherwise indicated). Conclusions: Respondents reported, on estimated, modest, short-term QOL decrements from repeat revascularizations. There was no permanent QOL decrement among patients who had received more than one revascularization. Since avoiding a QOL decrement from a repeat revascularization is the principal benefit of the DES, it is not clear that the higher cost of DES justifies any health benefit associated with this procedure.

180 Differences in Subspecialty Co-Management of Cardiovascular Disease by Race, Ethnicity, Gender, Insurance Status, and Site of Primary Care

Nakela L Cook, John Z Ayanian, LeRoi S Hicks; Harvard Med Sch, Boston, MA

Background: For patients with CAD and CHF, co-management between cardiologists and generalists improves outcomes. However, little is known about differences in likelihood of consultation by race, gender or insurance status. We examined differences in co-management with disparities in quality of care. Methods: In a retrospective cohort we examined 23,799 electronic records of adults with CAD or CHF receiving primary care at hospital or community-based practices affiliated with two medical centers in Massachusetts from 2000–2005. Using logistic regression, we assessed gender, racial, and ethnic differences in referral after adjusting for sociodemographic characteristics and site of care; we also modeled the impact of consultation on quality. Results: In the cohort, 56% (13,232) had a visit with a cardiologist, 82% (19,547) received primary care in hospital practices, 80% were White (19,148), 8% Black (1,842), 7% Hispanic (1,771), and 57% (13,529) men. In unadjusted analyses, women had lower consultation rates than men, 46% (4,688/10,270) vs. 63% (8,544/13,529), P < 0.001. The uninsured were less likely to receive consultation than the privately insured, 44% (494/1,131) vs. 52% (5,260/10,093), P < 0.001. Hispanics had lower consultation rates than Whites, 52% (818/1,771) vs. 56% (10,757/19,148), P = 0.001. Patients at community practices were less likely to receive consultation than those at hospital practices, 42% (1,788/4252) vs. 59% (11,444/19,547), P < 0.001. After adjustment, gender, insurance, and site of care disparities persisted. Co-management improved documentation of blood pressure (65% (8,551/13,232) vs. 62% (6,550/10,567), p < 0.001), measurement of lipid levels (73% (9,662/13,232) vs. 59% (6,198/10,567), P < 0.001. The uninsured were less likely to receive consultation than the privately insured, 44% (494/1,131) vs. 52% (5,260/10,093), P < 0.001. In unadjusted analyses, women had lower consultation rates than men, 46% (4,688/10,270) vs. 63% (8,544/13,529), P < 0.001. Conclusions: Among patients with CAD and CHF, 56% received cardiology consultation and rates differed by ethnicity, gender, insurance status, and site of care. Lower consultation rates for Hispanic patients were mediated by sociodemographic factors and site of care. Co-management with improved processes and outcomes of care, underscoring the importance of reducing such disparities in access to specialty care.

181 Quality of Comprehensive Care for Multi-Factorial Cardiovascular Risks Falls Short of Recommended Guidelines

Sarah C Shih, Sarah H Scholle, NCQA, Washington, DC; Simon Tang, David Schauf, Henry Solomon, Pfizer, Inc, New York, NY; L. Gregory Pawlson; NCQA, Washington, DC

Research objective: Hypertensive patients are often at elevated cardiovascular (CV) risk due to the presence of additional risk factors. Health plan performance measured by HEDIS® currently does not assess whether CV risk factors are managed concomitantly. In this study, we examine the management of patients with hypertension (HTN) and co-morbid CV conditions in a cohort of Medicare Advantage enrollees with pre-existing and/or new HEDIS® measures that are more stringent and in alignment with recent JNC 7, ADA, NCEP-ATP III guidelines for treating patients with diabetes and other CV risks. Methods: A cross-sectional analysis of administrative and chart data from 24 volunteer health plans nationwide was conducted to identify 9,109 persons with a HTN diagnosis. Cohorts of patients identified based on race, gender, and insurance status were divided into non-controlled and controlled (0 – 4,681). Achievement of prior HEDIS® thresholds (BP < 140/90mmHg, HbA1c < 9.0, and LDL < 100 mg/dL) and new HEDIS® measures (130/80 mmHg, HbA1c < 7.0) is presented. Results: Fifty-five percent of the patients were ages 60 years or older, 53.4% were women, and 77.6% reside in the Southern US. 75% of HTN patients had at least one co-morbid diagnosis. Only 51% had documentation of all relevant lab values. Patients with HTN and CV disease were more likely to meet the BP threshold of 140/90 mmHg but fewer than half of eligible patients met criteria for all thresholds. (See Table 1). Discussion: While about two thirds of patients meet the blood pressure threshold of <140/90 mmHg, fewer than half of patients with multiple risk factors are controlled particularly for thresholds defined by newer clinical treatment guidelines. In addition to individual measures, a composite metric including BP, HbA1c, and LDL values, for the majority of patients with hypertension who actually have multiple CV risks may be useful in tracking control and managing their overall CV risk. In addition, these data highlight the need for a more comprehensive CV risk management approach for patients with HTN.
Concomitant Prescribing Rates of Statins and Cytochrome P450 3A4 Inhibitors and Inducers for Older Patients (≥65 years of age) in Real-World Clinical Practice

Michael Davidson, Radiant Rutch, Chicago, IL; Sanjay K Gandhi, Eileen E Ming, Xiongkan Ke, Deborah Anzalone, AstraZeneca, Wilmington, DE; James M McKenney; National Clinical Rutch, Richmond, VA

Background: There may be an increased risk of adverse events or a decrease in statin effectiveness when certain statins are used concomitantly with Cytochrome P450 (CYP450) 3A4 inhibitors or inducers, respectively. Objective: To examine concomitant prescribing rates of statins and CYP450 3A4 inhibitors and inducers for older patients (≥65 years of age) in routine clinical practice Methods: From a large electronic medical record dataset (GE Medical System) in United States, patients ≥65 years of age who were newly initiated on statins (including fixed dose combination of simvastatin and ezetimibe (SMV/EZE) from August 1, 2004 until July 31, 2005 were included. Rates of concomitant prescribing of statins with CYP 450 3A4 inhibitors were calculated. Results: A total of 31,246 new statin users ≥65 years of age were identified. The percent of patients on atorvastatin (ATV), fluvastatin (FLV), lovastatin (LOV), pravastatin (PRV), rosuvastatin (RSV), simvastatin (SMV), and SMV/EZE were 50.1%, 1.0%, 7.8%, 7.1%, 6.4%, 22.4%, and 9%, respectively. The mean age was 73 years and 45% were male. During one-year observation period, the rates of concomitant prescription of a statin and any CYP 450 3A4 inhibitor and inducer were 25.9% (8,090 of 31,246) and 17.8% (5,549 of 31,246), respectively. With the CYP450 3A4 inhibitors or inducers of concomitant prescription of a statin and any CYP450 3A4 inhibitor and inducer were 25.9% and 17.8% (5,549 of 31,246), respectively. With the CYP450 3A4 inhibitors or inducers of concomitant prescription of a statin and any CYP450 3A4 inhibitor and inducer were 25.9% and 17.8% (5,549 of 31,246), respectively. With the CYP450 3A4 inhibitors or inducers of concomitant prescription of a statin and any CYP450 3A4 inhibitor and inducer were 25.9% and 17.8% (5,549 of 31,246), respectively. 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How Veterans Health Administration Facilities Have Changed practices to Improve Care for Patients With Acute Coronary Syndromes

Christian D Heitricht, Nancy D Sharp, Sandra L Pnneros, Elliott Lowy, Kelly A McDermott, VA Puget Sound Healthcare System, Seattle, WA; Anne E Sales, Univ of Alberta, Edmonton, Canada; Greg E Larsen, Portland Med Ctr, Portland, OR; Stephen D Flinn, VA Puget Sound Healthcare System, Seattle, WA

Background: Veterans Health Administration (VHA) is a leader in quality of care and beginning in 2003, has made improving emergency care for acute coronary syndrome (ACS) a priority. Because of their heterogeneity, each of 21 regional networks and their constituent 146 VHA facilities were required to create cardiac care plans. Objective: Describe how VHA facilities have responded to this initiative. Methods: We conducted semi-structured, hour-long interviews with 182 participants from 93 facilities and 14 regional networks and used this information to identify quality improvement (QI) practices in the delivery of care for ACS patients. Surveys were administered to Chiefs of Cardiology, or to Chiefs of Medicine where there was not a Cardiology service. Transcripts were coded by researcher daubs. A list of specific ACS QI practices were developed and used to create a web-based survey to collect data. Results: Surveys were returned by 105 of 146 VHA facilities (72% response rate). We identified a total of 28 ACS QI practices. These included pre-discharge education by the Cardiology Section; discharge education by the Cardiology Section. Conclusions: A web-based survey of these practices achieved a high response rate and provides a clearer picture of ACS care practices in VHA. We are currently assessing the association between QI practices and ACS performance indicators.

Non-Cardiac Comorbidities and Exercise Capacity Among Patients With Heart Failure

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Non-cardiac factors, such as diabetes mellitus (DM), arthritis, and depressive mood may influence exercise capacity in heart failure (HF) patients. Our objective was to evaluate the relationship of non-cardiac comorbidities with maximal exercise capacity (peak oxygen consumption [VO2]) and submaximal exercise capacity (6-minute walk test [6-MWT]) in high risk Veterans with HF. Methods: Sample characteristics (N=78) were: age 62.6±10.6 years, left ventricular ejection fraction (LVEF) 27±9%, 41 (53%) non-Caucasian, 62 (80%) NY Heart Association (NYHA) class II, 16 (20%) NYHA III/IV, 30 (39%) history of DM, 28 (36%) left ventricular ejection fraction (LVEF) was below 35%, 20 (26%) history of arthritis, and 38 (49%) depressed mood. Regression: peak VO2 accounted for 38% of the variance between peak VO2 (p<.005). New York Heart Association class (beta = -.21, p = .03). Results: 72.1% of the patients had at least one predisposing risk factor. There were no significant differences in the walking distance for the 6-MWT between patients with and without risk factors.

Non-Cardiac Comorbidity and Exercise Capacity Among Patients With Heart Failure

Eugene C Lin, Fuyun Liu, Angela DiSabatino, Smitha Beeravolu, Stephen Bomhoff, William Weintraub, Marc T Zubrow; VA Greater Los Angeles Health Care System, Los Angeles, CA; Greg R D'Orazio, UCLA, Los Angeles, CA; Kathleen Dracup, UCSF, Los Angeles, CA

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Asymptomatic Deep Vein Thrombosis Rates in Consecutive Patients Undergoing Screening Duplex Ultrasonography With Compression

Angela DSabatino, Smitha Beeravolu, Stephen Bomhoff, William Weintraub, Marc T Zubrow; Christiana Care Health Services, Newark, DE

Purpose: Determine the rate of asymptomatic deep vein thrombosis (DVT) in consecutive hospitalized patients who undergo duplex ultrasonography with compression (DUSC) prior to pneumatic compression boot (PCB) placement for prophylaxis. Methods: Prospective evaluation of 1867 consecutive patients who underwent DUSC to rule out DVT prior to PCB placement. DVT is defined as a clot in the venous system of the lower extremities anywhere below the inguinal ligament. Upper extremity DVT was excluded from data collection. Additionally, all patients who were positive for DVT were assessed for risk factors for DVT using the American College of Chest Physicians’ criteria (ACCPC Recommendation on Antithrombotic and Thrombolytic Therapy, Evidence-Based Guidelines). Results: From October 2005 to November 2006, 1867 consecutive patients underwent DUSC. One noted in the literature patients or 5.9% (112 of 1867) were found to be asymptomatic DVT. Of those patients with DVT, 95% (97 of 102) had at least one predisposing risk factor. Only 5 patients without any predisposing risk factors were found to have an asymptomatic DVT. Conclusion: Almost all patients with asymptomatic DVT have at least one predisposing risk factor. There may be no need to do DUSC prior to initiation of PCB’s if the patient has no predisposing risk factors for DVT. Further investigation is warranted to determine the percentage of patients with DVT risk factors who were screened for DVT but do not have a positive DVT result. Clinical implications of DUSC prior to placement of PCB’s. Substantial cost savings may be realized if patients are screened for predisposing risk factors for DVT prior to ordering DUSC. It is yet to be determined what the incidence for DVT is for those without risk factors.

