

## AFMR Eastern Regional Annual Meeting Abstracts

## Scientific Session I

**DEXAMETHASONE SYNCHRONIZES RESPIRATORY EPITHELIAL REPAIR IN VITRO**

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**Purpose of Study:** Glucocorticoids (GC) are a mainstay of asthma therapy. The current paradigm is that they are anti-inflammatory; however an emerging concept is that GC resynchronize out-of-phase repair processes in damaged respiratory epithelium. Our hypothesis is that injured asthmatic respiratory epithelium is characterized by asynchronous regeneration unresponsive to in vitro conditions that mimic the diurnal levels of endogenous GC, whereas injured normal respiratory epithelium regeneration is characterized by rapid healing induced by GC-induced cell cycle pauses.

**Methods Used:** Primary differentiated human airway bronchial epithelial cells (Mattek, Ashland, MA) from normal and asthmatic donors were grown at an air-liquid interface on collagen-coated Transwell membranes. After a 24 hr incubation in steroid-free medium, confluent cultures were exposed to 20 nM dexamethasone (DEX) and were mechanically wounded. Half of the cultures were pulsed for 2 hours daily with 20 nM DEX. Cells were harvested 48 h after wounding. Cell cycle synchrony was evaluated by flow cytometry for DNA content (7-AAD) in proliferating (BrdU+) cells.

**Summary of Results:** Bright-field microscopy (16x) of DEX+ and DEX-normal culture wounds showed complete healing by 24 and 48 h, respectively. DEX treatment did not visibly alter similarly cultured asthmatic cells, which were still unhealed at 48 h. Normal DEX+ cultures showed significantly more BrdU+ cells in G2 (72.9 vs. 29.5%;  $P = 0.05$ ) and less in G1 (17.6 vs. 63.4%;  $P = 0.02$ ) than asthmatic cells.

**Conclusions:** Proliferating asthmatic cells were more evenly distributed among G1 and G2 than normal cells, consistent with asynchronous cell cycling. Although effective in synchronizing normal epithelium repair, DEX mimicking endogenous levels did not correct asthmatic epithelium asynchrony. Future directions will include increasing DEX dosing to determine if pharmaceutical level dosing can repair asthmatic epithelium asynchrony.

**PRESERVING ANTI-PLATELET ACTIVITY OF ASPIRIN BY PREVENTING HYDROLYSIS**

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**Purpose of Study:** The hydrolysis of aspirin markedly reduces its anti-platelet activity. This has prevented the development of an effective IV formulation of aspirin that would improve the treatment of acute coronary syndromes. We have developed a formulation that we believe would resist hydrolysis and preserve platelet inhibition.

**Methods Used:** Hydrolysis was determined by HPLC and platelet function evaluated ex vivo using the "Verify Now" assay developed by Accumetrics®. Six solutions were prepared: (1) ASA in aqueous solution of 1N NaOH, (2) ASA solution stored for a month, (3) new formulation vehicle, (4) ASA in new formulation freshly prepared, (5) ASA in new formulation stored at 40°C for 1 month, and (6) ASA new formulation stored at 40°C for 6 months. HPLC was performed using a solvent system NaH<sub>2</sub>PO<sub>4</sub>, Na<sub>2</sub>HPO<sub>4</sub>, MeOH with pH adjusted to 3.2 and UV detector set at 230 nm. The "Verify Now" assay required 2 µl of whole blood incubated at room temperature for 30 mins and assays repeated twice in duplicate.

**Summary of Results:** ASA in an aqueous solution showed 57% hydrolysis, but was 99% non-hydrolyzed in the new formulation at all time points studied (freshly prepared, 1 month and 6 months at 40°C). Vehicle solution had no effect on platelet function. Platelet function showed almost no inhibition from aqueous samples, but showed a 37, 37 and 39% platelet inhibition for fresh, 1 & 6 month storage samples. Vehicle solution had no effect on platelet function.

**Conclusions:** Aqueous solutions of ASA hydrolyzes rapidly and this correlates with a diminished ex vivo ASA effect on platelet function. A new formulation of ASA for IV administration shows no hydrolysis at 1 & 6 months of storage at 40°C and this lack of hydrolysis correlates with ex vivo measured platelet inhibition by ASA. Availability of an IV formulation of ASA may be useful in the treatment of acute coronary syndromes to obtain a rapid effect especially in patients who cannot take aspirin orally. The new formulation will remain stable, if stored over prolonged period of time making it potentially clinically useful.

**SEPSIS ALTERS THE MEGAKARYOCYTE-PLATELET TRANSCRIPTIONAL AXIS RESULTING IN PLATELET LYMPHOTOXICITY**

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**Purpose of Study:** Poor outcomes in sepsis are associated with lymphopenia secondary to apoptosis. We hypothesized that responses of platelets to sepsis leads to changes in mRNA expression of cell death-associated genes and that this *de novo* transcriptome would be imparted to platelets by bone marrow megakaryocytes.

**Methods Used:** We studied platelet mRNA and protein in an induced-sepsis model in mice.

**Summary of Results:** Platelet mRNA expression profiles showed progressive induction of a well-defined cell death group (GO:0008219), including potent apoptosis-inducing granzyme B (GzmB). Increased platelet GzmB was confirmed in septic mice and humans via qRT-PCR and flow cytometry. As platelets are anucleate, the increase in GzmB mRNA was likely derived from activated megakaryocytes and this was confirmed by qRT-PCR in CD42d<sup>+</sup> cells from septic bone marrow. Platelets from septic mice, in contrast to control mice, showed significant induction of apoptosis in healthy CD4<sup>+</sup> splenocytes (36 ± 1.4 versus 16.9 ± 6.6%;  $P = 0.031$ ). However, platelets from septic GzmB<sup>-/-</sup> mice induced 55% less splenocyte apoptosis than those from septic WT mice.

**Conclusions:** Our study indicates a direct role for platelet GzmB-mediated lymphotoxicity in sepsis. Our findings establish a novel paradigm in sepsis: megakaryocytes produce platelets with acutely altered mRNA profiles as a function of disease state, and these platelets become active lymphotoxic agents. Given that lymphocyte apoptosis is associated with mortality in sepsis, modulation of megakaryocytes or platelets becomes a new therapeutic target.

**INFLIXIMAB REVERSES SUPPRESSION OF CHOLESTEROL EFFLUX PROTEINS BY TNF $\alpha$ : A MECHANISM FOR MODULATION OF ATHEROGENESIS**

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**Purpose of Study:** TNF $\alpha$  is a pro-inflammatory pro-atherogenic cytokine. Anti-TNF agents modify cardiovascular burden in patients with rheumatoid arthritis. Most show increased HDL and total cholesterol, but long-term effects of TNF- $\alpha$  blockade on lipid pattern are unclear. We investigated the effect of TNF $\alpha$  and the TNF $\alpha$  blocking monoclonal antibody infliximab on reverse cholesterol transport (RCT) proteins. Uptake of modified lipoproteins by macrophages in the vasculature leads to cholesterol overload and atherogenic foam cell formation (FCF). RCT is mediated by specific proteins including ATP binding cassette transporter A1 (ABCA1) and liver X receptor (LXR). These proteins counteract FCF by ridding cells of excess cholesterol. We hypothesize that TNF $\alpha$  and infliximab exhibit their pro- and anti-atherogenic effects respectively via genes involved in RCT.

