

in this population over 5 years as a result of this intervention. Health care payors should consider development of financial incentives to encourage collaborative quality improvement programs.

**1077-74 Marked Underutilization and Geographic Variation in Secondary Prevention Pharmacologic Therapy in Patients With Chronic Angina Undergoing Treatment With Enhanced External Counterpulsation**

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**Introduction:** Despite the importance of antiplatelet agents, beta-blockers, angiotensin-converting enzyme inhibitors (ACEIs), and hypolipidemic agents in patients with chronic coronary artery disease (CAD), several studies have suggested that these agents are substantially underutilized. **Hypothesis:** We sought to describe the contemporary use of these pharmacologic agents among patients with chronic angina who were referred for treatment with enhanced external counterpulsation (EECP). EECP is reserved for patients with angina despite maximal medical therapy and revascularization. We sought to test the hypothesis that there is geographic variation in the use of these therapies in CAD patients. **Methods:** The International EECP Patient Registry (IEPR) enrolls consecutive patients undergoing EECP for chronic angina. We analyzed data on 4388 US patients who underwent EECP for angina and were enrolled in the IEPR beginning in January 1998. US Census definitions were used to categorize patients into 4 geographic regions: Northeast (NE), West, South, and Midwest (MW). **Results:** This study included 1350 NE patients, 463 West patients, 1232 South patients, and 1343 MW patients. Demographic and clinical characteristics, including age, sex, Caucasian race, prior MI, diabetes, and hyperlipidemia, were similar among the 4 regions. Patients in the South had the lowest incidence of prior coronary revascularization, multivessel disease, and quality of life, while having the highest incidence of current smoking (9.5% in South vs 7.6% non-South). Patients in the MW had the highest mean angina class. South patients had the lowest use of cardiac medication, including beta-blockers (55% in South vs 70% non-South; p<.001) and aspirin (65% vs 74%; p<.001). There was no geographic variation in the use of calcium blockers (45% overall), ACEIs (38%), or lipid-lowering agents (70%). **Conclusions:** There is substantial underutilization of antiplatelet agents, beta-blockers, ACEIs, and hypolipidemic agents in US patients with chronic stable angina. Variation across the country is striking, but all areas can improve the care of such patients by increasing the appropriate use of these agents.

**1077-75 Coronary Artery Bypass Grafting: Are We Getting With the Program?**

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**Background:** To minimize future cardiac events, American Heart Association guidelines (1995, 2001) for treatment of patients with coronary artery disease recommended that patients should be discharged on appropriate medications- beta-blocker, ACE inhibitor, aspirin or other anti-platelet medication and cholesterol lowering medication when appropriate. This study examines discharge medicines prescribed patients after coronary artery bypass grafting (CABG).

**Methods:** Data was exported from our STS certified database on 6914 patients undergoing CABG between Jan 2000 and July 2003, and analyzed for the use of beta-blockers, ACE inhibitors, aspirin (or other anti-platelet drug) and cholesterol lowering agent at discharge.

**Results:** At discharge 10.3% of patients were prescribed all four classes of drugs, a further 34.2% received 3 of the drugs, and 4.3% had no drugs prescribed (Table 1) Of patients receiving only 1 drug at discharge, 86% were given aspirin or other antiplatelet medication. When prescribed 2 drugs, 96.0% received aspirin, while beta-blockers were prescribed to 56.9% and cholesterol lowering agents to 32.3% of the patients. In 3 drug regimens, aspirin was used in 99.1%, cholesterol lowering agents in 87.1% and beta-blockers in 84.4% of the patients. Only 29.4% received a prescription for an ACE-inhibitor.

**Conclusions:** Despite published medication guidelines, only 44.5% of patients being discharged after CABG received prescriptions following the recommended drug regimen.

	% with 4 drugs	% with 3 drugs
2000	5.9	29.3
2001	10.9	34.1
2002	15.0	37.7
2003	11.4	42.4
Females/Males	9.0/10.8	31.9/35.0
Caucasian	9.6	34.2
African-American	18.6	31.8
Hispanic	15.1	32.0
Other	17.3	38.9
On Pump/Off Pump	10.2/10.6	32.7/36.3

**1077-76 Holiday Heart: Decreased Use of Evidence-Based Therapies in Patients With Acute Myocardial Infarction Admitted During Holiday Weeks**

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**Background:** Previous studies have found an increased mortality from myocardial infarction in December. We investigated the relationship between the use of evidence-based therapies and admission during holiday weeks.