Projecto Puentes de Salud: An Exploration of Cardiovascular Health and Risk Factors in Rural Mexico

Trista D Snyder, Allan D Narney, Ian J Nelligan, Amanda L Rollins, Bron Skinner, Pamela Y Frasier, Daniel Reuland, Flavio Rojas, Mauricio Cohen; Univ of North Carolina at Chapel Hill, Chapel Hill, NC

The 2000 NC census estimated a 1200% increase in Hispanic immigration to the Triangle area. A large proportion of the economic migrants come from rural Mexican communities, and little is known about their antecedent lifestyles and health risks and how these might contribute to their current risk status. Therefore, this study was initiated to assess cardiovascular risk factors of rural residents in Guanajuato, Mexico in order to provide physicians with an all-emcompassing view of Latino health. A convenience sample of 267 participants, recruited from six rural communities in Guanajuato during June and July of 2006, were (1) offered free screenings for cholesterol, fasting glucose, blood pressure, and obesity; (2) counseled about risk factors for cardiovascular diseases and diabetes; and (3) interviewed using a standardized questionnaire that included demographic information, past medical history, family history, dietary and lifestyle behaviors, and social and psychological health. Two hundred and sixty seven participants (ages 20–86) were screened and interviewed. There were 105 patients with a positive DUSC (>140/90) was 29.96%, impaired fasting glucose (>100 mg/dL) was 25.02%. Frequency of abnormal cholesterol and HDL was 19.5% (>200 mg/dL and 85.55% (>40 mg/dL, men, <50mg/dL, women), respectively). Abdominal obesity rates were 73.03%. We detected a high prevalence of cardiovascular risk factors in rural Mexicans that warrants further investigation. According to WHO guidelines, 23% were positive for The Metabolic Syndrome. Lacks of education on cardiovascular risk factors and healthy lifestyles seem to play a major role in perpetuating poor diet, limited exercise, and daily health choices. Improving the health of Mexicans in rural places of origin may have a ripple effect on the health of Latinos immigrants we treat in our community. Also, understanding of this expanding patient population will give American physicians a head-start when treating and educating in the clinic. The study was limited by the under-representation of men in the research and by being a convenience sample.

Process Improvement in Cardiac Rehabilitation Enrollment

Lisa Nellius, Timothy Parosky, Matthew Collins, Joan McKenna, Anthony B Furey DO, FACCC, William S Weintrub MD, FACCC, Christiana Care Health Systems, Newark, DE

Background: National referral rates for outpatient cardiac rehab average less than 35% for cardiac patients with conditions that fall within Medicare coverage guidelines. Since cardiac rehab has proven a very effective means of preventing recurrence and providing long term, heart-healthy behavior modifications, increasing participation is an important goal. The goal of making outpatient cardiac rehab a routine component of long term cardiac care proved elusive. This process improvement project evaluated the effectiveness of an automated process for referring patients to cardiac rehab as a mechanism to increase participation. Method: An integrated system was implemented to evaluate data on cardiac patient census, referral and enrollment beginning in 2004. Consensus was built around the need for a systematic referral procedure to be utilized in conjunction with daily inpatient and outpatient cardiac educational awareness efforts. This was achieved through a standardized cardiac physician order set. This form provided a list of pre-selected orders for outpatient cardiac rehab in selected cardiac conditions established by the Cardiology Section. Results: The number of patients participating in the program increased from 2003 to 2004, to 3809 to 3974 in 2007. Referral increased an average of 27%. Community-wide efforts were increased from 3479 for July thru Oct. 2005 to 5464 for July thru Oct. 2006. This is an increase of 36%. Conclusions: Automated order sets, combined with strong support from physicians, resulted in significantly increased referral and enrollment. Additional Medicare diagnoses coverage beginning in March 2006 also had a positive impact on overall outpatient volume, but this data provides positive evidence that this approach is effective in increasing patient participation in outpatient cardiac rehab.

Venous Thromboembolism (VTE) Treatment With Low-Molecular-Weight Heparin Reduces Total Hospital Costs and VTE-Related Readmission

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Objective: To compare direct medical costs (DMC) and venous thromboembolism (VTE)-related readmission rates associated with patient anticoagulation treatment for VTE. Methods: Retrospective analysis of discharge and billing records (Premier Inc. Perspective™ database) was performed on patients >18y with a primary diagnosis of VTE (2003–2005). Patients who had a VTE diagnosis during the 12m pre-index period or had a pre-existing contraindication to anticoagulant therapy were excluded. All costs occurring throughout the index hospitalization were tallied as total DMC. Readmission with a primary or secondary diagnosis of VTE >90d of discharge was considered VTE-related. Differences in log-transformed DMC were estimated using generalized linear models, adjusting for patient and hospital characteristics and excluding DMC outliers (top 1%). Differences in readmission rates were estimated using logistic
Conclusions: Despite higher drug-related costs with LMWH, VTE treatment with LMWH is associated with significantly lower DMC and non-drug-related component costs. Additionally, LMWH patients are less likely than UFH patients to be readmitted within 90 days. Although statistical methods are necessary to substantiate these findings, these data suggest that LMWH is potentially a dominant strategy for treating VTE.

High Rate of Cardiovascular Events in Patients With Severe Hypertension in a Community Practice Setting

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Background: This retrospective study of longitudinal electronic medical records examines the association between the severity of Hypertension (HTN) and subsequent CV disease related emergency room (ER) and hospital admissions. Methods: Hypertensive patients were identified from 11 urban and suburban primary care and women’s health practices. Patients age >18 years were included based on a problem list diagnosis of HTN at least 2 years of blood pressure (BP) measurements ≥140/90. HTN categories were defined as mild (BP ≥140/90), moderate (BP ≥160/100), and severe (BP ≥180/110). Each patient was assigned to the category associated with their maximum BP measurement. The date the patient first achieved this stage became their index for this study. CV hospitalizations and ER visits were then examined. Event rates were analyzed as Poisson counts by negative binomial regression.

Results: A total of 6607 patients with 1273 events occurring over 24,770 patient years were studied. The mean age was 55 years, 65% female, and 41% black. Nearly 1/3 of our HTN population qualified as severe. Severe hypertensives had significantly higher event rates. The following table presents observed and adjusted rates for age, gender, and race per 1,000 patient-years.

<table>
<thead>
<tr>
<th>Events</th>
<th>Rate</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
<th>Sig (p&lt;0.05)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Cardiovascular</td>
<td>Observed</td>
<td>61.04</td>
<td>76.77</td>
<td>142.76</td>
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<tr>
<td></td>
<td>Adjusted</td>
<td>66.15</td>
<td>82.41</td>
<td>151.25</td>
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<tr>
<td>AMI</td>
<td>Observed</td>
<td>3.19</td>
<td>4.84</td>
<td>9.30</td>
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</tr>
<tr>
<td></td>
<td>Adjusted</td>
<td>3.38</td>
<td>4.83</td>
<td>9.69</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Hypertensive Urgency</td>
<td>Observed</td>
<td>7.35</td>
<td>6.39</td>
<td>25.62</td>
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<tr>
<td></td>
<td>Adjusted</td>
<td>7.61</td>
<td>6.68</td>
<td>27.47</td>
<td>&lt;0.05</td>
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<tr>
<td>Heart failure</td>
<td>Observed</td>
<td>8.37</td>
<td>18.86</td>
<td>27.40</td>
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<tr>
<td></td>
<td>Adjusted</td>
<td>9.19</td>
<td>22.07</td>
<td>34.58</td>
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</tr>
<tr>
<td>Stroke</td>
<td>Observed</td>
<td>5.83</td>
<td>6.29</td>
<td>17.21</td>
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<tr>
<td></td>
<td>Adjusted</td>
<td>5.73</td>
<td>6.34</td>
<td>17.58</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>IHD (excluding AMI)</td>
<td>Observed</td>
<td>31.49</td>
<td>35.04</td>
<td>52.77</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adjusted</td>
<td>33.56</td>
<td>36.25</td>
<td>54.79</td>
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<td>CV mortality</td>
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<tr>
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<td>Adjusted</td>
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<td>9.23</td>
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</table>

1. Cardiovascular related hospitalizations and emergency room visits


Amrit P Amin, John H. Stroger, Jr. Hosp of Cook County, Chicago, IL; Sandeep Nathan, Amit P Amin, John H. Stroger, Jr. Hosp of Cook County, Chicago, IL; Russell F Kelly; John H. Stroger, Jr. Hosp of Cook County, Chicago, IL

Introduction: The epidemiology of premature CAD (PCAD) is poorly defined in the urban, low socioeconomic population. We previously identified cardiac risk factors (CRFs) predictive for PCAD in this population. We now explore the interaction between risk factors and race in PCAD.

Methods: Data from 416 pts ≥40 yrs of age undergoing coronary angiography at Cook County Hospital (1993–2001) for suspected PCAD were compiled prospectively and analyzed as an open, retrospective cohort. The primary outcome was angiographic CAD (≥50% stenosis in ≥1 coronary artery), adjudicated by blinded angiographic review. Risk of CAD by race and CRFs was estimated via stepwise logistic regression. We categorized subjects into four groups: Blacks, Hispanic, Whites, and Asian-Indians, with Black race the reference group. Results: Of 416 pts, 33% (136) had PCAD, and 67% had severe CAD (≥70% stenosis). PCAD risk was lower among Hispanic (20%) and Black (30%) pts and higher among White (50%) and Asian-Indian (50%) pts. Despite the difference in prevalence of disease, the distribution of number of important CRFs was the same across ethnic groups: median, 1 risk factor; interquartile range, 0 or 1 to 2 (Kruskal-Wallis test, P = 0.24). However, in the presence of dyslipidemia, Blacks and Hispanics had a statistically significant higher risk for PCAD than Whites or Asian-Indians (Fig 1). Conclusions: In the presence of dyslipidemia, young, urban Blacks and Hispanics have a higher risk of premature CAD. This may be targeted as the key risk factor for primary prevention in this low socioeconomic urban population. Further investigation of ethnic differences of dyslipidemia as a CAD risk factor is warranted.
Assessing Racial Differences in Low-Density Lipoprotein Levels in Coronary Stent Patients at a Veterans Administration Hospital
Shaun J Cardozo, Anupama Shivaraju, Jeffery Marogil, Shobh Sitafalwala, Adhir Shroff; Univ of Illinois-Chicago, Chicago, IL

Background: Adherence to evidence based guidelines is known to decrease adverse cardiovascular events. The NCEP ATPIII guidelines recommend a low density lipoprotein (LDL) level <100 mg/dL. Patients undergoing percutaneous coronary intervention (PCI) represent a particularly high risk cohort for adverse events. Studies indicate that minorities, in particular African Americans, are less likely to achieve optimal lipid profiles compared to Caucasians.