**Methods Used:** THP-1 human monocytes in RPMI media were incubated (10<sup>6</sup>/ml, 18 hr, 5% CO<sub>2</sub>, n = 3 per condition) under 4 conditions: 1) untreated

control, 2) Interferon (IFN) $\gamma$  (500U/ml), 3) TNF $\alpha$  (100U/ml), and 4) TNF $\alpha$  + infliximab (5  $\mu$ g/ml). Total RNA was extracted (Trizol) and 1  $\mu$ g RNA was used for reverse transcription with oligo dT primers. cDNA was then subjected to real-time PCR for ABCA1 and LXR normalized to GAPDH expression. Means and SEM were calculated and t-tests performed using Graphpad Prism software.

**Summary of Results:** IFN $\gamma$  reduced ABCA1 gene expression to  $0.632 \pm 0.052$  vs.  $1.473 \pm 0.181$  of control,  $P = 0.01$ . IFN $\gamma$  did not alter LXR mRNA. TNF $\alpha$  significantly reduced both ABCA1 and LXR message to  $0.785 \pm 0.159$  vs. control,  $P = 0.04$  and  $0.412 \pm 0.025$ ,  $P = 0.01$ , respectively. Infliximab nullified the TNF $\alpha$  effect by increasing both ABCA1 and LXR expression to  $1.847 \pm 0.167$ ,  $P = 0.01$ , and  $0.747 \pm 0.076$ ,  $P = 0.01$ , respectively vs. TNF $\alpha$  alone.

**Conclusions:** Our data show that TNF $\alpha$  treatment significantly reduces ABCA1 and LXR expression (critical for RCT) in monocytes leading to a pro-atherogenic state. The anti-TNF drug infliximab reversed the effects of TNF by increasing both ABCA1 and LXR message, thereby, maintaining RCT. This is the first report of anti-atherogenic effects of infliximab on monocyte like cells.

#### DELINEATION OF A TIMP-1 CANONICAL NETWORK UNDERLYING ASTHMA SUSCEPTIBILITY

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**Purpose of Study:** Tobacco smoke (TS) exposure induces a respiratory epithelial response that is mediated in part by reactive oxygen species. We sought to increase the understanding of oxidative stress and TS-induced bronchial epithelial changes and their role in asthma using systems biology approaches.

**Methods Used:** Using publicly available microarray data, we analyzed four projects with adequate signal/noise levels using a two-way clustering approach and identified 30 transcripts that were coordinately-regulated both in asthma models and tobacco-exposed human bronchial epithelium. These transcripts were further analyzed in a direct respiratory epithelium oxidative stress model. Further analysis was done in primary differentiated normal and asthmatic human bronchial epithelial (HBE) cells grown at an air-liquid interface on collagen-coated Transwell membranes. HBE cells were exposed to either H<sub>2</sub>O<sub>2</sub> or TS condensate for 1 hour followed by a 23-hour incubation. Subsequent protein levels were measured by ELISA in cell lysates and in apical and basal secretions.

**Summary of Results:** The systems biology approach identified a network centered on tissue inhibitor of metalloproteinase (TIMP)-1, which specifically inactivates matrix metalloproteinase (MMP)-9 in lungs. Furthermore, in vitro analysis showed that the basally-secreted MMP-9:TIMP-1 ratio was 2.5-fold lower in TS-exposed than vehicle-exposed asthmatic respiratory epithelium, a milieu known to favor subepithelial airway remodeling in chronic asthma.

**Conclusions:** We propose that the canonical TIMP-1 network is an oxidative stress pathway critical for the respiratory epithelium response to TS in asthma. Our model suggests that TS-exposed children with asthma are more susceptible to MMP-mediated airway remodeling due to a blunted TIMP-1 response.

#### MAJOR ADVERSE CARDIAC EVENT RATES AT 43 MONTH FOLLOW-UP AFTER BARE METAL VERSUS DRUG-ELUTING STENTS IN PATIENTS WITH ACUTE ST-SEGMENT ELEVATION MYOCARDIAL INFARCTION UNDERGOING THROMBOLYSIS AND PERCUTANEOUS CORONARY INTERVENTION

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**Purpose of Study:** This study investigates the Major adverse cardiac events between bare-metal and drug-eluting stents in patients with ST-segment elevation acute myocardial infarction undergoing thrombolysis and subsequent percutaneous coronary intervention.

**Methods Used:** The incidence of major adverse cardiac events during long term follow up was studied in 376 consecutive patients, out of which 102 (27%) received bare metal stents and 274 patients received drug-eluting stents. Chi square or fisher's exact tests were conducted to investigate statistical significant differences in bare-metal stent and drug-eluting stent groups. Cox regression analysis was conducted to identify significant independent prognostic factors for MACE using backward selection procedure.

**Summary of Results:** Patients with BMS have a 1.8 times higher chance of developing MACE than those using DES after controlling the confounding effects of prior coronary artery bypass grafting surgery and stent width.

**Conclusions:** The present study suggests that there is no increase in rate of acute or chronic thrombosis with DES and that both sirolimus-eluting and Paclitaxel-eluting stents are safe in this setting. The increased incidence of MACE among patients receiving BMS in this study may reflect greater restenosis rates in the presence of the potential coagulation and vascular complication described after thrombolytic therapy.

INCIDENCE OF MACE

Variable	Bare-Metal Stent	Drug-eluting stent	P Value
Myocardial Infarction	4(4%)	8(3%)	NS
Target Vessel Revascularization	16(16%)	27(10%)	NS
Target Lesion Revascularization	11(11%)	22(8%)	NS
Death	11(11%)	22(8%)	0.024
Major Adverse Cardiac Events	25(25%)	40(15%)	0.024

NS Non Significant

Cox regression analysis for independent prognostic factor for MACE

Prognostic Factor	Parameter Estimate	Standard Error	P Value	Hazard Ratio
Prior coronary artery btypass grafting	0.797	0.339	0.019	2.218
Width of stent	-0.816	0.296	0.006	0.442
Bare Metal Stent	0.604	0.259	0.019	1.830

#### CIGARETTE SMOKING AND MALIGNANT MELANOMA: A CASE-CONTROL STUDY

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**Purpose of Study:** Since the late 1970's, several studies have reported an inverse association of smoking with melanoma. Many of these studies are limited by their lack of adjustment for ultraviolet (UV) exposure or skin type. We wish to determine whether this reported inverse association persists after adjusting more precisely for UV exposure history and skin type.

**Methods Used:** We conducted a matched case-control study comprised of 110 melanoma cases and 220 matched controls. Melanoma cases were confirmed through the cohort cancer registry, and were matched to two controls each by age ( $\pm 5$  years), sex, race, and skin type. The following smoking variables were then compared: ever vs. current smokers and volume of cigarettes consumed per day ( $<$  or  $>$  than 20). Additional variables used in analysis measured frequency and duration of sun exposure, as estimated by self-reported number of hours spent outdoors in teens, 20s, 30s, and last 10 years of life. We calculated conditional logistic regression models for the association between melanoma and each of the variables for smoking individually, and then adjusting for covariates.