**Methods:** 134,609 patients in an observational Medicare database admitted with myocardial infarction from 1994-1996 were studied. Patients admitted during the last 2 weeks of December and the first week of January were compared with patients admitted all other weeks. A model adjusting for patient, physician, hospital, and geographic characteristics was used to determine a relationship between week of admission and the use of proven therapies.

**Results:** Patients admitted during the holidays were less likely to receive aspirin, beta blockers or reperfusion therapy, specifically primary coronary intervention (PCI) (Table 1). Mortality in patients admitted during the holidays was also significantly higher at 30 days and 1 year. After adjustment, patients admitted during the holidays remained less likely to receive PCI (RR 0.9, p <0.01).

**Conclusion:** Patients admitted during holiday weeks are less likely to receive evidence-based therapies, specifically primary coronary intervention.

Table 1: Use of Evidence-Based Therapies and Outcomes in Patients with Acute Myocardial Infarction

	Holiday Weeks	Rest of Year	p
Aspirin Use (during admission)	77.2%	78.2%	0.02
Aspirin Use (at discharge)	69.0%	69.5%	0.4
Beta Blocker Use (during admission)	43.3%	44.8%	0.002
Beta Blocker Use (at discharge)	28.7%	30.6%	<0.0001
Reperfusion Therapy	16.3%	17.4%	0.004
Primary Coronary Intervention	12.5%	15.3%	<0.0001
30-Day Mortality	22.5%	20.5%	<0.0001
1-Year Mortality	37.2%	34.9%	<0.0001

POSTER SESSION

**1096 Novel Approaches to Cardiovascular Care**

Monday, March 08, 2004, Noon-2:00 p.m.  
Morial Convention Center, Hall G  
Presentation Hour: 1:00 p.m.-2:00 p.m.

**1096-67 Balloon Mitral Valvuloplasty Performed in Mobile Catheterization Laboratory as Part of Community Outreach Program at Primary Care Hospitals**

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Several patients of pure severe mitral stenosis suffer due to lack of definitive treatment options like balloon mitral valvuloplasty (BMV) in developing countries, due to prevailing socioeconomic conditions. We present a new strategy of taking tertiary level care to people's doorsteps by performing BMV in Mobile Cardiac Catheterization Laboratory near a peripheral primary care hospital as part of a Community Outreach Program. **Method:** This multicentric study performed at 6 centres in India and Nepal was divided into 2 phases. Phase I included 150 patients and all procedures were done with a surgical standby. After the success of Phase I, 210 patients were treated in phase II, without surgical standby. Patients were assessed for suitability for BMV by transthoracic echocardiogram (TTE) & transesophageal echocardiogram (TEE) in phase I and only TTE in phase II. Exclusion criteria were moderate to severe mitral regurgitation (MR), presence of left atrial or appendage clots and a Wilkins' echocardiographic score of > 8. Procedure was done using Inoue Balloon technique with TTE guidance. Results are summarized in the table 1. Age range was 8-80 yrs and 53% were females. **Conclusion:** BMV is feasible and safe even if done in a mobile catheterization laboratory in a primary care hospital setting and can be undertaken without any surgical standby. These results are of immense significance especially in developing countries where lack of facilities preclude treatment of many deserving patients of severe mitral stenosis.

table 1

	Phase I; (n=150)	Phase II (without surgical standby) (n=210)
Procedural success	100%	100%
mitral valve orifice area-Pre-BMV cm <sup>2</sup>	0.81 +/- 0.21	0.85 +/- 0.15
mitral valve orifice area-Post-BMVcm <sup>2</sup>	1.91 +/- 0.38	2.0 +/- 0.40
mitral mean pressure gradient Pre-BMV mmHg	12.5 +/- 4.6	13.1 +/- 3.9
mitral mean pressure gradient Post-BMV mmHg	2.5 +/- 1.9	2.2 +/- 1.6
post BMV significant MR	3 (2%)	5 (2.3%)
complications requiring urgent surgery	0	0

**1096-68 Why Is Echo Sometimes Inaccurate When Assessing Pediatric Heart Disease?**

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**Background:** A number of factors contribute to the performance and interpretation of echocardiographic studies. Our purpose was to explore the determinants of diagnostic error in children undergoing transthoracic echocardiography.