Methods: We performed a retrospective study of changes in lipid profiles and medication usage in consecutive patients who underwent PCI at an inner-city Veterans Administration (VA) institution between September 2004 to August 2005. The lipid panel and cholesterol medications were checked prior to and six months post PCI. Results: A total of 378 patients were included. The mean age of the patients was 66 years, M = 71.2 ± 4.93, (SD). At baseline, 80% of the patients had a history of cardiovascular disease (CVD) and 58% of them were on lipid lowering medications. Pre and post PCI results are shown in the table:

<table>
<thead>
<tr>
<th>Anti-Hypertensive Class</th>
<th>Pre-PCI (%)</th>
<th>6 Month Post-PCI (%)</th>
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<th>p-value</th>
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<td>Calcium Channel Blockers</td>
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<td>30</td>
<td>-2</td>
<td>NS</td>
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<td>Calcium Channel Blockers</td>
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<td>-5</td>
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<td>Non-Diabetics (n = 212)</td>
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<td>Beta-Blockers</td>
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<td>ACE-I/ARB</td>
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<td>76</td>
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<td>27</td>
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<td>0</td>
<td>NS</td>
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</tbody>
</table>

Adherence to the US Joint National Committee VII (JNC-7) Guidelines for Blood Pressure Control in a Veterans (VA) Health Institution Six Months Post Coronary Intervention
Anupama Shivaraju, Shaun J Cardozo, Jeffery Marogil, Adhir Shroff, Univ of Illinois at Chicago, Chicago, IL

Background: Blood pressure (BP) control in patients with known coronary artery disease reduces morbidity and mortality. The JNC-7 recommends a BP goal of <130/80 in patients with compelling indications such as coronary artery disease and diabetes. Beta-blockers (BB), angiotensin antagonists (ACE-I/ARB), diuretics and calcium channel blockers (CCB) are indicated in individuals with compelling indications. Prior studies have demonstrated racial disparities in blood pressure control. Methods: We conducted a retrospective cohort study investigating the attainment of JNC-7 targets for blood pressure in 378 patients who underwent a percutaneous coronary intervention (PCI) at a VA hospital from September 2004 to April 2006. We collected blood pressure and anti-hypertensive medication data at the time of the PCI and at the end of follow-up. We also analyzed the impact of race and diastolic status on BP.

Findings: Of the 378 patients, we included 362 (15 and 1 was lost to follow-up); our sample population included 192 African Americans (AA). During follow-up, the mean systolic blood pressure (SBP) decreased from 135 to 131 (p < 0.008), and the diastolic blood pressure (DBP) decreased from 74 to 72 (p = 0.01). However, there was no difference in BP among the diabetic patients. The proportion of patients reaching their SBP goal increased from 41% to 52% (p < 0.0007). At six months, there was an overall increased utilization of BB and ACE-I/ARB (Table). However, no difference was noted in ACE-I/ARB use among diabetic patients. When we analyzed the data by race, there was no significant difference in BP values or medication usage at both time periods. Conclusion: Although we observed an improvement in blood pressure, a large percentage of patients remain sub-optimally controlled, especially the diabetic patients. There were no racial disparities in BP control or medication use. We noted high levels of compliance with evidence based medical therapies in this high risk population.
The Influence of the Stroke-TPI on Decision Making to Administer or Not Administer Thrombolytics in Acute Stroke

Bethany R Smith, Tufts-New England Med Ctr, Boston, MA; Robert Silbergleit, William G Barsan, Univ of Michigan, Ann Arbor, MI; Robin Rothazer, David M Kent; Tufts-New England Med Ctr, Boston, MA

Background Under-use of rt-PA in ischemic stroke may be due to its perceived risks and benefits. The Stroke-Thrombolytic Predictive Instrument (TPI) was developed to provide patient-specific information regarding outcomes with and without rt-PA. It was derived on a pooled database of 2184 patients from the 5 major clinical trials of IV rt-PA. We sought to explore the influence the Stroke-TPI’s patient-specific predictions might have on physician’s decision to administer rt-PA. Methods A case-based experimental survey of emergency physicians who conducted venous catheter randomization trials and 11% were non-white. Fifty-three percent of the intervention group were married compared to 78% of the control group. GDS scores for the intervention group were T1 = 5.65 (SD = 3.42) and T2 = 7.60 (SD = 2.04)(p = 0.000). Participants in the control group (N = 9; 3 females and 6 males) had mean scores on the GDS for T1 = 3.31 (SD = 3.52) and T2 = 5.06 (SD = 2.96) (p = 0.49). KCCQ-QOL scores for the intervention group for T1 = 49.54 (SD = 27.34) and at T2 = 70.83 (SD = 19.85)(p = 0.00). Participants in the control group (N = 9; 3 females and 6 males) had mean scores for QOL at T1 = 77.78 (SD = 14.43) and T2 = 72.22 (SD = 22.05) (p = 0.45). Conclusion: The dosage of the 6-session education-support intervention mitigated symptoms of depression and improved quality of life.

Outcomes for Patients With ST-Elevation Myocardial Infarction (STEMI) Based on Time to Reperfusion Therapy at Veterans Health Administration (VHA) Facilities

Kelly A McDermott, Chuck Maynard, Elliott Lowy, Dep of Veterans Affairs, Seattle, WA; Anne E Salas, Univ of Alberta, Edmonton, Canada; Christian D Helfrich, Stephen D Finn, Dep of Veterans Affairs, Seattle, WA.

Objectives: We sought to assess the association of timely reperfusion therapy with in-hospital outcomes and 30-day mortality among veterans presenting with STEMI to VHA facilities. Methods: A national performance model only 10.6% of the patients achieved all three of the goals. Program range for 29 individuals (16 females and 13 males) are reported. Intervention participants had a mean age of 59.25 years (SD = 11.50), a mean of 13.20 years of education (SD = 2.78), and 35% were non-white. The control group had a mean age of 68.22 years (SD = 12.14), a mean of 14.64 years of education (SD = 3.08), and 11% were non-white. Thirty-three percent of the intervention group were married compared to 78% of the control group. The overall rate of administration of rt-PA was 62% (1862/2994), with no significant difference between control and the intervention (633/1500, p = 0.457; 74% (381/488) versus 71% (384/516), p = 0.006, respectively). However, for the low-benefit group, presence of the Stroke-TPI prognoses inhibited the use of thrombolytics (36% (177/486) versus 54% (275/512), p = 0.055 and 78% (381/488) versus 71% (384/516), p = 0.006, respectively). The results suggest that presentation of individualized prognostic information influences physician decision-making, even when all patients are eligible for thrombolytics. They also suggest that the Stroke-TPI may increase thrombolytic use on typical and high-benefit patients, but decrease use on others. Further study is needed to address the tendency to dissuade physicians from treating low-benefit patients.

Depression and Quality-of-Life Outcomes From an Education Support Intervention for People Living With Heart Failure

Angela P Clark, Graham McDougal, Carol Delville, Ashley Davilla, Glenda Joiner-Rogers, Sheryl Innerarity, Janis Carelock, Shannon Patton, Hsing-Mei Chen; Univ Texas at Austin, Austin, TX

Background: Depression is common in people living with heart failure and is associated with poorer clinical outcomes, including higher mortality and rehospitalization. Current evidence-based medical therapies focus on pharmacotherapeutics to reduce neurohormonal production and remodeling. The effects of tailored psychosocial interventions are less well known. Mechanical ventilation post randomization control trial testing the efficacy of a home, education-support intervention consisting of 8 sessions. Outcome measures included the Geriatric Depression Scale (GDS) and The Kansas City Cardiomyopathy Questionnaire subscale for quality of life (KCCQ-QOL). Inclusion criteria included males and females 45 years of age or older with a diagnosis of cardiac dysfunction from a hospital and community heart failure clinic. The attention control group received 9 visits and content about healthy aging. Advanced practice nurses delivered both the
Statistical Models and Patient-Level Predictors of Readmission for Heart Failure: A Systematic Review

Joseph S Ross, Mount Sinai Sch of Medicine, New York, NY; Gregory Mulvey, Brett Staufert, Susannah M Bernheim, Patricia S Keenan, PHD, Harlan M Krumholz; Yale Univ Sch of Medicine, New Haven, CT

Objective Heart failure readmission has been proposed as a quality indicator for heart failure (HF) management. We performed a systematic review of studies that examined statistical models to predict individual risk of readmission or evaluated patient-level predictors of readmission for HF patients. Methods We identified relevant studies by searching MEDLINE, Scopus, PsychINFO and all four Ovid EBMs Reviews. Eligible publications reported on readmission for hospitalized adult HF patients in the English language. We excluded experimental studies and publications without primary data or quantitative outcomes. Two independent investigators reviewed all titles and abstracts and selected studies for inclusion. We developed a standardized instrument to perform a detailed abstraction of these publications. Results We identified 646 publications; 63 met criteria for abstraction. Two (3%) studies derived models to predict individual risk of short-term outcomes. However, none of these studies examined patient-level predictors of readmission. Data from medical chart review, alone or in combination with administrative data, were used to develop the models. Neither validated their model against only medical record data, used national data nor controlled for the clustering of patients within hospitals. Sixty one (97%) studies examined patient-level predictors of hospital readmission. From a 100% sample of fee-for-service Medicare patients discharged between 2000 and 2004 with a primary heart failure diagnosis. We compared OPTIMIZE-HF patients with non-OPTIMIZE-HF patients on the basis of demographics and comorbid conditions using validated algorithms. We modeled time to readmission and time to death as functions of patient and hospital characteristics with adjustment for patient clustering within hospitals. There were 23,328 fee-for-service Medicare patients in the OPTIMIZE-HF registry. Compared to 889,226 non-OPTIMIZE-HF fee-for-service Medicare patients, patients in the OPTIMIZE-HF registry were more likely to be non-white (27.7% [6,462 of 23,328] vs. 21.2% [188,516 of 889,226]), and COPD (46.3% [10,801 of 23,328] vs. 88.8% [789,633 of 889,226]). OPTIMIZE-HF patients were more likely to have had a prior MI (23.0% [5,832 of 23,328] vs. 19.4% [172,310 of 889,226]), renal failure (27.7% [6,462 of 23,328] vs. 21.2% [188,516 of 889,226]), and COPD (46.3% [10,801 of 23,328] vs. 41.8% [371,696 of 889,226] (p < 0.001 for all comparisons). Controlling for patient and hospital covariates, there were no significant differences in survival (p = 0.6430) or all-cause hospitalization (p = 0.6430) between the two populations. The analysis above for non-OPTIMIZE-HF patients entered into the OPTIMIZE-HF registry are similar in baseline characteristics and outcomes to fee-for-service Medicare patients in the nation as a whole.

208 A Multifaceted Intervention to Improve Stroke Care

Judith A Hinchen, Tufts-New England Med Cntr, Boston, MA; Timothy J Shephard, Stroke Systems Consulting, Charlottesville, VA; Sarah Tom, American Academy of Neurology, Minneapolis, MN; Harry P Selker, David M Kent; Tufts-New England Med Cntr, Boston, MA

Objective To determine if a multifaceted intervention is better than data feedback and benchmarks (BF) alone to improve adherence to 4 in-hospital stroke quality indicators (QI); door to needle time of tPA (tPA), score for tPA over 60 minutes (tPA60), prophylaxis for DVT, and warfarin for atrial fibrillation (WAR). Methods: Hospitals were paired on baseline adherence to DYS and QI, and randomized to receive BF (n = 7) versus BF and SF to specific barriers to improvement (n = 6). Data were collected concurrently on all acute ischemic stroke patients admitted to the hospital and seen by neurologists before and after a 6 month implementation period. The 1st outcome was the difference in post intervention adherence rates for each QI; a secondary outcome was change in adherence rates from baseline. The study was not powered to detect a difference in the IPA QI. Results: Data were collected on 2074 pre-intervention, and 1240 patients post-intervention. Some intervention sites were not able to adopt some of the targeted interventions during the implementation period. Standing orders for DVT were adopted at 2/6 intervention sites (with delayed adoption at 3/6) versus 2/7 control sites, while dysphagia screens were adopted at 3/6 intervention sites, (with delayed adoption at 2/6) versus adoption at 2/7 control sites. The intervention group had a higher post intervention adherence rate for WAR compared to the control group, 98% v 87%, p < .0005. No other QIs had a significant difference in post intervention adherence. There was a non-significant trend for more improvement in the intervention group versus the control group for both DVT (change of 8% v 5%) and IPA (3% v -2%) while for DYS there was a significant trend for more improvement among the controls (14% v 8%). Conclusion: Identification of site-specific barriers with targeted recommendations for improvement led to improved adherence on the WAR QI compared with BF alone, but not the other QIs. The long delay in implementation of dysphagia screens and standing orders may explain the lack of statistically significant improvement on the DYS and DVT measures. Larger studies with longer intervention phases are required to determine if targeted interventions are necessary for stroke improvement.