**Summary of Results:** Cases and controls did not differ significantly in distribution of age, sex, race, education level, or skin type. Regarding smoking history, 40% and 43.6% of cases and controls, respectively, reported ever smoking. A history of ever smoking produced a nonsignificant decrease in risk for melanoma. There was no significant association when comparing current and former smokers to never smokers. There was also no evidence of

a dose-response relationship between melanoma risk and smoking fewer than 20 cigarettes per day or more than 20 cigarettes per day, compared to those who never smoked.

**Conclusions:** We found no association between smoking and development of malignant melanoma. We believe our study provided inferential advantages over previous studies by introducing matching on skin type and controlling for UV exposure history.

**DOWNREGULATION OF G-PROTEIN COUPLED RECEPTOR SIGNALING IN THE PATHOGENESIS OF VIRAL MYOCARDITIS**

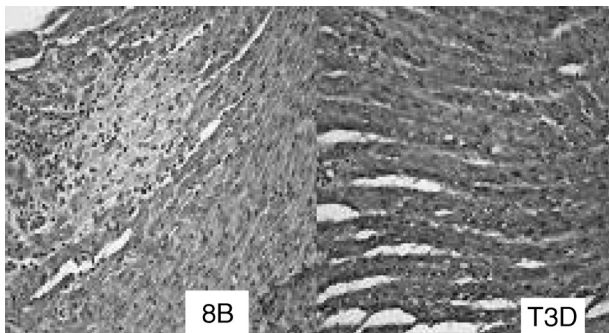
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**Purpose of Study:** To assess the biologic relevance of observed G-Protein coupled receptor (GPCR)-related transcriptional alterations in myocarditic (MYO+) virus-infected cardiac myocytes compared to non-myocarditic (MYO-) virus-infected and mock-infected controls.

**Methods Used:** We performed immunohistochemistry for selected GPCR signaling proteins on cardiac tissues harvested from neonatal mice infected with MYO+(8B) and MYO-(T3D) reoviruses at early and late timepoints preceding (early) and coinciding (late) with histologic evidence of cardiac injury.

**Summary of Results:** Protein expression of GPCR's NPY1R, P2RY4, and OLF49 was markedly reduced in the setting of MYO+ as compared to MYO- viral infection at late time points post infection. Protein expression of RGS16, an inhibitory regulator of GPCR signaling, was increased in the setting of MYO+ viral infection. These differences were most prominent in regions of histologic tissue injury in the setting of MYO+ virus infection.

**Conclusions:** We have demonstrated downregulation of GPCR signaling proteins (downregulation of receptors and upregulation of an inhibitor) in vivo in the setting of MYO+ reovirus infections. Altered GPCR signaling likely plays a biologically significant role in the pathogenesis of reovirus-induced myocarditis by tipping the balance of cellular survival/death regulatory signals toward death. Targeting this pathway may serve as a novel therapeutic intervention for viral myocarditis.



NPY1R expression in myocarditic (8B) compared to nonmyocarditic (T3D) virus-infected cardiac tissue at day 6-7 post-infection.

**PERI-ANESTHETIC ADVERSE EVENTS IN CHILDREN WITH CONGENITAL CARDIAC DEFECTS UNDERGOING PROCEDURES IN THE CARDIAC CATHETERIZATION LABORATORY**

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**Purpose of Study:** Inpatients with a history of congenital heart disease (CHD) are at increased risk for mortality following non-cardiac surgery (1). Therefore, CHD patients are presumably at high risk for adverse events (AE) following manipulations in the cardiac catheterization laboratory (CL). This study quantifies the incidence of peri-anesthetic AE in CHD patients undergoing CL procedures at our institution.

**Methods Used:** Following IRB approval, prospective data for all CHD patients undergoing CL procedures between August and October of 2008 were collected. Outcomes were death, end-organ dysfunction, or alterations in planned care occurring within 72 postoperative hours.

**Summary of Results:** Data are presented in Table 1. 16/88 patients (18.2%) undergoing procedures in the CL experienced AE; institutional QA data yields an 8.2% AE rate for CHD patients undergoing non-cardiac interventions outside of the CL and a 4.2% AE rate for all anesthetized patients. 10/16 AE were cardiopulmonary. 7 patients (5 with cardiopulmonary AE), required significant escalations of care (1 ward and 4 ICU admissions, 1 day of mechanical ventilation, and 5 others).

**Conclusions:** CHD patients with diverse diagnoses, demographics, and biometrics undergoing CL procedures experienced increased AE relative to CHD patients undergoing non-cardiac interventions outside the CL. These data suggest CHD patients anesthetized for CL procedures are at particularly increased risk for cardiopulmonary AE. The only feature distinguishing AE patients from the entire study population was longer duration of anesthesia. This may reflect an increased risk for AE in patients with anatomy requiring more complex manipulations or an effect of longer anesthesia. Additional data are needed to validate these results. (1)Baum. Ped 2000, 105(2):332

TABLE 1.

Patients (N)		Overall	AE	
ASA	1-2 3 4	16 60 12	2 12 2	P=0.83 D=65
Gender	M F	55 33	11 5	P=0.63 D=42
AGE	Mean ± SD (months)	55.1 ± 54.8	54 ± 54.2	P=0.73, D=63
Weight	Mean ± SD (kg)	18.1 ± 14.6	21.1 ± 20.1	P=0.57, D=63
Initial RACHS-I	1-2 3-4 5-6	14 17 26	6 3 4	P=0.29 D= 86
# Cardiac Medications	0 1-2 3+	22 42 26	6 7 3	P=0.54 D= 76
Anesthesia Duration	Mean ± SD (minutes)	163± 73.8	204.6 ± 57	P=0.02 D=98
Diagnosis	Single Vent OHT	N=28 (HPLHS=19) N=26 (DCM=12)	N=5 (HPLHS =2) N=2 (HPLHS=2)	
Outpatient Inpatient Admitted		42 16 30	2 12 2	

**BRIDGING THE GAP BETWEEN CLINICAL AND COMMUNITY RESEARCH: FRACTURE RATES IN CHILDREN AND NEIGHBORHOOD CHARACTERISTICS**

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**Purpose of Study:** Pediatric bone fractures result in substantial morbidity and costs and are increasing in incidence. There is increasing evidence that childhood fractures are related to deficient bone health. Person-level factors may not account for all population variation in risk. Neighborhood contextual effects have been found for many diseases including adult hip fracture. The overall objective of this proposal is to evaluate the relationship between fracture rates in children and neighborhood characteristics that may be associated with fracture risk. We hypothesize that neighborhoods with contextual effects suspected to negatively impact bone health are associated with higher fracture rates when compared with other neighborhoods without these effects.

**Methods Used:** This retrospective study includes 4081 children, ages 0-17, with self-identified residence in Washington DC who were treated for bone fracture in the Children's National Medical Center Emergency Medicine and Trauma Center between January 1, 2003 and December 31, 2006. The unit of analysis was census block group (n = 354); the outcome of interest was fracture rate within the block group. Census data were factor analyzed to reveal independent neighborhood contextual constructs. The factor scores of these constructs served as predictor variables in regression models of fracture rate.

**Summary of Results:** A race and education factor was significantly associated with increased fracture risk. This factor correlated to

neighborhoods with long term blue collar African American residents with lower education levels. Neighborhoods with factor scores indicating a combination of high unemployment, high children-to-families ratio and high rates of rental housing were also significantly associated with increased fracture risk.