**Methods:** Perioperative findings from consecutive patients undergoing surgery and/or cardiac catheterization from 1998 to 2003, at a single institution, were compared with transthoracic echo results. Factors pertaining to the patient, the performance of the study, and the characteristics of the reader were recorded. These independent factors were analyzed with multiple logistic regression to explain the diagnostic error rate.

**Results:** Information was recorded on 2,341 patients. A diagnostic error occurred in 16% of the cases. The multiple logistic regression model explaining diagnostic error rate is described below:

	Odds ratio for diagnostic error	Standard Error	P-value	95 % CI
Patient imaging judged to be problematic	3.04	0.46	<0.001	0.28-0.47
Digital vs tape acquisition	1.38	0.22	0.045	1.01-1.90
Institution performing echo does >4000 studies/year	0.76	0.27	0.43	0.38-1.50
Echo requisition form present	0.63	0.21	0.17	0.33-1.22
Dedicated echo reader with > 3 years experience at tertiary cardiac center	0.36	0.05	<0.001	0.28-0.47

The odds of diagnostic error were significantly increased if patient imaging was judged to be problematic, and also if images were recorded digitally. An experienced echo reader significantly decreased the odds of diagnostic error. The other two independent variables did not achieve statistical significance in the model.

**Conclusion:** This study identifies factors that affect diagnostic error rate when performing transthoracic echocardiography in children with heart disease. This should help pediatric cardiac centers target specific areas to ensure improved diagnostic performance.

**1096-69 Case Method Learning Is a Cost Effective Implementation Method of Evidence Based Secondary Prevention in Primary Care**

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**Objectives** To study cost effectiveness of Case Method learning (CM) –on lipid lowering in secondary prevention of coronary artery disease (CAD) in primary care.

**Method** A prospective randomized controlled trial in Södertälje, Stockholm County, Sweden. 255 consecutive patients with CAD were included. Guidelines were mailed to all physicians (n=54) and presented at a common lecture. Physicians working at the primary health care centers randomized to the intervention group, participated in recurrent CM learning dialogues at their working site during a two-year period. A locally well-known cardiologist served as a facilitator. Assessment of low-density lipoprotein (LDL) cholesterol in a sample of their patients was performed at baseline and after two years. Analysis according to intention-to-treat – intervention and control groups (n=88) – was based on group affiliation at baseline. Cost of intervention included cost of the attendance of the participants preparation, travel time and seminar time cost of the facilitator; and the increased cost of lipid lowering drugs in the intervention and specialist groups during the study period. Cost are as of 2002 with an exchange rate 1 US \$ = 9.5 SEK (Swedish Crowns).

**Results** Patients in the intervention group had their LDL cholesterol reduced by 0.5 (CI 0.1-0.9) mmol/l as compared to controls (9.3% reduction; p<0.05). No change occurred in the control group. LDL cholesterol in the specialist group decreased by 0.6 (CI 0.4- 0.8) mmol/l (12.6% reduction). Cost of intervention was 48.5 US \$ per patient in the intervention group and 80.9 US \$ per patient in the specialist group. The cost per mmol decrease of LDL cholesterol extrapolated to the duration of the 5.4 years in the 4S study is well within the cost effectiveness of that study.

**Conclusions** CM learning resulted in cost effective LDL cholesterol lowering in the CAD patients treated in primary care well within the effect and costs of a specialist clinic.

**1096-70 Severe Concomitant Conditions, Physician Volumes and Outcomes in Acute Myocardial Infarction**

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**Background.** Studies looking at the relationship between physician (MD) volume and mortality for AMI patients have not adjusted extensively for concomitant conditions. We hypothesize that a substantial proportion of AMI patients present with severe concomitant conditions, and are disproportionately cared for by MDs who treat a low volume of AMI. These severe conditions, that merit admission in their own right, might explain higher mortality rates for low volume MDs.