209 The Link Between Heart Failure Hospital Performance Measures and Long-Term Outcomes: Findings From OPTIMIZE-HF

Adrian F Hernandez, Mark E Patterson, Bradley G Hammill, Duke Univ Med Cntr, Durham, NC; Gregg C Fonarow, UCLA Med Cntr, Los Angeles, CA; Kevin A Schuman, Lesley H Curtis; Duke Univ Med Cntr, Durham, NC

The importance of the link between process and outcomes for measuring quality of care is controversial and evidence shows performance measures are only weakly associated with short-term outcomes. However, little is known about the link between current performance measures and long-term outcomes. Using data from the OPTIMIZE-HF registry, we constructed separate hospital-level scores for each of the CMS heart failure performance measures. These scores reflected the proportion of eligible patients who received (a) discharge instructions, (b) LVEF assessment, (c) ACE inhibitors at discharge, and (d) smoking cessation counseling. We also evaluated the CMS hospital-level composite measure (opportunities performed divided by eligible opportunities) and a hospital-level defect-free (proportion of all-or-none measure). We merged 1-year mortality data from Medicare with patient data from OPTIMIZE-HF. To estimate associations between hospital-level scores and mortality, we used multivariate Cox models with adjustment for patient covariates and clustering within hospitals. The 22,826 patients in the combined data set were followed for one year post-discharge (median follow-up 233 days); 7,193 (31.5%) died. The multivariable results suggest that a 10% point increase in the hospital-level proportion of patients who received each of the measures was associated with a 4% improvement in survival (HR 0.96, 95% CI 0.91—0.99). There was no significant relationship between other individual measures or the summary measures and survival. CMS indicators of hospital level quality of care for hospitalized patients with heart failure have little association with long-term outcomes. Further research is needed to develop better methods for measuring and improving the quality of heart failure care.
Use of Antiarrhythmic Drugs and Beta-Blockers in Patients With an Implantable Cardioverter Defibrillator

Nancy M Allen LaPointe, Duke Univ Med Ctr, Durham, NC; Judith A Stafford, Kevin J Atkinson; Duke Clinical Rsch Institute, Durham, NC; Robert Piana, Vanderbilt Univ, Nashville, TN; Adhir Shroff; Univ of Illinois-Chicago, Chicago, IL

Objective: As the first step in investigating clinical outcomes associated with antiarrhythmic drugs (AAD) and beta-blockers (BB) among ICD and CRT-D recipients in clinical practice, we explored the patient characteristics of ICD/CRT-D recipients and use of AAD and BB at time of implant and for 2 years after implant. Methods: Patients ≥18 years with a new ICD or CRT-D implant (ICD-9 codes 37.94 and 00.51) at Duke Hospital between 7/99 to 7/04 were identified using health system data. To obtain baseline patient characteristics, inpatient AAD and BB use during 2 years following implant, a subset of patients with a cardiac procedure 6 months prior or 30 days after ICD/CRT-D implant who participated in the Duke Database for Cardiovascular Disease clinical follow-up were selected. Results: A total of 810 patients (619 ICD, 191 CRT-D) were identified, but only 447 (55%) had the needed inpatient and clinical follow-up data. In this subset, median age was 65 (IQR 55.73) and 77% were males. A history of ventricular arrhythmias was found in 83% (86% ICD, 69% CRT-D), 9% had a previous cardiac arrest (9% ICD, 7% CRT-D), and 37% (45% ICD, 43% CRT-D) a history of atrial fibrillation. CRT-D recipients were more likely to have a history of heart failure (03% vs. 52%, p < 0.001) and renal insufficiency (20% vs. 6%, p < 0.001) than ICD recipients. BB and AAD drug use at baseline and during follow-up is presented in the Table. At baseline, about 79% were taking a BB and 34% were taking an AAD. In follow-up, the proportions were lower, 76% with BB and 30% with AAD. Conclusion: Despite evidence for BB in primary and secondary prevention of sudden cardiac death, BB use in our ICD/CRT-D population appeared less than optimal. Further analyses are needed to identify barriers for BB adherence and explore associations between both BB and AAD use with clinical outcomes.

Baseline and Follow-up Medication Use

<table>
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<th>Baseline</th>
<th>Follow-up</th>
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<tr>
<td>ICD (n=360)</td>
<td>CRT-D (n=67)</td>
</tr>
<tr>
<td>BB only</td>
<td>54%</td>
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<tr>
<td>AAD only</td>
<td>11%</td>
</tr>
<tr>
<td>BB and AAD</td>
<td>34%</td>
</tr>
<tr>
<td>Neither</td>
<td>12%</td>
</tr>
</tbody>
</table>

Is There a Synergistic Effect Between Hospital Volume and Physician Volume on Avoiding Adverse Outcomes of Percutaneous Coronary Interventions? An Analysis of the 2004 Florida Inpatient Discharge Data

Shital Kabmale, Yuhua Bao, James Studdnick; Univ of North Carolina at Charlotte, Charlotte, NC

Objective: To examine possible synergistic effect of hospital- and physician-volume on in-hospital mortality and post-operative complications such as CABG and hemorrhage/ hematoma for a percutaneous coronary intervention (PCI). Design and Method: In this retrospective cross-sectional study, we define high- (vs. low-) volume hospitals as hospitals with ≥400 procedures/year, high- (vs. low-) volume physician as physicians with ≥75 procedures/year.

210 Participation Bias and the Outcome of Myocardial Infarction: Establishing a Specimen Repository in the Community

Adelaide M Arruda-Olson, Susan A Weston, Brooke L Fridley, Jill M Killian, Veronique L Roger; Mayo Clinic, Rochester, MN

Background: Participation bias is a concern in epidemiologic studies requiring biologic specimen collection. The impact on genetic studies is not fully known. Methods: Within a geographically-defined myocardial infarction (MI) cohort, we examined the influence of participation on the consistency of a specimen repository and its association with outcome. During hospitalization for MI, we sought consent to use blood samples for genetic studies. Subjects initially refusing were later contacted by mail for use of blood or stored tissue samples. Stored tissue was collected when available from deceased subjects. Results: Among 3,601 eligible patients, 1,984 participated (55%), mean age 68 ± 14 and 1087 did not (54%; mean age 68 ± 15); 68% specimens were blood and 32% tissue. Participants were more likely to be younger men and to have hypertension, comorbidities and non-ST-elevation MI (all p < 0.05). Those providing blood specimens were more likely to have non-acute MI and lower Killip class than those providing tissue. After adjustment for age, sex, hypertension, ST-elevation, Killip class and Charlson index, participation overall was not associated with heart failure or death. However, subjects providing blood specimen were less likely to have heart failure (HR 0.49, 95% CI 0.40, 0.59, p < 0.01) or death (HR 0.16, 95% CI 0.12, 0.21, p < 0.01) compared to those providing tissue. Conclusions: In this cohort, MI specimens can be assembled from different sources. Participants differ from non-participants, and among participants, characteristics differ by specimen source. While participants providing blood specimens had better outcomes, there was no survival advantage for participants after combining all specimens. This underscores the importance of analyzing clinical characteristics and survival according to participation and specimen source.

213 Are We Measuring the Goals? Gender Differences in Evidence-Based Medical Therapies Among Patients Presenting With an Acute Coronary Syndrome (ACS) Who Undergo Post-Percutaneous Coronary Intervention (PCI): Results From the ACC-NCDR Cath/PCI Registry

Nausheen Akhter, Univ of Illinois-Chicago, Chicago, IL; Sarah Milford-Beland, Matthew T Roe, Duke Clinical Research Institute, Durham, NC; Robert Piana, Vanderbilt Univ, Nashville, TN; Adhir Shroff, Univ of Illinois-Chicago, Chicago, IL

Background: In prior studies, it has been documented that accepted medical therapies are used less frequently in women who present with ACS. Aspirin, β-blockers, and heparin are among the class I indicated medical therapies for ACS. We sought to explore if gender disparities in medical therapies exist in a large national PCI registry. Methods: We analyzed all patients who had percutaneous coronary intervention in the ACC-NCDR Cath/PCI registry from January 1, 2004 to March 30, 2006. Women were compared to men. The odds ratios were calculated by multivariable logistic regression adjusting for confounding baseline patient characteristics Results: Of the total 199,690 patients presented with ACS: 55,591 (28%) women presented with UA/STEMI and 12,335 (6%) women presented with STEMI. In the acute setting, women were less likely than men to receive aspirin, unfractionated heparin, any glycoprotein IIb/IIIa (GpIIb/IIIa) inhibitor, or a statin (a Table). Conversely, women received β-blockers, direct thrombin inhibitors and low molecular weight heparin more commonly. At discharge, women received aspirin, clopidogrel and statins at lower rates than men (Table). Among all the ACS population, women were more likely than men to have an adjusted bleeding (OR 2.1) or vascular event (OR 1.4). Conclusions: Although multiple medical therapies were utilized at statistically lower rates for women compared to men, these differences were generally only ~1% in absolute terms. The largest clinically significant differences appear in the acute administration of any GpIIb/IIIa inhibitor and aspirin at time of discharge. This may be due to increased rates of adverse bleeding events and vascular complications among women. In this large national PCI registry, the overall compliance to evidence based medical therapies was high for women of acceptable risk for PCI suggesting no systemic under use of appropriate therapies in this population.