**Conclusions:** These preliminary results demonstrate neighborhood contextual effects beyond individual risk factors for bone fracture. This is an essential first step in the development of targeted community-based strategies for fracture prevention. Because forearm fractures may represent a particular fracture location reflecting bone health deficit, future analysis will focus on the subgroup of approximately 1000 children with isolated forearm fracture.

## Scientific Session II

### VITAMIN D INSUFFICIENCY AND BONE MINERAL DENSITY IN AFRICAN AMERICAN CHILDREN WITH FOREARM FRACTURES

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**Purpose of Study:** Half of all children less than 18 years fracture a bone. Fracture rates are increasing. Low vitamin D levels increase fracture risk in infants with rickets and adults with osteoporosis. Limited data available show a high prevalence of vitamin D insufficiency (serum 25-hydroxy vitamin D level <20 ng/mL) in African American children. Vitamin D insufficiency is associated with decreased bone mineral density (BMD). The relationship between vitamin D status and childhood fractures has not been investigated. The purpose of this study is to determine if children with forearm fractures have an increased prevalence of vitamin D insufficiency and decreased BMD compared to fracture-free controls.

**Methods Used:** This case-control study is enrolling cases (African American children, ages 5–9 years, with forearm fracture) and fracture-free controls. Bone health evaluation includes measurement of serum 25-hydroxy vitamin D level and BMD by dual energy xray absorptiometry (DXA) scan. Univariable and multivariable analyses are used to test the associations between fracture status and the independent variables serum vitamin D level and BMD with control for confounding variables.

**Summary of Results:** To date, we have enrolled 28 cases and 17 controls. The mean (+SD) age of cases [7.1 (+1.4) years] and the proportion who were male (61%) did not differ from the controls [7.0 (+1.5) years] and 64% respectively. The mean 25-hydroxy vitamin D level for cases [22.6 (+7.9) ng/mL, (range 10–38 ng/mL)] was significantly lower than that of controls [29.1 (+7.5) ng/mL, (range 15–46 ng/mL)] ( $P = 0.009$ ). More cases (11/28, 39%) were vitamin D insufficient compared to controls (2/17, 11.8%, OR = 4.85, 95% CI = 0.92–25.5). DXA scan results were consistent with normal bony mineralization for age ( $z$ -score > -2) for all patients. The mean total body  $z$ -score for cases [0.6 (+0.9)] did not differ significantly from controls [0.9 (+0.9)] ( $P = 0.25$ ).

**Conclusions:** Mean serum vitamin D levels are significantly lower in African American children with fractures than matched controls. Future analyses will incorporate measurements of calcium and vitamin D intake, physical activity, sun exposure, body mass index and genetic analysis. Vitamin D insufficiency may play a previously unrecognized role in childhood fractures.

### ASSOCIATION BETWEEN RISK OF UPPER EXTREMITY FRACTURE AND WEIGHT STATUS AMONG CHILDREN

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**Purpose of Study:** Rates of upper extremity fractures (UEF) and obesity in children are increasing. In adults, increased weight is associated with increased risk for UEF; data in children are limited. The objective of this study is to determine the association between weight and UEF in children 5–9 and 10–14 years of age by comparing the proportion of patients with UEF and elevated weight for age/gender percentiles to two age-matched control groups: injured patients with sprains and non-injured patients with fever.

**Methods Used:** This is a secondary analysis of data from the Pediatric Risk of Admission (PRISA II) data set of 11,664 randomly selected pediatric patients from 16 US emergency departments. Our analysis included all patients without chronic illness between the ages of 5–14 years and a diagnosis of UEF, sprain or fever. The proportion of patients with weight for age/gender >50th percentile was determined for each group stratified by age group (5–9 and 10–14 years). Logistic regression was used to generate odds ratios.

**Summary of Results:** 337 patients were eligible for inclusion in the analysis. The proportion of patients in each group with a weight for age/gender >50th percentile and the Odds Ratio (95% CI) of weight for age/gender >50th percentile comparing the group with UEF to each control group are displayed in Table 1.

**Conclusions:** The odds of having an elevated weight for age/gender are significantly increased among patients with UEF aged 5–9 years compared to both control groups, while the odds of having an elevated weight for age/gender are significantly decreased among patients with UEF aged 10–14 years compared to patients with sprain. These results may suggest differential injury mechanism or underlying patient vulnerability to fracture, including growth plate physiology, based on weight status in a pre-pubescent versus pubescent populations.

**TABLE 1. Odds Ratio (95% CI) of Weight for Age/Gender > 50th Percentile Comparing UEF to Sprain and Fever Control Groups**

	UEF		Sprain		Fever	
	5-9 y (n=47)	10-14 y (n=67)	5-9 y (n=49)	10-14 y (n=101)	5-9 y (n=57)	10-14 y (n=116)
Number with weight for age/gender > 50th percentile (%)	42 (89.4%)	41 (61.2%)	35 (71.4%)	83 (82.2%)	36 (63.2%)	12 (75.0%)
Odds Ratio (95% CI) compared to Sprain controls	3.4 (1.1-10.2)	0.34 (0.2-0.7)	reference	reference	-	-
Odds Ratio (95% CI) compared to Fever controls	4.9 (1.7-14.3)	0.53 (0.2-1.8)	-	-	reference	reference

### MAJOR ADVERSE CARDIAC EVENTS IN PATIENTS TREATED WITH SINGLE VERSUS MULTIPLE STENTS DURING A SINGLE VESSEL PERCUTANEOUS CORONARY INTERVENTION

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**Purpose of Study:** Although insertion of multiple stents into a single coronary vessel during a single vessel PCI is common, there is no data of the long-term outcome of multiple stents compared to a single stent.

**Methods Used:** The incidence of major adverse cardiac events (MACE) during long-term follow-up including death, myocardial infarction, and target vessel revascularization were studied in 634 patients who underwent a single vessel percutaneous coronary intervention (PCI). Single stent was placed in 319 patients and multiple stents in 315 patients. Stepwise Cox regression analyses were performed to identify significant independent risk factors for MACE using the variables age, gender, race, length of stents, width of stents, type of stent, indications for PCI, coronary artery disease burden, complexity of lesion, prior coronary artery bypass surgery, glomerular filtration rate, smoking, hypertension, diabetes, dyslipidemia, body mass index, and use of drugs which include aspirin, clopidogrel, thrombolytics, glycoprotein IIb/IIIa inhibitors, beta blockers, statins, and angiotensin-converting enzyme inhibitors or angiotensin receptor blockers.

**Summary of Results:** At 47 ± 23-month follow-up, MACE occurred in 61 of 319 patients in single stent group (age 66.3 ± 11.4, 61.4% males) versus 57 of 315 patients in multiple stents group (66.7 ± 11.7, 63.5% males). There was no significant difference in MACE in single versus multiple stent group (19% vs. 18%). This persisted even after controlling for length of the stent(s), complexity of lesion, type of stents and other comorbidities. A significant independent risk factor for MACE was stenting of vein grafts (hazard ratio = 1.94; 95% CI, 1.24–3.03;  $P = 0.0038$ ). Use of drug-eluting stents was a negative independent risk factor (hazard ratio = 0.49; 95% CI, 0.34–0.72;  $P = 0.0002$ ).

**Conclusions:** Implantation of multiple stents in a single coronary vessel was associated with non-inferior clinical outcomes compared to single stents during a single vessel PCI.