**Methods.** We examined in-hospital mortality among AMI patients enrolled in NRM12 or NRM13 who were discharged from Yale-New Haven Hospital from January 1997 to June 2000. Average annual Medicare volume was used to create low (<3 AMI patients; below median), mid (3-10), and high volume (11+) categories for attending MDs. NRM1 variables were used to adjust for demographic, cardiac history, clinical presentation, and initial treatment factors. Criteria were created to identify life-threatening (LT) cardiac and non-cardiac conditions at presentation using discharge summaries and NRM1 data. Generalized estimating equation methods were used to sequentially adjust for these factors, using high volume as the referent group.

**Results.** The study included 1,295 AMI patients (mean of 68 years, 41% women, 83% white). Cardiologists treated 19%, 34%, and 98% of AMIs respectively from low to high volume. Presentation of LT cardiac events was similar by volume (12%). Overall, 9% presented with LT non-cardiac events, but varied from low to high volume (19%, 14%, 5%). Unadjusted mortality decreased by MD volume (13.4%, 9.5%, and 6.5%), but was consistently lower for cardiologists within each volume category. Overall, patients seen by low and mid volume MDs had similar comorbid profiles. The unadjusted mortality risk for the mid volume group was eliminated after sequential risk adjustment, whereas the risk for low volume MDs was attenuated but not eliminated (OR 1.7, 95% 0.9-3.0).

**Conclusion.** Almost 1 in 10 AMI patients present with a severe concomitant condition. While patients who present with these serious conditions are more commonly seen by low volume MDs, risk adjustment for these factors does not explain the excess mortality for low volume providers.

**1096-71 A National Survey of Health Care Practitioners' Knowledge of the QT Interval**

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**Background:** Several medications are associated with QT interval prolongation that can predispose patients to a potentially fatal arrhythmia known as torsades de pointes. The safe use of these medications is dependent on health care practitioners' knowledge of the QT interval. We conducted this survey to assess health care practitioners' ability to correctly measure the QT interval and to identify factors and medications that may increase the risk of QT interval prolongation and torsades de pointes.

**Methods:** This cross-sectional national survey was administered between April 2002 and March 2003 to health care practitioners attending Grand Rounds Conferences at six of the top academic institutions in the United States in internal medicine and psychiatry and at six community hospitals in the same geographical areas as the academic institutions. Twenty questions on the QT interval were asked.

**Results:** Of approximately 826 attendees, 517 (63%) completed the survey. Of about 608 attendees of internal medicine conferences, 371 (61%) responded, and of about 208 attendees of psychiatry conferences, 146 (67%) responded. The median number of correct answers for the whole group was 10 (interquartile range 7-13). The median number of correct answers for internists was 12 (interquartile range 9-13), for psychiatrists was 10 (interquartile range 7-13) and for other specialists was 10 (interquartile range 5-13). Respondents who graduated between 1990 and 1999 and academicians performed significantly better overall than other respondents. Of the 517 respondents, 224 (43%) measured the QT interval correctly. Physicians in training, academicians and non-psychiatry specialists were more likely to measure the QT interval correctly.

**Conclusion:** The majority of health care practitioners cannot correctly measure the QT interval and cannot correctly identify factors and medications that can prolong the QT interval. Our findings suggest that educational programs on the QT interval are urgently needed.

**1096-72 Noise Exposure and the Risk of Myocardial Infarction**

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**Background:** Chronic noise exposure has been shown to be associated with increased catecholamine levels and adverse effects on blood pressure and plasma lipids, and may thus contribute to the progression of coronary artery disease.

**Methods:** To determine the potential risk of noise for the incidence of myocardial infarction (MI), consecutive patients admitted to all 32 major hospitals in Berlin with confirmed diagnosis of acute MI were enrolled from 1998 to 2001 in the NaRoMI Study (Noise and Risk of Myocardial Infarction). Controls were matched according to gender, age, and hospital. In standardized computerized interviews conducted during the hospital stay information was obtained on the sources and degree (on a continuous 5 point scale) of noise annoyance. The 10 years work noise exposure levels were determined according to ISO 9921/1. In multiple logistic regression models, the odds ratios (OR) of noise variables were adjusted for cardiovascular risk factors and sociodemographic variables.

**Results:** A total of 4,115 patients (3,054 men, 56+/-9 years, 1,061 women, 58+/-9 years) were included in the study. Annoyance by environmental noise (including street, air and railway traffic, industrial and construction noise) was associated with increased risk of MI in women (OR crude 1.40; 95% confidence interval 1.01-1.94 per unit, OR adjusted 1.30;