N = 199,690

<table>
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<tr>
<td>68</td>
<td>61</td>
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<tr>
<td>Prior revascularization (%)</td>
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<td>CHF on presentation (%)</td>
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<td>Compliance rate for women (%)</td>
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<td>Adjusted OR (Women compared to men)</td>
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</tbody>
</table>

214 Use of Antiarrhythmic Drugs and Beta-Blockers in Patients With an Implantable Cardiac Defibrillator

Nancy M Allen LaPointe, Duke Univ Med Ctr, Durham, NC; Judith A Stafford, Kevin J Atkinson; Duke Clinical Rsch Institute, Durham, NC; Robert Piana, Vanderbilt Univ, Nashville, TN; Adhir Shroff; Univ of Illinois-Chicago, Chicago, IL

Objective: As the first step in investigating clinical outcomes associated with antiarrhythmic drugs (AAD) and beta-blockers (BB) among ICD and CRT-D recipients in clinical practice, we explored the patient characteristics of ICD/CRT-D recipients and use of AAD and BB at time of implant and for 2 years after implant. Methods: Patients ≥18 years with a new ICD or CRT-D implant (ICD-9 codes 37.94 and 00.51) at Duke Hospital between 7/99 to 7/04 were identified using health system data extracted from the Duke billing system. To obtain baseline patient characteristics, inpatient AAD and BB use, and AAD and BB use during 2 years following implant, a subset of patients with a cardiac procedure 6 months prior or 30 days after ICD/CRT-D implant who participated in the Duke Database for Cardiovascular Disease clinical follow-up were selected. Results: A total of 810 patients (619 ICD, 191 CRT-D) were identified, but only 447 (55%) had the needed inpatient and clinical follow-up data. In this subset, median age was 65 (IQR 55.73) and 77% were males. A history of ventricular arrhythmias was found in 83% (86% ICD, 69% CRT-D), 9% had a previous cardiac arrest (9% ICD, 7% CRT-D), and 37% (45% ICD, 43% CRT-D) a history of atrial fibrillation. CRT-D recipients were more likely to have a history of heart failure (03% vs. 52%, p < 0.001) and renal insufficiency (20% vs. 6%, p < 0.001) than ICD recipients. BB and AAD drug use at baseline and during follow-up is presented in the Table. At baseline, about 79% were taking a BB and 34% were taking an AAD. In follow-up, the proportions were lower, 76% with BB and 30% with AAD. Conclusion: Despite evidence for BB in primary and secondary prevention of sudden cardiac death, BB use in our ICD/CRT-D population appeared less than optimal. Further analyses are needed to identify barriers for BB adherence and explore associations between both BB and AAD use with clinical outcomes.
Improving Care in Rural Community Health Clinics Using an Electronic Patient Cardiovascular Registry

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Background: Cardiovascular disease is the leading preventable cause of death in West Virginia (West Virginia Department of Health and Human Resources). West Virginia is second in the nation for cardiovascular disease deaths; this is a problem that needs to be addressed. West Virginia University’s Office of Health Services Research (OHSR) is working to improve the quality of cardiovascular disease care by assisting primary care sites with utilizing electronic patient registries, specifically the Chronic Disease Electronic Management System (CDEMS). Over 3000 patients from 25 health centers throughout WV are currently utilizing an electronic patient registry. This is one approach for improving care in medically underserved areas. Methods: Six clinics (N = 689) were selected for evaluation because their registries included patients with cardiovascular disease (coronary artery disease, chronic heart failure, hypertension, etc.) who had received care for one year pre and one year post CDEMS implementation with implementation completed August 2004 to September 2005. Health outcomes, including blood pressure and lipid control (e.g., cholesterol, HDL, LDL values) and services (e.g., nutrition education) were entered as baseline data for each patient and were tracked for the following year at each office and laboratory visit. Results: Comparisons between baseline and follow-up data showed improvements in a number of areas. Blood pressure means were significantly different from pre to post; diastolic decreased from 77.36 mmHg to 75.17 mmHg while systolic decreased from 133.54 mmHg to 131.31 mmHg. All lipid values (cholesterol, HDL, LDL, and triglycerides) improved significantly (p < 0.05). There also was a significant increase in patients completing a smoking assessment (1% (7 of 689) to 17% (119 of 689)), having a dental exam (3% (22 of 689) to 6% (45 of 689)), exercising three times or more per week (0.5% (4 of 689) to 28% (194 of 689)), setting a self management goal (21% (146 of 689) to 28% (194 of 689)), and exercising three times or more per week (0.5% (4 of 689) to 6% (45 of 689)). Conclusion: Our analysis provided little support for the synergistic effect of physician/hospital-volume on PCI outcomes. Further research is needed to further evaluate the clinical relevance of the volume cut-point in the current ACC/AHA guidelines.

The Impact of Interactive Voice Recognition Technology on Adherence to Statin Therapy

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Objective: To evaluate the ability of interactive voice recognition (IVR) technology to improve statin adherence in a cohort of new start patients. Methods: The study followed a prospective, randomized, controlled design. Plan members were identified based on the existence of a filled prescription for statin therapy between 5/1/2005 and 12/31/2005 and compared to a control group of members receiving usual care during that same time period. Statin prescription claims were evaluated through 6/25/2006 when study analysis was completed. Subjects were 18 years of age or older, continuously enrolled in the health plan for 2 years, and new users of statin therapy (no statin prescription for past 12 months). Members enrolled in any other plan-sponsored IVR initiative were excluded from this analysis. The intervention group received three automated phone calls; call one provided disease state education, call two was a refill reminder, and call three addressed the importance of physician follow up. The program provided customized interaction based on patient response, primary vs. secondary CVD prevention, and refill behavior. Persistence and mean possession ratios (MPR) were calculated at 6 months for all study participants and compared to usual care. Statistical significance was determined with Wilcoxon rank sum test for MPR and Chi-squared test for persistence. Results: A total of 6833 members were randomized to the test group and 4172 members to the usual care group. Demographics of study participants were similar in the two groups; overall 53% (3583/6833) were male with an average age of 56.8 years. Members in the test group demonstrated significantly higher rates of adherence compared to the control group (see table 1). These differences were seen regardless of age or gender. Conclusions: IVR technology can improve adherence to statins in new start patients. Additional studies are needed to evaluate the use of IVR technology in combination with other compliance methods.

Table 1. Impact of IVR Intervention on Statin Adherence at 6 Months

<table>
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<th>MPR (ideal)</th>
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<td>0.759 (0.30)</td>
<td>49.3%</td>
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<td>0.759 (0.30)</td>
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Reproducibility of Appropriateness Ratings in Cardiovascular Imaging

Manesh R Patel, Eric D Peterson, Duke Univ, Durham, NC; Robert C Hendel, Midwest Heart Specialists, Fox River Grove, IL; Michael J Wolk, Weill Med College of Cornell Univ, New York, NY; Karen C Caruth, Joseph M Allen, American College of Cardiology, Washington DC, DC; Pamela S Douglas, Duke Univ, Durham, NC; Ralph G Brindis; Univ of California San Francisco, San Francisco, CA

Background: The American College of Cardiology (ACC) has led recent efforts to create national appropriateness criteria to guide use of cardiovascular imaging modalities. These appropriateness ratings are developed by a modified expert consensus process (RAND Delphi method). The reproducibility of these panel ratings, however, is unknown. Methods: We prospectively evaluated the reproducibility of panel ratings during the initial development of procedures/year, according to the ACC/AHA guidelines. We conduct a logistic regression with hospital random-effects to assess the interaction-effect of physician- and hospital-volume on the likelihood of having in-hospital mortality and other adverse outcomes. Exclusion: Admissions with “new born” as the admit-type, hospitals with <5 procedures/year and physicians with only 1 procedure/year to limit the effect of potential coding errors. Study Population: insured patients aged 20 to 25 years in Florida with a primary procedure of PCI. The analysis sample consists of 60,561 discharges with PCIs performed by 716 physicians at 77 hospitals. Results: The rate of in-hospital mortality, CAGB and hemorrage/hemotama were 0.67% (408 of 60,561), 0.25% (149 of 60,561), 2.70% (1,638 of 60,561), respectively. Results of our adjusted analysis indicate that odds ratios (ORs) associated with high (vs. low) hospital and physician volumes were not significantly different from 1 in almost all three outcomes considered except for hemorrage/hemotama where high physician volume was associated with an OR of 0.52 (95% CI: 0.34 - 0.80). The results further indicated that the effect of high physician volume in high-volume hospitals was not statistically different from the same effect in low-volume hospitals, with ORs associated with the interaction terms being 0.89 (95% CI: 0.33 - 2.41) for in-hospital mortality, 0.76 (95% CI: 0.19 - 3.06) for CAGB and 1.45 (95% CI: 0.83 - 2.27) for hemorrage/hemotama. Conclusion: Our analysis provided little support for the synergistic effect of physician/hospital-volume on PCI outcomes. Further research is needed to further evaluate the clinical relevance of the volume cut-point in the current ACC/AHA guidelines.

Black and White Racial Differences in Mortality Following Acute Myocardial Infarction: A Systematic Review

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Objectives: To systematically review the medical literature comparing all-cause mortality rates post-acute myocardial infarction (AMI) in black versus white patients. Methods: We identified articles through a Medline search using the MedSH terms African continental ancestry group and myocardial infarction and a subsequent search of all references and citations of included articles. Included articles were published in English, included a statistical comparison of all-cause mortality after AMI between black and white patients as a study objective, and were not limited to post-procedure populations. The Medline search and data abstraction was done independently by two investigators with disagreements settled by consensus. Findings: Our initial search identified 306 potential articles, 32 were met criteria for our review. Most articles were based on multicenter observational studies (16) or national databases (14); 4 used data from a single hospital and 4 from clinical trials. Half of the articles (16) presented results for multiple models, examining the relationship between race and mortality for subgroups by age, sex or follow-up period resulting in 62 distinct mortality models. One quarter of the models presented (13) looked only at in-hospital mortality while others ranged from 30 day to 3 year follow-up periods. Over half (56 %) of the unadjusted models found no statistical difference in mortality between black and white patients. Of the remaining models 15% found higher all-cause mortality for black patients, 29% for white patients. Multivariable models varied greatly in which covariates were included, but most (81%) also found no statistical difference in all-cause mortality rates (9 % found higher mortality for blacks, 30% higher for whites). In contrast, 73% of adjusted models limited to patients 65 and older found higher mortality for white patients. Conclusions: The studies examining black/white differences in all-cause mortality are heterogeneous, largely drawn from large national samples, yet predominate by studies which find no statistical difference in mortality. Studies of older patients more commonly found a lower mortality rate for black AMI patients compared with white patients.

Reproducibility of Appropriateness Ratings in Cardiovascular Imaging
appropriateness criteria for trans-thoracic (TTE) and stress echocardiography (echo). Two 15 multi-specialty physician panelists, nominated by several medical societies and insurers, were separately convened to rate echo appropriateness under various clinical scenarios. Panel members, unaware of the study purpose, reviewed relevant literature and individually ranked clinical indications as inappropriate (score 1–3), uncertain (score 4–6), or appropriate (score 7–9). Then, after a ‘face to face’ meeting of the separate panels where the ratings were discussed, members made final individual ratings. Final scores for each indication were then determined by calculating the median score for each panel separately. The reproducibility between panel ratings was measured by overall classification agreement and by kappa statistic. Results: Echo appropriateness ratings varied widely across 19 indications: 9 (42%) inappropriate, 2 (11%) uncertain and 9 (47%) appropriate (Table). There was a 100% between panel agreement in appropriateness category for each of the 19 indications. The actual numeric rating for each indication also was highly concordant for the 19 indications, kappa = 0.976.

Conclusion: This pilot evaluation supports the reproducibility of appropriateness ratings of cardiovascular imaging developed via a consensus process among multi-specialty physicians.

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**WITHDRAWN**

**Texas Heart Institute Risk Scoring Technique (THIRST)**

MacArthur A Elayda, James Livesay, Vei-Vei Lee, James Michael Wilson; Texas Heart Institute, Houston, TX

**Objective:** To develop a simplified risk scoring model to predict hospital mortality for patients (pts) undergoing coronary artery bypass (CABG). **Methods:** This model was developed using the data from patients who had CABG at the Texas Heart Institute from 1993 to 2005. The database was divided into derivation (DS) and validation (VS) subsets. Using a stepwise multivariate logistic regression analysis, the predictors of hospital mortality (HM) were identified in the DS. An additive risk-prediction score (ARPS) of predicted mortality was developed. The final model using risk scores for the identified risk factor were validated in an independent data set of pts who were in the VS. Results: The DS had 10,866 pts who were operated from 1993 to 1999. The model had a very good discrimination area under the ROC curve of 0.82. The VS had 7,248 pts, operated from 2000 to 2005 with an area under the ROC curve of 0.79. An ARS was developed by multiplying the coefficients of logistic regression model by 10 and rounding it to the closest whole integer. Using ARPS, three risk groups were identified: low risk (THIRST score of 0–2), medium risk (THIRST score of 2–5), and high risk (THIRST score of ≥5). The identified independent predictors of HM were: female, age over 60, acute MI, prior revascularization, associated valve disease, peripheral vascular disease, diabetes, cerebrovascular disease, chronic lung disease, renal insufficiency, surgery, procoagulable IABP, concurrent procedures such as aortic valve surgery, mitral valve surgery, left ventricular aneurysm surgery, aortic aneurysm surgery and vascular surgery. HM for the low risk group (n=5,006) was 1.2%, expected mortality was 1.8%. For the medium risk group (n=3,156) was 4.8%, expected mortality was 4.7% and for the high risk group (n=2,704) was 17.8%, expected was 17.8%. The overall HM was 6.6%. **Conclusion:** THIRST is a simplified risk-scoring model that was developed using a large and accurate database from one of the leading cardiovascular centers in the country. This model is based on prospective clinical criteria, it can be used to predict HM prior to CABG which can enhance decision making and discussions with pts and their families. This is a user friendly risk-scoring tool that can be used at the patient’s bedside.