#### RELATIONSHIP BETWEEN DIABETES MELLITUS AND METABOLIC SYNDROME FOR PREDICTING CORONARY ARTERY DISEASE

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**Purpose of Study:** Diabetes mellitus (DM) is considered a coronary risk equivalent, while the independent significance of the metabolic syndrome (MetS) is controversial. The purpose of this study was to examine the independent contribution of DM and MetS for the diagnosis of coronary artery disease (CAD).

**Methods Used:** This study included 1000 patients with no history of CAD who presented for elective cardiac catheterization. The study group had a mean age of 62.6  $\pm$  11 years, and was comprised of 571 men and 429 women. Patients were evaluated for MetS using the NCEP-ATP III criteria. DM+ was defined as fasting blood glucose  $>126$  or DM treatment; CAD+ was defined as the presence of at least 70% stenosis in a major coronary vessel or 50% stenosis in the left main coronary artery. Two stepwise logistic regression analyses were performed. The first analysis included DM, MetS and the interaction of DM X MetS entered separately at each step; in the second analysis, the order of the predictors was reversed.

**Summary of Results:** CAD was present in 470 patients; MetS was present in 476 patients; DM was present in 303 patients (see table). Univariate analysis showed that DM ( $P < 0.001$ ) and MetS ( $P < 0.01$ ) were each significant predictors of CAD. In the first regression analysis, DM was a significant predictor of CAD (OR = 1.65, 95% CI: 1.26–2.2;  $P < 0.001$ ); neither the addition of MetS nor the interaction of MetS with DM significantly contributed to the model. In the second analysis, MetS was initially a significant predictor of CAD (OR = 1.41, 95% CI: 1.1–1.8;  $P = 0.007$ ). The addition of DM showed that DM contributed to the presence of CAD over and above the effect of MetS (OR = 1.54, 95% CI: 1.15–2.06;  $P = 0.004$ ); of note, the addition of DM rendered the contribution of MetS non-significant. The addition of the interaction term did not significantly contribute to the model.

**Conclusions:** DM and MetS are each significant univariate predictors of CAD. However, MetS does not provide additional significant predictive value for CAD once DM status is determined.

	DM+		DM-		
	CAD+	CAD-	CAD+	CAD-	
MetS+	135	95	MetS+	115	141
MetS-	34	39	MetS-	186	253

#### THE INDUCTION OF APOPTOSIS AND TNF $\alpha$ BY THE V3 LOOP FRAGMENT OF GP120 IN HUMAN ALVEOLAR PULMONARY EPITHELIAL (A549) CELL MODEL

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**Purpose of Study:** HIV-1 gp120 protein is known to cause apoptosis in different cell types and its fragments can prime CD4+ T cells and human mononuclear cells for apoptosis (Mansur A, Frieri M, Asthma and Allergy Proc 145-9, 2000). TNF $\alpha$  can also induce apoptosis in A549 cells and its expression increased during both early and late stages of HIV-1 infection. Here we determine if V3 loop fragment of HIV-1 GP120 (V3) can induce TNF $\alpha$  and lead to apoptosis of A549 cells by measuring TNF $\alpha$  levels and cell viability.

**Methods Used:** A549 cells were incubated for 48 hours with 20  $\mu$ M of V3. Cells were collected, stained with Annexin-FITC and Propidium Iodide (PI) and analyzed by flow cytometry for 10,000 events. One gate was constructed representing normal cell size and viability with respect to control. Supernatants were collected and TNF $\alpha$  levels determined by quantitative ELISA.

**Summary of Results:** V3 group showed a 54% decrease of total viable events, a 5-fold increase in cell death (Annexin-FITC+ and PI+ cells) and

20% increase in early apoptotic cells (Annexin-FITC+ cells only) versus controls ( $P < 0.05$ ). There was also a 12-fold increase of TNF $\alpha$  in the V3 group versus controls ( $P < 0.05$ ).

**Conclusions:** Compared to controls, the data is consistent with the concomitant release of TNF $\alpha$  with the occurrence of apoptosis.

#### EPIDEMIOLOGY OF BURNS AMONG CHILDREN 12 MONTHS OR YOUNGER IN A TERTIARY CARE PEDIATRIC EMERGENCY DEPARTMENT

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**Purpose of Study:** To characterize the epidemiology of burns among infants resulting in ED evaluation.

**Methods Used:** A retrospective chart review was performed on all patients 12 months of age and younger presenting to a large urban pediatric ED between January 1, 2007 and December 31, 2007 with the chief complaint or final diagnosis of burn. Charts were reviewed to obtain socio-demographic information and details regarding circumstances of injury, including mechanism and location. Univariable statistical tests were used to identify patterns and associations within the study group.

**Summary of Results:** During the study period, 657 patients with burns were evaluated in the ED. 81 (13.7%) were 12 months of age or younger. In this group the mean age was 8.6  $\pm$  2.7 months, 55.5% were male. Of these 81 infant burn cases, 42 (51.9%) had scald burns and 31 (38.2%) had contact burns. Suspicion of non-accidental injury was noted in 7 (8.6%) cases. The most common cause for scald burns was spills (85.7%). The most common sources of contact burns were irons (29.1%) and oven doors (19.4%). Of African American infants (n = 31), 64.5% had contact burns, while 93.8% of Hispanic infants (n = 16) had scald burns ( $P = 0.01$ ). In older infants aged 9–12 months, 44% of burns occurred in the kitchen, as compared to 28% in the 0–8 month group ( $P = 0.16$ ). Neither age nor mechanism of burn were statistically associated with disposition.

**Conclusions:** These preliminary results show that while scald burns still account for the majority of burns in infants, contact burns also comprise a significant number of cases. Racial and ethnic differences in burn risk were also present in our study population. Household objects and appliances appear to be common sources of burns in this age group, which may be due to poor placement of the objects in proximity to infants or their cribs. These objects may be an underappreciated source of danger in the home, and as such may warrant more focus by primary care pediatricians during anticipatory guidance discussions. Future analyses will expand the study period to include additional cases.

#### ADDING HEAT STRESS TO TREADMILL EXERCISE TESTING: THE LONG AND SHORT OF IT

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**Purpose of Study:** Workers potentially exposed to hazardous materials (Hazmat) often incur heat exposures as well. For example, Hazmat training exercises cause body temperature increases of 1.8–2.2°F over 30–60 minutes. We therefore examined testing methodology which might add thermal stress to the exertion created by Bruce Protocol treadmill electrocardiography.

**Methods Used:** We studied actual and potential Hazmat workers who wore gym clothes with (Hot Walk, HW; goal 45 minutes) and without (Standard Bruce, SB) thermally restrictive "SaunaSuits" (SS). Later subjects were tested while wearing the above, plus cotton sweatsuits and a diver's foam neoprene hood. Core temperature was measured sublingually, with tympanic membrane bolometer, and ingested thermistor. Subjective heat stress was estimated by the Young Index (neutral = 4, very hot = 8).

**Summary of Results:** Use of SS during HW led to increases in core temperature equal to those of Hazmat exercises. Similar increases were induced by Bruce Protocol exertion in subjects who wore asweat suit and diver's hood in addition to SS (Hot Bruce, HB). HB is much shorter and hence more practical when testing multiple examinees).

**Conclusions:** Both HW and HB testing induced the desired increase in core temperatures, not achieved by SB testing. The Young Index was  $6.3 \pm 0.9$  for SB vs.  $7.2 \pm 0.7$  for HB ( $P < 0.001$ ). HW simulates actual Hazmat responses but is more time-consuming than HB testing.

Number of Subjects	Age	Body Mass Index	Type of Testing	Treadmill Duration	Core Temp Increase	Rate of Increase	Maximal Heart Rate
	years	kg/sq m		minutes	degrees F	o/minute	beats per minute
84	34.5 +/- 7.9	28.3 +/- 4.6	Standard Bruce	12.2 +/- 2.9	1.1 +/- 0.9	0.069 +/- 0.07	181 +/- 13
33	37.3 +/- 8.8	26.6 +/- 3.0	Hot Walk	41.7 +/- 8.2	2.2 +/- 0.8	0.049 +/- 0.02	167 +/- 17
30	34.4 +/- 9.4	25.7 +/- 3.5	Hot Bruce	14.0 +/- 3.4	2.4 +/- 1.2	0.168 +/- 0.05	176 +/- 11

### A SINGLE INTRAVENOUS DOSE OF SOTALOL INCREASES QT DISPERSION DESPITE RATE CORRECTION

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**Purpose of Study:** Sotalol (S) is known to cause QT prolongation and Torsades de Pointes ventricular tachycardia. The length of QT interval (QT) depends on heart rate (HR) and thus the QT should be HR corrected (QTc). QT dispersion (QTd) may also be effected by HR and thus needs correction (QTcd). The aim of this study was to assess the effects of intravenous S on QT and QTcd.

**Methods Used:** 15 healthy volunteers (age:  $32 \pm 8$  y) gave informed consent and received 62 mg S over 2.5 hr at constant infusion rate. A 12-lead EKG was recorded at baseline, 0.5, 1, 2, 3, 4, and 5 hrs in each subject. The QT and RR intervals were measured by two independent investigators. QTc was calculated for each lead by the Bazett (B), Fridericia (Fi), and Framingham (Fh) formulas. QTcd was calculated as the difference between the shortest and longest QTc.

**Summary of Results:** QTd, QTc and QTcd increased dose proportionally with peak values at 2 hr (See Table). The increments (baseline vs 2 hr) were: QTd  $37 \pm 10$  vs  $60 \pm 21$  ms, 62%,  $P < 0.001$ , B QTcd  $53 \pm 18$  vs  $73 \pm 26$  ms, 38%,  $P < 0.05$ , Fi QTcd  $46 \pm 11$  vs  $55 \pm 18$  ms, 44% ( $P < 0.01$ ), Fh QTcd  $45 \pm 12$  vs  $66 \pm 22$  ms, 47%,  $P < 0.01$ . B QTc  $413 \pm 20$  vs  $430 \pm 23$  ms,  $P < 0.005$ , Fi QTc  $404 \pm 20$  vs  $429 \pm 23$ ,  $P < 0.001$ , and Fh QTc  $405 \pm 19$  vs  $428 \pm 23$  ms,  $P < 0.001$ . After the end of infusion, QTc and QTcd gradually returned to baseline.

**Conclusions:** Intravenous S significantly increases QTc and QTcd in a dose proportional manner, despite the use of HR correction formulas. The Fi and Fh formulas resulted in almost identical QTc and QTcd, while the traditional Bazett formula overestimated the repolarization changes. A single dose of sotalol may cause significant repolarization changes in man increasing the need for caution with S administration.

Time (hr)	Dose (mg)	QTd (ms)	Bazett QTcd (ms)	Fridericia QTcd (ms)	Framingham QTcd (ms)
0	0	37±10	53±18	46±11	45±12
0.5	12.5	46±8**	54±17	50±12	51±13
1	25	52±12***	65±18	60±14**	61±14**
2	50	60±21***	73±26*	66±22**	66±22**
3	62 by 2.5 hr	51±16*	63±21	58±17*	58±18*
4		49±14*	54±14	51±13	51±14
5		47±17	60±19	55±18	54±17

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

### LTA4H SNP rs2660845 IS ASSOCIATED WITH ALLERGIC RHINITIS IN AFRICAN AMERICAN CHILDREN WITH ASTHMA

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**Purpose of Study:** Leukotriene A4 Hydrolase (LTA4H) converts LTA4 to LTB4, decreasing production of cysteinyl leukotrienes (cysLTs). CysLTs

trigger bronchoconstriction, edema and mucous secretions in allergic rhinitis (AR) and asthma. The minor allele of the single nucleotide polymorphism (SNP) rs2660845 A>G, in the upstream region of the LTA4H gene, has been associated with a 4-fold increased likelihood of having an asthma exacerbation in adults receiving montelukast. No reports have been published regarding an association between this SNP and allergic rhinitis. We hypothesize LTA4H SNP rs2660845 is associated with an increased risk of allergic rhinitis.

**Methods Used:** As part of an inner-city African American (AA) asthma study, children between 2–17 yrs were interviewed to determine the presence/absence of AR and associated risk factors. DNA was isolated from buccal swabs and LTA4H genotype was determined by PCR.

**Summary of Results:** The age of children studied ( $n = 112$ ) ranged from 2.1–16.7 yrs (mean  $6.6 \pm 3.6$  yrs). Logistic regression showed independent associations between AR and increasing age (OR = 1.32 [95%CI 1.03–1.7]) as well as with history of parental atopy (7.0 [1.6–30.3]). Genotypes were in Hardy-Weinberg Equilibrium ( $P = 0.09$ ). Atopy acquired before 6 yrs old is an important predictive factor for asthma continuing into late childhood; asthma develops more commonly in patients with rhinitis than in those without. When stratified by age, children <6 yrs old ( $n = 57$ ) were 7 times less likely (0.14 [0.02–0.99]) to develop AR if they had  $\geq 1$  G allele while correcting for sibling and parental atopy.

**Conclusions:** LTA4H rs2660845 is protective against AR in children <6 yrs in our study. We speculate this SNP may protect against AR by increasing LTA4H expression and/or function, thereby shifting the leukotriene balance away from cysLTs, leading to decreased AR symptoms. To better understand these associations, mechanistic studies will be undertaken to elucidate the effect of this SNP on the LTA4H gene and cysLT production.

### PREVALENCE OF OBSTRUCTIVE CORONARY ARTERY DISEASE IN PATIENTS WITH DIABETES MELLITUS WITH AND WITHOUT HYPOTHYROIDISM UNDERGOING CORONARY ANGIOGRAPHY

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**Purpose of Study:** The prevalence of obstructive coronary artery disease (CAD) in patients with diabetes mellitus with and without hypothyroidism undergoing coronary angiography needed to be investigated.

**Methods Used:** Coronary angiography was performed in 173 patients (66% women), mean age 68 years, with diabetes mellitus and hypothyroidism and in a control group of 179 patients (56% women), mean age 66 years, with diabetes mellitus without hypothyroidism because of a recent myocardial infarction or unstable angina pectoris (48% of both groups) or chest pain with a positive stress test (52% of both groups). The prevalence of smoking, hypertension, dyslipidemia and obesity was not significantly different between both groups. Obstructive CAD was diagnosed if there was >50% obstruction of at least 1 major coronary artery.