**Is Quality of Care for Unstable Angina Comparable to that for Acute Myocardial Infarction in the Veterans Health Administration?**

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**Background:** Improvement of care for ACS patients with either unstable angina (UA) or acute myocardial infarction (AMI) is a health care priority for VHA. Most recent studies have focused on AMI. Thus we evaluated whether VHA quality of care for ACS patients was comparable to that for AMI patients. **Methods:** Prospective observational cohort study. Diagnosis of ACS was made by the patients’ in-hospital physicians based on all available clinical data. On-site research coordinators consented and enrolled eligible patients. Detailed demographic, clinical, health status and treatment data were then collected on site. Results: Of the 736 patients, discharge diagnosis was UA in 294 (44%) and AMI in 412. Age (65±10 yrs), gender (98% male) and race (81% white) were similar in both groups. Compared with AMI patients, UA patients had higher rates of prior coronary intervention (PCI) (42% vs 28%), coronary artery bypass surgery (CABG) (31% vs 23%), hyperlipidemia (63% vs 76%) and obesity (50% vs 41%) (all p<0.05). However UA patients presented with less chronic kidney disease (11% vs 19%; P<0.05), hypertension (3% vs 7%; P<0.05) and Killip class ≥ III (14% vs 20%; P<0.05). While in hospital UA patients had more frequent angina (P<0.001), more use of nitrates (P<0.001) and less use of GP IIb/IIIa inhibitors and heparin (p<0.001). Evidence-based medications prescribed at discharge were similar in both groups: antiplatelet agents (92%), beta-blockers (90%), ACEI or angiotensin receptor blockers (73%), and statins (88%). UA patients underwent more inpatient cardiac catherizations (82% versus 68%, P<0.001) and in-hospital stress tests (17% vs 8%; P<0.01) than did AMI patients but did not more PCI’s (37% UA vs 32% AMI) or CABGs (18% vs 15%). In-hospital mortality rates were slightly but non-significantly higher in the AMI group (6.3% vs 3.4% in UA pts, P=0.072). **Conclusions:** UA patients received guideline-comorbidity and clinical data. Only adjusted results are reported. Results: The CR participation rate was only 20% at 1 month post-MI. At 1 year, compared to non-participants, CR participants had 2–3 times the odds of quitting smoking and following exercise instructions, whereas there was no improvement in compliance to dietary recommendations (Figure). In addition, CR patients had a 13% lower rates of rehospitalization or mortality. **Conclusions:** Despite existing practice guidelines for CR after MI, only 1 in 5 MI patients reported participation in CR at 1 month. Since CR was associated with beneficial changes in health behaviors and better outcomes, more aggressive efforts to increase CR participation after MI are needed.

**Association Between Cardiac Rehabilitation and Healthy Lifestyle After Acute Myocardial Infarction**

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**Background:** Cardiac rehabilitation (CR) is a Class I indication after myocardial infarction (MI) but CR benefits have been demonstrated in the 1980’s and 90’s, prior to the widespread use of percutaneous coronary intervention, ACE inhibitors and statins. Limited information is available in a contemporary and heterogeneous patient population on whether CR is associated with changes in beneficial health behaviors and outcomes after MI. **Methods:** A total of 2,438 MI patients were enrolled from 19 US sites in the PREMIER registry, 2,096 (84%) of which 1-month follow-up interviews. CR participation was assessed 1 month after MI. Outcomes at 1 year were patients’ reported adherence to instructions regarding smoking cessation, exercise, and diet; and a combined endpoint of mortality or rehospitalization. Logistic and proportional hazards regression models were used to adjust for sociodemographic, family medical history, and early post MI behaviors. Results: CR participation at 6-month was 42%. At 1 year, compared to non-participants, CR participants had 2.6 (1.1–5.5) times the odds of quitting smoking and following exercise instructions, whereas there was no improvement in compliance to dietary recommendations (Figure). In addition, CR patients had a 13% lower rates of rehospitalization or mortality. **Conclusions:** Despite existing practice guidelines for CR after MI, only 1 in 5 MI patients reported participation in CR at 1 month. Since CR was associated with beneficial changes in health behaviors and better outcomes, more aggressive efforts to increase CR participation after MI are needed.
recommended medications and procedures at rates as high or higher than those with AMI, suggesting UA and AMI patients received similar quality of inpatient care in VHA. In-hospital mortality rates were also similar.

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**Relationship of National Heart Failure Quality Composite Measures to Clinical Outcomes**

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Background Inpatient heart failure performance measures (HFPM) have been developed with the intent of public reporting and use in pay for performance programs. It is unknown whether application of the HFPM in an “all-or-none” fashion affects clinical outcomes. We sought to determine whether compliance with all four of the HFPM is associated with reduced mortality or all-cause readmission over 6 months. Methods: In a case-control study of 400 patients admitted to Christ Hospital, Cincinnati for the primary diagnosis of heart failure, demographic and clinical data as well as application of HFPM were assessed through chart review. For 6 months after discharge, deaths and all-cause readmissions were recorded. Outcomes data were also adjusted for baseline differences in co-morbidities, medications, and demographics in a multivariable model. Results: One hundred ninety-four patients whose care met all four of the heart HFPM (HFPM+) were compared to 206 patients from a similar time period who met 3 or less of the four measures (HFPM-). Overall, mean age was 70 years old, 49% male, mean ejection fraction 38%. There were 349 total all-cause readmissions in the HFPM+ group compared with 459 in HFPM-, p=0.03. Adjusted time to first all-cause hospitalization was longer for HFPM+ compared with HFPM- (HR 0.74, 95% CI 0.57–0.97, p=0.03), while there was no difference in time to death (HR 0.86, 95% CI 0.68–1.11, p=0.24). Kaplan Meier analysis of time to all-cause readmission (panel A) and death (panel B) are shown in the figure. Conclusion: Adherence to all four heart HFPM appears to reduce all-cause readmissions and time to first all-cause readmission, without a discernible effect on mortality.

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**Compliance With 2005 Emergency Medical Services Stroke Systems Recommendations: A Virginia Statewide Perspective**

Sabina A Brathwistle, Nina J Solenski; Univ of Virginia Health System, Charlottesville, VA

Purpose: The American Stroke Association (ASA, 2005) has strongly advocated the development of statewide stroke systems with specific recommendations, including those for the emergency medical services (EMS) management of stroke patients. The objective of this study was to describe the current state of EMS stroke care in Virginia (Va), and to determine compliance with the 5 specific ASA recommendations. Methods: A 2 year, statewide, retrospective review of Va Department of Health EMS Prehospital Patient Care Records (PPCR) data filed on 911 transport EMS scene calls in Va Federal Information Processing Standards (FIPS) regional codes. Various aspects of EMS response and care were analyzed, including patient location, transport times, level of care, EMS interventions, and care disposition. Mandatory submission of specific PPCR data is required by regulation. A survey of hospital stroke care capabilities was completed by all 82 qualifying hospitals. Results: From April 2003 through March 2005, 597,812 PPCR had at least one EMS patient assessment provided, with 9,609 (1.6%) designated as stroke/CVA. Analysis of EMS call times (911 call time-hospital arrival time) showed that 94% of Virginia’s population is included in FIPS areas with 60 min. or less average total call time. Physician-generated stroke protocols are available in 10 of 11 EMS regions, all of which include standardized stroke scale assessment. Evaluation of hospital capabilities for stroke care showed that at the beginning of the study period, there were no PSC in Va, and only 3 at the end. Conclusion: This study serves as a model to assess regional compliance with ASA recommendations for EMS stroke care. Despite considerable geographic and system variability, Va EMS can transport the majority of emergency patients to a hospital within an hour, making stroke patients potentially eligible for time-sensitive interventions. Stroke protocols exist and incorporate assessment of Cincinnati Stroke Scale, but are not standardized. There are few primary stroke centers (PSC) in Virginia, limiting EMS ability to transport directly to PSC.

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**Rapidity of Treatment by Intravenous Thrombolysis for Ischemic Stroke in Community Hospitals With Telephone Consultation With Stroke Center**

Ken Uchino, Lori Massaro, Maxim H Hammer; Univ of Pittsburgh, Pittsburgh, PA

Background: Intravenous tissue plasminogen activator (TPA) for acute ischemic stroke must be provided in appropriate setting. In small community hospitals, thrombolysis has been associated with higher rate protocol deviations. There might also be differences in how quickly the treatment is delivered. Methods: From the registry of 281 TPA treatments at a stroke center between January 2002 and October 2005, we reviewed randomly selected charts retrospectively: 51 among those who received TPA at referring hospitals before transfer to the university hospital and a control group of 49 patients who received TPA treatment at the university hospital. The stroke center provides phone consultation for acute stroke to smaller hospitals and instructs thrombolysis before transferring patients. Results: The mean duration from hospital arrival to CT imaging or to TPA administrations did not differ among those treated at community hospitals compared to those treated directly at the university hospital. 67% in community hospitals and 53% in university hospital received head CT within 25 minutes of onset, a guideline recommended target. Discussion: For patients who received thrombolysis for acute stroke presenting in small community hospitals, the rapidity of treatment does not differ from those presenting at a university stroke center. The efforts to improve care should continue to aim at safety and protocol compliance.

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**Development of an Outpatient Palliative Care Program at a University Hospital Heart Center**

David Bekelman, Univ of Colorado at Denver Health Sciences Cntr, Denver, CO

Problem: Heart failure (HF) care could benefit from comprehensive physical symptom management, psychosocial care, and advance care planning. Can an outpatient palliative care program be developed to address these needs? Program Description: The “Supportive Care Program,” is a referral-based one-half day per week clinic located at a University Hospital Heart Center. The program director (Bekelman) is a board-certified internist, palliative care, and palliative medicine specialist. Patients with symptomatic HF are targeted. Patients complete standardized assessment instruments at each visit. Dr. Bekelman provides both consultative and collaborative care. Patients are often seen with family members. Findings: After 6 months, there were 25 patient visits and 12 different patients seen. Median age was 52 years old, 65% were female. Administering standardized, validated instruments to assess heart-failure specific health status, physical symptoms, depression, and anxiety was feasible. Patients reported a median of 14 physical symptoms during the week prior to their visit (measured using the Memorial Symptom Assessment Scale-Short Form). Health status was impaired compared to a previously published Kansas City Cardiomyopathy Questionnaire Score, 52; range, 0–100, higher score indicates better health status). Patients reported high levels of depression and anxiety. The two most common reasons for referral were to evaluate and manage depression and physical symptoms. Patients struggled with living with HF. In the words of one patient, “Living with HF has been– it touches your spiritual life, sex life, family life… It’s kinda rough daily.” Patients were hesitant to talk about the future of their illness. Lessons Learned: 1) Longitudinal assessment of health status, physical symptoms, depression, and anxiety is feasible 2) Depression often stems from loss of function, coping with uncertainty, and fears of the future 3) Nurses initiate the majority of referrals 4) Advance care planning is challenging in this patient population 5) Providers often express appreciation for the program, although referrals are limited Next Step: Obtain funding to test whether a palliative care intervention reduces depression, physical symptoms, and improves quality of life in people with HF.