**Summary of Results:** Greater than 50% obstruction of at least 1 major coronary artery was present in 145 of 173 patients (84%) with diabetes mellitus with hypothyroidism versus in 132 of 179 patients (74%) with diabetes mellitus without hypothyroidism ( $P < 0.025$ ). greater than 50% obstruction of 3 major coronary arteries was present in 69 of 173 patients (40%) with diabetes mellitus with hypothyroidism versus in 39 of 179 patients (22%) with diabetes without hypothyroidism ( $P < 0.001$ ).

**Conclusions:** Patients with diabetes mellitus with hypothyroidism undergoing coronary angiography have a higher prevalence of obstructive CAD of at least 1 major coronary artery and of 3 major coronary arteries than patients with diabetes mellitus without hypothyroidism undergoing coronary angiography.

### VASCULAR COMPLICATIONS AFTER PERCUTANEOUS CORONARY INTERVENTION FOLLOWING HEMOSTASIS WITH THE MYNX VASCULAR CLOSURE DEVICE VERSUS THE ANGIOSEAL VASCULAR CLOSURE DEVICE

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**Background:** The prevalence of vascular complications after percutaneous coronary intervention (PCI) following hemostasis with vascular closure devices needed to be investigated.

**Methods:** We investigated the prevalence of vascular complications after PCI following hemostasis in 190 patients (67% men and 33% women, mean age 64 years) treated with the AngioSeal vascular closure device (AngioSeal) versus 238 patients (67% men and 33% women, mean age 64 years) treated with the Mynx vascular closure device (Mynx).

**Results:** Death, myocardial infarction, or stroke occurred in none of 190 patients (0%) treated with AngioSeal versus in none of 238 patients (0%) treated with Mynx. Major vascular complications occurred in 5 of 190 patients (2.6%) treated with AngioSeal versus 5 of 238 patients (2.1%) treated with Mynx (p not significant). Major vascular complications in patients treated with AngioSeal included hematoma >5 cm (0.5%), removal of malfunctioning device (1.1%), hemorrhage requiring intervention (0.5%) and hemorrhage with loss of >3 g Hgb (0.5%). The major vascular complications in patients treated with Mynx included retroperitoneal bleed requiring surgical intervention (0.8%), pseudoaneurysm with surgical repair (0.8%) and hemorrhage with loss of >3 g Hgb (0.4%). These complications were not significantly different between the 2 vascular closure devices ( $P = 0.77$ ). Minor complications included device failure requiring >30 minutes of manual compression after device deployment and occurred in 7 out of 190 patients (3.7%) treated with AngioSeal versus 22 of 238 patients with Mynx (9.2%) ( $P = 0.032$ ).

**Conclusions:** Major vascular complications after PCI following hemostasis with vascular closure devices occurred in 2.6% of 190 patients treated with the AngioSeal vascular closure device versus in 2.1% of 238 patients treated with the Mynx vascular closure device (p not significant). The Mynx vascular closure device appears to have a higher rate of device failure. 605387

#### PATIENTS WITH DIABETES MELLITUS WITH ISCHEMIC STROKE HAVE A HIGHER HEMOGLOBIN A1C LEVEL AND A HIGHER SERUM LOW-DENSITY LIPOPROTEIN CHOLESTEROL LEVEL THAN DIABETICS WITHOUT ISCHEMIC STROKE

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**Purpose of Study:** To investigate the association between the hemoglobin A1c level and the serum low-density lipoprotein (LDL) level in diabetics with and without ischemic stroke.

**Methods Used:** The patients included 408 consecutive patients with diabetes mellitus and ischemic stroke and 404 consecutive age-matched and gender-matched patients with diabetes mellitus without ischemic stroke. There were no exclusion criteria. Ischemic stroke was diagnosed in all patients by a neurologist and confirmed by magnetic resonance imaging or brain computed tomography. Blood samples for hemoglobin A1c levels and serum LDL cholesterol levels were drawn within 1 month prior to the ischemic stroke. The study duration was 2 years.

**Summary of Results:** The prevalence of race, hypertension, use of statins, current smoking, obesity, carotid arterial disease, obstructive coronary artery disease, prosthetic valve, and atrial fibrillation was not significantly different between diabetics with and without ischemic stroke. The hemoglobin A1c level was <7.0% in 141 of 408 diabetics (35%) with stroke and in 221 of 404 diabetics (55%) without stroke ( $P < 0.001$ ). The serum low-density lipoprotein (LDL) cholesterol was <100 mg/dl in 164 of 408 diabetics (40%) with stroke and in 269 of 404 diabetics (67%) without stroke ( $P <$

Prevalence of a hemoglobin A1c < 7.0 % and of a serum low-density lipoprotein cholesterol <100 mg/dl and <70 mg/dl in patients with diabetes mellitus with and without ischemic stroke

Variable	Diabetes With Stroke (n=408)	Diabetes Without Stroke (n=404)	p Value
Hemoglobin A1c < 7.0%	141 (35%)	221 (55%)	<0.001
Serum LDL cholesterol <100 mg/dl	164 (40%)	269 (67%)	<0.001
Serum LDL cholesterol <70 mg/dl	34 (8%)	127 (31%)	<0.001

0.001). The serum LDL cholesterol was <70 mg/dl in 34 of 408 diabetics (8%) with stroke and in 127 of 404 diabetics (31%) without stroke ( $P < 0.001$ ).

**Conclusions:** In conclusion, diabetics should have their hemoglobin A1c level reduced to <7.0% and their serum LDL cholesterol reduced to <70 mg/dl.

#### ETHNIC DIFFERENCES IN BODY SIZE PERCEPTIONS

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**Purpose of Study:** To explore ethnic differences about self-perceived body image.

**Methods Used:** A cross-sectional survey was conducted of 306 women in an urban primary care clinic to evaluate perceptions and attitudes regarding cardiovascular health. Demographics, socioeconomic status and clinical biomarkers were collected. Participants were asked to choose a female silhouette that most resembled their body size and respond to questions regarding weight loss, dieting and exercise.

**Summary of Results:** Of the 306 women, 16% were White, 10% Black, 73% Hispanic and 1% Other, with Hispanics significantly ( $P < 0.05$ ) younger (W: 59 +/- 14 yrs, B: 55 +/- 16 yrs, H: 47 +/- 15 yrs) and less educated (W: 16.9 +/- 2.0 yrs, B: 14.1 +/- 3.2 yrs, H: 10.4 +/- 4.2 yrs) than Whites or Blacks. Overall, 62% were overweight or obese and 71% correctly perceived themselves as underweight, normal weight, or overweight. Incorrect perceptions most frequently involved underestimation of true weight (23%). Hispanic women had a significantly lower age adjusted odds ratio for correctly perceiving their weight (OR = 0.37, 95% CI 0.16-0.85;  $P = 0.02$ ) and a much greater age adjusted odds ratio for weight perceptions that were too low (OR = 22.1, 95% CI 2.9-166.7;  $P = 0.003$ ). Even among college graduates, Hispanic women were more likely to underestimate their weight (14% vs. 2%, age adjusted OR = 11.5, 95% CI 1.2-106.1;  $P = 0.03$ ). Compared to an independent observer, Hispanic women were significantly more likely to underestimate their true body size silhouette when compared to White women (59% vs. 25%;  $P < 0.0001$ ). Among overweight and obese women, there were no significant ethnic differences in the ability to diet or the proportion actually trying to diet. However, Hispanic women were less concerned about their weight (age adjusted OR = 0.12, 95% CI 0.02-0.95;  $P = 0.04$ ).