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**Impact of Stroke Quality Improvement Team on Improving Clinical Outcomes**

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Our health system is a community-based teaching system privately owned with multiple provider groups and inpatient facilities. The first certification as a Primary Stroke Center occurred in October 2004 and re-certification occurred in December 2008. In response to the realization of the critical importance of treating ischemic stroke aggressively, a multidisciplinary team was assembled. The team’s mission, to create the best possible outcomes for our community, has evolved to include representatives from all segments of the stroke care process. The first certification in October 2004, the re-certification in December 2008, and the re-certification currently in progress occurred in response to our efforts to develop a comprehensive, multidisciplinary approach to stroke care. The team includes representatives from the primary care network, hospital clinical services, the hospital stroke team, and the post acute stroke care network. The Stroke Team is improving its outcomes through protocols, standardized care, and collaborative care. Patients are often seen with family members.

1) Longitudinal assessment
2) Standardized assessment instruments at each visit
3) Palliative care specialist. Patients with symptomatic HF are targeted. Patients complete standardized assessment instruments at each visit. Dr. Bekelman provides both consultative and collaborative care. Patients are often seen with family members.

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Lessons Learned:

1) Longitudinal assessment of health status, physical symptoms, depression, and anxiety is feasible
2) Depression often stems from loss of function, coping with uncertainty, and fears of the future
3) Nurses initiate the majority of referrals
4) Advance care planning is challenging in this patient population
5) Providers often express appreciation for the program, although referrals are limited

Next Step: Obtain funding to test whether a palliative care intervention reduces depression, physical symptoms, and improves quality of life in people with HF.
contributing to the reduction in aspiration pneumonia. In conclusion, the process improvement implemented through teamwork had substantial impact on the outcomes in our ischemic stroke patients.

**Limitations of Using the Last LDL Cholesterol to Evaluate Quality of Care**

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**Background:** New pay-for-performance initiatives will penalize physicians whose patients do not achieve specified LDL cholesterol goals. Quality of care for patients with increased coronary artery disease (CAD) risk assesses the last LDL cholesterol value within one year. We hypothesized that many patients at increased risk of CAD would be misclassified by using the most recent LDL value instead of the mean LDL cholesterol. Methods: From 5 primary care clinics in an academic center from 1/1/03–12/30/06, we identified 11562 hypertensive patients at increased CAD risk due to older age (men >45 and women >55) who had LDL measured in 2006. LDL goals according to NCEP are <130 and, for those with diabetes, CAD, or CAD equivalent, <100. We identified the most recent LDL and computed the mean prior LDL over the preceding 2 years. Both types of LDL assessments were classified as passing or failing the NCEP goal. We used the mean value as the gold standard because it better represents the cholesterol control over time and assessed misclassification if the last LDL were used as the quality measure. We also examined the association of patient demographics with cholesterol control based on the last LDL determination.

**Results:** The study population was 31% African-American (AA) and 50% female. Optimal LDL control based on the mean LDL value was achieved by 67% of patients versus 70% using the most recent LDL value. AA patients, overall, had worse LDL control with 60% of AA patients having optimal control with the recent measure, but only 53% were controlled with the average measure. In whites, LDL control was 75% on the recent measure and 73% with the average measure. Overall misclassification was 14%, AA patients are more likely than whites to be misclassified more poorly using the average versus the most recent LDL (11.1 vs. 7.1% P<0.001). **Conclusions:** If physicians are to be paid for meeting quality measures, it is important to recognize that measures based on laboratory values may be more valid if based on several determinations. In this case, 1 of every 7 patients would be misclassified by using the most recent LDL value instead of the mean. These data highlight multiple factors that appear to impact the measurement of cholesterol control.

**Social Isolation/ Alienation & Emotional Distress Are Confounded and Non-Independent in their Association With Early Onset of Coronary Heart Disease**

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**Background:** Among psychosocial risk factors, both Social Isolation/Alienation (SIA)/and Emotional Distress (ED) have been implicated as having prospective predictive value for CHD, but few studies have tested whether they are confounded and/or independent as predictors of event or clinical status. **Methods:** One hundred and two patients with confirmed CHD were administered the Symptom Checklist 90 - Revised (SCL90R) and interviewed for multiple indices of SIA. A friend or spouse provided an independent rating of ED using the Spouse/Friend version of the Ketterer Stress Symptom Frequency Checklist (KSSFC). **Results:** Measures of SIA (SCL90R ED, KSSFC Anxiety, Depression, “AAII” or anger) and two scales from the SCL90R (Anxiety, Psychoticism), were associated with early Age at Initial Diagnosis (AID) or CHD. Among the three scales derived from the SCL90R to quantify SIA, only Feeling Abused was significant. Among the interview measures, only Living Alone as was associated with early AID (but in a counter-hypothetical direction which also being associated with AAII). Only Anxiety survived as a predictor of AID in a multiple regression. **Conclusions:** Present results indicate that SIA and ED are confounded and non-independent in their relationship with AID.

**Cardiovascular-Related Improvement in Quality of Life After Valvular Surgery: Better Captured by Heart Failure–Specific Than With Generic Measures**

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**Background:** Enhancing quality of life (QOL) is a vital objective of heart valve surgery (VS), but assessment has been limited to generic measures that may not specifically reflect cardiovascular changes. We hypothesized that a disease-specific QOL measure would be more responsive to QOL change than a generic measure. **Methods:** As part of a pilot study, we administered the disease-specific Minnesota Living with Heart Failure (MLHFQ) and the generic SF-36 questionnaires preop, and 1 and 6 months postop to 48 patients (pts) (65+ years at vs. 56± years at mitral valve replacement). Spearman’s t-tests compared preop QOL scores in pts with and without HF; paired t-tests evaluated QOL changes. **Conclusions:** These results suggest that after VS, HF-specific measures of QOL show more improvement than generic measures, and if confirmed by larger studies, HF-specific measures should be assessed before and after vs to better determine cardiovascular-related QOL outcomes. Results (table):
Factors Associated With Statin Adherence After Acute Coronary Syndrome

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Background: Statin use in cardiac disease improves morbidity and mortality. However, statin non-adherence is pervasive and greatly attenuates its benefits. Understanding the characteristics associated with statin adherence can help identify potential interventions to improve their use. Methods: Using a national VA cohort, we evaluated one-year statin adherence among 78,504 patients hospitalized with acute coronary syndrome (ACS) between October 2003 and September 2004. Adherence was defined as >80% of days covered with a statin prescription in the year following ACS hospitalization. Multivariable logistic regression analysis was used to identify factors associated with statin adherence, including demographics (age, sex, race, socio-economic status), past medical history (previous CAD, CVD, CHF, DM, dementia, smoking, and hyperlipidemia), ACS treatment factors (cardiology involvement during the index hospitalization and revascularization) and outpatient characteristics (follow-up appointment with a cardiologist within 2 months of discharge). Results: In the year following hospitalization, 51% (4055 of 7892) of patients were adherent to statins. In multivariable regression analysis, factors associated with lower adherence were patients aged >65 years (OR 0.95 per year; 95% CI [0.91–0.99]), higher socio-economic status (OR 1.2; 95% CI [1.1, 1.3]), history of hyperlipidemia (OR 1.39; 95% CI [1.26, 1.54]), receipt of revascularization (OR 1.44; 95% CI [1.29, 1.61]), and having a follow-up appointment with a cardiologist (OR 1.2; 95% CI [1.05, 1.36]). The factors associated with lower adherence included younger age (OR 0.96 per year; 95% CI [0.91–0.99]), history of dementia (OR 0.71; 95% CI [0.61, 0.82]), smoking (OR 0.83; 95% CI [0.75, 0.92]), and history of CVD (OR 0.79; 95% CI [0.64, 0.96]). Conclusions: Non-adherence to statin medications is common following ACS hospitalization and associated with a variety of factors. Understanding these factors may assist in the design of interventions to improve patient adherence to statin therapy and outcomes following ACS hospitalization.

Functional Status Outcomes Improve in Elderly Patients Undergoing Minimally Invasive Heart Valve Surgery

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Background: Elderly patients with valvular heart disease (VHD) can have marked limitation in functional status (FS). Despite advances in minimally invasive valve surgery (MIVS), few studies have evaluated an improvement in FS outcomes during the early recovery period. This prospective longitudinal study measured FS outcomes and the influence of gender, age, and co-morbidities during the first six weeks following MIVS. Methods: A consecutive series of fifty patients (96% Caucasian; 49% female; mean age: 69.8 years (SD 6.45)) completed the Inventory of Functional Status in the Elderly (IFSITE) to measure the actual performance of activities in the personal, household, social/community, leisure, ‘taking care of another’ and work activities and behaviors. These activity limitations were measured at baseline and six weeks following surgery. Results: During the early recovery period, the average increase in FS was 9.3 (SD 5.8) units. The FS increase was greater (p < 0.03) in female patients (8.7, SD 5.2) vs. male patients (7.5, SD 6.5) and in patients aged >65 years (10.2, SD 6.8) vs. patients aged ≤64 years (7.4, SD 5.5). There was no difference in FS by surgical technique (reoperation vs. new valve) or by type of valve used (bioprosthetic vs. mechanical). Conclusions: Minimally invasive valve surgery is associated with an absolute increase in FS. Gender, age and co-morbidities are important to consider during the early recovery period following MIVS.

Trends in Beta-Blocker Use for VA Patients With Heart Failure

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Background: Beta-blockers are known to prolong survival for heart failure (HF) patients with reduced left ventricular ejection fraction (EF). Guidelines recommend using beta-blockers short-term in patients who have had an ACS, and long-term for HF patients with an EF ≤30%. Repeated measures ANOVA with Tukey’s HSD was used to estimate the greatest gains in FS at 2 and 6 weeks post hospital discharge (p < 0.001). For each year following hospitalization, the mean increase in FS was 2.3 (SD 2.1) units per year (p < 0.001). Trends in beta-blocker use have increased over the last decade. Conclusions: Beta-blocker use increased from 82% to 87%, p < 0.001. Older age was associated with less use (odds ratio 0.90 per 10 year increase 95% CI 0.83–0.97) while COATH membership was associated with more use (odds ratio 1.36, 95% CI 1.09–1.68). Use of beta-blockers within the VA system has reached 85% in appropriate patients, and has improved significantly during the last few years. Although only 50% were treated with the beta-blockers recommended by clinical guidelines.

Outcomes of Cardiac Surgery in Dialysis-Dependent Patients: An 11-Year Audit

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Background: Chronic renal failure is a major risk factor for morbidity and mortality in patients undergoing cardiovascular surgery. We evaluated the results of cardiovascular surgery performed on chronic renal failure patients at our center from 1995 to 2006. Methods: Fifty four chronic renal failure patients underwent cardiovascular surgery. Matched controls were selected (n = 54) based on age, sex, year of operation, and occurrence of co-morbid diseases. Results: Chronic renal failure patients had more postoperative complications and higher mortality rates as compared to the control population. Statistically significant differences were observed in mortality rates (12.9 % vs. 3.7 %), prolonged ventilation (31.3 % vs. 8.1 %), and stress (5.5 % vs. 1.8 %) in the postoperative period. Three and five year survival rates were 75.6 % and 72.4 % respectively. Conclusions: Patients on dialysis have an increased morbidity and mortality following cardiac surgery, however we believe end-stage renal failure (ESRF) should not be regarded as an absolute contraindication to cardiac surgery or cardiopulmonary bypass (CPB).

Steps To Success: A Multidisciplinary Program to Target Childhood Obesity

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Background: Childhood and adolescent obesity are at epidemic proportions in the United States. Currently, 25% of all children in the United States are overweight and an additional 50% are at risk of becoming overweight. The purpose of this pilot study was to develop, implement, and evaluate a unique, multidisciplinary after-school pilot program for obese adolescents utilizing diet, exercise and behavioral lifestyle-changing interventions. Methods: This 12 week pilot program provided an after-school exercise and education program for adolescents between the ages of 11 and 15 who were ≥30 pounds overweight or had a body mass index (BMI) ≥26 and who have struggled with obesity for more than one year in duration. A prospective, non-randomized evaluative study design was utilized. Twelve weeks of after-school cardiovascular activities (team sports, dance, martial arts, etc) for 60–90 minutes supervised by a fitness specialist, three days per week. Bi-weekly dietary education sessions and behavioral counseling on psychosocial issues associated with obesity were conducted. Baseline assessments included a health risk appraisal, blood pressure measurement, self-esteem, body image, and nutrition. The program was conducted by a multi-disciplinary team of cardiologists, nurses, exercise physiologists, dieticians and psychologists. Results: (n = 17). 71% female, 76% African American. Mean age = 13.2 yrs. Average weight loss per student = 2.2 lbs at 12 weeks. Weekly physical activity increased 78%. The students decreased their calorie and fat consumption by 50%. Systolic and diastolic blood pressure revealed a trend toward improvement (p = ns) as did health risk appraisal scores (p = ns), health knowledge (p = 0.011), and psychosocial measurements. Conclusions: An after-school, multi-disciplinary interventional program for obese adolescents was established and proven feasible. The Steps To Success pilot program is innovative and beneficial to health outcomes in obese adolescents. WITHDRAWN

Outcomes and Factors Associated With Statin Adherence Among Outpatients With Acute Coronary Syndrome

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Methods: Using national VA and commercial claims data we evaluated the one-year period of statin adherence among 52,429 outpatients with an ACS admitted to VA or commercial hospitals in 2007. Outcomes: The primary outcome was adherence: % of days prescribed covered (pDC) from 0.25 to 0.99. Results: 5,497 patients had no contraindication to beta-blockers. Of the 5,497 candidates for beta-blockers, 4,646 (85%) were treated with a beta-blocker and 2,565 (47%) were treated with a beta-blocker recommended by the ACC/AHA/AATS/STS/TS, 2007 Guidelines. Conclusions: In patients who had an ACS in 2007, beta-blocker use increased from 82% to 87%, p = 0.0001. Hospital characteristics associated with more beta-blocker use included membership in the Council on Teaching Hospitals (COTH) (8 vs. 81%, p < 0.0001). In multivariable analysis increasing age remained associated with less use (odds ratio 0.90 per 10 year increase 95% CI 0.83–0.97) while COTH membership was associated with more use (odds ratio 1.36, 95% CI 1.09–1.63). Use of beta-blockers within the VA system has reached 85% in appropriate patients, and has improved significantly during the last few years. However only 50% were treated with the beta-blockers recommended by clinical guidelines.
Predictors of Surgical Wound Infections After Primary Isolated Myocardial Revascularization


Background: Patients with surgical wound infections (SWI) following cardiac surgery account for a significant number of patients and an understanding of causes and risk factors may help in reducing its incidence. Aim: To determine pre and peri-operative variables and predictors of surgical wound infections in patients undergoing coronary artery bypass surgery (CABG). Methods: Data on 12 reported risk factors was prospectively collected on all patients undergoing CABG surgery at The Aga Khan University Hospital, Pakistan during a five-year period between June 1995 and June 2000. The relationship of potential risk factors and wound complications was evaluated. Results: Out of 767 consecutive patients admitted for CABG surgery, a total of 73 (9.51%) developed post-op surgical wound infections. There were thirty sternal wound infections, 37 leg wound infections at the site of conduit harvest and there were 12 cases of sepsis. There were also 11 urinary tract infections and 2 documented cases of infection at the intra aortic balloon pump site. There was one mortality (0.13%) from deep wound mediastinitis. There were 26 cases (35.6%) of leukocytosis while 17 patients (23.3%) showed elevated erythrocyte sedimentation rate (ESR). Univariate analysis was done, taking a p-value of <0.2 as the inclusion criteria for further analysis using logistic regression. Multivariate analysis showed that diabetes (p<0.002), morbid obesity (p=0.038), use of an intra aortic balloon pump (p=0.001), female sex (p=0.004) and prolonged mechanical ventilation (p<0.0001) were independent predictors of SWI in our study population.

Conclusions: This study suggests that early and strict diabetic control and pre-operative weight reduction may reduce the incidence of post-op SWI after CABG surgery. Contamination of the wound may have occurred before, during and after the operation and efforts to curb such contamination must be intensive. Further prospective studies need to be undertaken to identify and establish these and other risk factors for SWI in the region and elsewhere.

Performance on Hospital Quality Process Measures for Acute Myocardial Infarction and Patient-Level Outcomes: Is There a Link?

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Background: There is intense interest in improving the quality of health care and transparency. Many payers have implemented pay-for-performance programs (P4P) to reward providers who perform better on pre-defined measures of quality. In this study, we evaluated the relationship between hospital level quality as measured by 8-process measures for acute myocardial infarction (AMI) and risk-adjusted in-hospital mortality. Methods: We identified all AMI patients for the years 2004 and 2005 in a large nationally representative non-profit hospital database (Premier’s Perspective Comparative Database, which is a claims database of more than 500 hospitals across the United States). Patient demographics, hospital characteristics, diagnoses, procedures, and patient outcomes were obtained for these inpatient episodes of care. These data were linked to hospital characteristics from the American Hospital Association Annual Survey and hospital quality measures from the Center for Medicare and Medicaid Services Hospital Compare website. Patient and hospital characteristics were used in hierarchical generalized linear models evaluating the relationship between measures of hospital quality and in-patient mortality. Composite scores for the process measures and hospital rankings were calculated as done in the CMS/Premier demonstration project. Results: A total of 191,400 patients with AMI treated at 394 hospitals were identified. The table below presents the associations between composite scores and mortality adjusted for patient and patient characteristics. Conclusion: Despite demonstrated efficacy in randomized settings, we failed to find an association between performance on composite AMI process measures and in-hospital mortality. Variation in risk-adjusted mortality requires further investigation and may be multifactorial and not explained by current process measures.

Global Improvement in Stroke Care is Seen in Get With the Guidelines Hospitals: Potential Performance Measures in Patients Hospitalized for Acute Ischemic Stroke

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Background: Get With The Guidelines (GWTG) is a performance improvement program for hospitalized patients with stroke. Hospitals receive a Performance Achievement Award (PAA) for attaining 85% compliance with 7 performance measures (PM) over time. PAA hospitals collect data on potential performance measures (PPM), but compliance with these is not part of AHA recognition. Compliance efforts for the PPM in PAA hospitals have not been well studied. Methods: Data from patients post-acute ischemic stroke were analyzed from hospitals that had achieved PAA status. The change in compliance for PM and PPM at 4, 8, and 12 quarters was evaluated. Results: There were 19,744 patients from 47 PAA hospitals. The percentage compliance and change in PM over time is shown in Table 1. The percentage compliance and change in APM over time is shown in the Table 2. PAA hospitals improved compliance in all PM and APM over baseline in the first 3 years after participating in GWTG, except for door to CT < 25 minutes and the percentage of complications from the thrombolytic. The composite measure for the 7 PM improved over baseline. Conclusions: System changes made by PAA hospitals also may produce substantial improvement in quality measures that were not hospital-restricted and are not part of the AHA GWTG Performance Achievement Awards.

| Table 1 |
|---------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| PM | Baseline % compliance | Q4 % completion | % change from baseline | p-value | Q4 % compliance | % change from baseline | p-value | Q4 % compliance | % change from baseline | p-value |
|---------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Door to CT ≤ 25 min. ≤ 2 hrs of onset | 84.7 | 71.2 | 46.2 | 0.010 | 88.3 | 89.3 | 0.001 | 90.2 | 90.2 | 0.001 |
| Antithrombotic given ≤ 2 hrs. | 91.2 | 95.9 | 5.2 | <0.001 | 96.3 | 5.3 | <0.001 | 98.0 | 7.5 | <0.001 |
| Anticoagulation at discharge | 84.9 | 99.1 | 14.4 | <0.001 | 96.0 | 4.2 | <0.001 | 99.0 | 4.3 | <0.001 |
| Anticoagulation for AF at discharge | 88.4 | 91.8 | 10.1 | <0.001 | 100 | 11.6 | <0.001 | 96.4 | 7.6 | 0.0003 |
| Decrease CIT risk | 83.4 | 81.3 | 24.6 | <0.001 | 87.9 | 31.8 | <0.001 | 88.3 | 34.5 | <0.001 |
| Tissue plasminogen activator | 59.5 | 81.8 | 37.5 | <0.001 | 66.7 | 50.9 | <0.001 | 66.7 | 50.9 | <0.001 |
| Absolute risk reduction | 63.0 | 79.6 | 26.4 | <0.001 | 84.9 | 34.7 | <0.001 | 87.5 | 36.9 | <0.001 |

| Table 2 |
|---------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| PPM | Baseline % compliance | Q4 % compliance | % change from baseline | p-value | Q4 % compliance | % change from baseline | p-value | Q4 % compliance | % change from baseline | p-value |
|---------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Door to CT ≤ 25 min. | 32.7 | 36.7 | 12.1 | 0.0471 | 38.0 | 8.5 | 0.5885 | 38.0 | 7.1 | 0.1134 |
| Door to CT ≤ 2 hrs of onset | 21.4 | 23.8 | 11.1 | 0.2754 | 25.5 | 5.9 | 0.0046 | 31.7 | 46.0 | 0.0036 |
| Door to CT ≤ 2 hrs of onset ≤ 2 hrs. | 79.2 | 94.1 | 18.9 | <0.001 | 98.5 | 25.7 | <0.001 | 96.6 | 25.1 | <0.001 |
| Door to CT ≤ 2 hrs of onset ≤ 2 hrs. and discharge | 5.7 | 8.1 | 7.1 | 0.5395 | 10.8 | 50.9 | 0.0011 | 2.3 | -58.9 | 0.0008 |
| Door to CT ≤ 2 hrs of onset ≤ 2 hrs. and discharge from ICU | 60.2 | 70.4 | 11.4 | 0.0002 | 75.3 | 19.2 | <0.001 | 78.7 | 21.4 | <0.001 |
| Door to CT ≤ 2 hrs of onset ≤ 2 hrs. and discharge from ICU | 75.7 | 86.1 | 13.6 | <0.001 | 88.8 | 16.3 | <0.001 | 88.5 | 17.0 | <0.001 |
| Door to CT ≤ 2 hrs of onset ≤ 2 hrs. and discharge from ICU | 17.4 | 25.4 | 46.1 | 0.0010 | 26.7 | 53.7 | <0.001 | 28.6 | 61.0 | 0.0003 |
| Door to CT ≤ 2 hrs of onset ≤ 2 hrs. and discharge from ICU | 5.8 | 10.9 | 8.9 | 0.0003 | 11.8 | 105.3 | 0.0002 | 9.5 | 64.3 | 0.1027 |
| Door to CT ≤ 2 hrs of onset ≤ 2 hrs. and discharge from ICU | 34.4 | 41.1 | 16.4 | 0.0012 | 54.3 | 57.7 | <0.001 | 48.2 | 42.0 | <0.001 |
| Door to CT ≤ 2 hrs of onset ≤ 2 hrs. and discharge from ICU | 73.0 | 81.7 | 11.9 | 0.0003 | 88.9 | 21.7 | <0.001 | 91.8 | 25.9 | <0.001 |