**Conclusions:** While the majority of subjects were overweight or obese, perceptions and attitudes among Hispanic women differed from Whites in that they underestimated their weight more frequently and were less concerned about being overweight or obese. These patterns persisted even among college educated women. Physicians ethnic differences in the ability to communicate true weight status to patients in order to dispel cultural misconceptions about perceived body size.

#### WOMEN'S HEALTH - WHICH WOMEN WILL BENEFIT FROM CORONARY ARTERY DISEASE RISK FACTOR MODIFICATION?

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**Purpose of Study:** Lack of awareness of CVD as the leading cause of mortality in women is well documented and may be associated with inattention to risk factor modification.

**Methods Used:** This study addressed the cardiovascular risk of individual women. Risk for a CV event in the next 10 years was calculated based on age, total cholesterol, smoking, blood pressure, and LDL levels for 100 women. Recommendations were made based on CV risk profile. The women were then contacted between 6 and 12 months later to evaluate lifestyle changes.

**Summary of Results:** Mean age of the women was 53 years. Hypertension was present in 32% of of the study group (national average [NA] 33%), and 25% had a family history of early CAD. Sixty-six percent were overweight (NA 67%), with 37% being obese (NA 30%). Active tobacco use was noted in 5% (NA 34%). Sedentary lifestyle was noted in 33% (NA 67%). LDL was elevated in 23%, triglycerides in 19%, and low HDL in 29%. Average SBP was 128 mmHg, and DBP 77 mmHg. Average BMI was 28.6 and average weight of 168 pounds. Average LDL was 105, triglycerides level was 104, and HDL 59. Of the women screened, 82% were advised to make dietary changes and 77% to either start or increase

their exercise regimen. Weight loss was advised for 49%. Smoking cessation was recommended for 5%. Based on symptoms disclosed during the office visit, stress testing was recommended to 5% of women, and follow up with a cardiologist to 8%. At follow-up most of the women reported that they had been aware of their risk factors. Only 19% reported that they were made aware of risk factors they did not know about. However, despite our population having high initial awareness of CVD and lower than average initial risk factors for CVD, most (80%) women reported that they did make significant changes in their lifestyle based on the recommendations.

**Conclusions:** Even in a relatively healthy and aware population of women, education relating to CVD risk factor modification has benefit. The lower rate of smoking and higher rate of physical activity in our study group compared to national averages may be related to their socioeconomic background. The study participants had an average gross income of \$68,758, compared to average income in Kansas (\$44,591), and the US (\$51,642) ( $P < 0.001$ ).

### THERAPY OF PATIENTS HOSPITALIZED FOR HEART FAILURE WITH ABNORMAL VERSUS NORMAL LEFT VENTRICULAR EJECTION FRACTION

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**Purpose of Study:** To investigate in a university hospital the therapy of patients hospitalized with heart failure.

**Methods Used:** The present prospective study investigated in a university hospital the treatment of 200 consecutive patients hospitalized with heart failure, 50% with an abnormal LVEF and 50% with a normal LVEF. LVEF was measured by 2-dimensional echocardiography. An abnormal LVEF was  $<50%$ . Student's t-tests were used to analyze continuous variables. Chi-square tests were used to analyze dichotomous variables.

**Summary of Results:** The present study showed that patients with heart failure and normal LVEF were significantly older ( $P < 0.001$ ) and included significantly more women than men ( $P < 0.001$ ) than patients with heart failure and abnormal LVEF. The major cause of heart failure was coronary artery disease in patients with abnormal LVEF and hypertensive heart disease in patients with normal LVEF.

**Conclusions:** The present study showed that patients hospitalized for heart failure in a university hospital were treated adequately according to recommended guidelines. Although in-hospital mortality was significantly increased in patients with heart failure and an abnormal LVEF, the duration of hospitalization and the NYHA class at discharge were similar in patients with heart failure and abnormal or normal LVEF.

Variable	Abnormal LVEF (n = 100) No. (%)	Normal LVEF (n = 100) No. (%)	p Value
Men	72 (72%)	37 (37%)	<0.001
Women	28 (28%)	63 (63%)	<0.001
Age (years)	69 ± 9	77 ± 9	<0.001
Whites	69 (69%)	75 (75%)	NS
Nonwhites	31 (31%)	25 (25%)	NS
Number of hospitalizations in prior year	1.26 ± 0.48	1.31 ± 0.52	NS
Coronary artery disease	69 (69%)	23 (23%)	< 0.001
Hypertensive heart disease	11 (11%)	73 (73%)	< 0.001
Nonischemic cardiomyopathy	17 (17%)	0 (0%)	<0.001
Aortic stenosis	0 (0%)	3 (3%)	NS
Diabetes mellitus	1 (1%)	1 (1%)	NS
HIV	2 (2%)	0 (0%)	NS

NS = not significant; HIV = human immunodeficiency virus

Variable	Abnormal LVEF (n = 100) No. (%)	Normal LVEF (n = 100) No. (%)	p Value
In-hospital mortality	7 (7%)	1(1%)	<0.05
Duration of hospitalization (days)	7 ± 3	7 ± 3	NS
NYHA class at discharge	2.56 ± 0.24	2.52 ± 0.27	NS

NS = not significant

### CARDIOVASCULAR COMPLICATIONS FOLLOWING LIVER TRANSPLANTATION

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**Purpose of Study:** While liver transplantation has achieved longer survival rates over the past decade, chronic adverse effects of therapeutic drugs required for rejection can lead to many physiological changes. The purpose of this study is to identify changes in the cardiovascular profiles of patients after receiving liver transplantation.

**Methods Used:** Medical records were reviewed of all patients who received orthotopic liver transplantation (OLT) at Westchester Medical Center/New York Medical College from July, 2004 to October, 2008. The charts were reviewed for indications for transplantation, medical diagnoses before and after transplantation, medication use, and long-term mortality. The 200 patients in the study included 115 men and 85 women, mean age 58 ± 10 years. The mean follow-up was 24 ± 13 months.

**Summary of Results:** Out of 200 patients, the main indications for transplantation were hepatitis C-induced cirrhosis in 100 patients (50%), alcoholic cirrhosis in 58 patients (23%), and cryptogenic cirrhosis in 25 patients (13%). Hepatocellular carcinoma was present in 46 patients (23%) at the time of transplantation. Out of 200 patients, hypertension was present in 35 patients (18%) pre-OLT and in 106 patients (53%) post-OLT ( $P < 0.001$ ), diabetes mellitus in 48 patients (24%) pre-OLT and in 81 patients (41%) post-OLT ( $P < 0.001$ ), congestive heart failure in 0 patients (0%) pre-OLT and in 9 patients (5%) post-OLT ( $P < 0.01$ ), coronary artery disease in 8 patients (4%) pre-OLT and in 20 patients (10%) post-OLT ( $P < 0.05$ ), dyslipidemia in 11 patients (6%) pre-OLT and in 53 patients (27%) post-OLT ( $P < 0.001$ ), and atrial fibrillation in 4 patients (2%) pre-OLT and in 13 patients (7%) post-OLT ( $P < 0.05$ ). Death occurred in 54 of 200 patients (27%) during follow-up.

**Conclusions:** Cardiovascular complications play an important role in the long-term morbidity and mortality of liver transplant recipients. More research is needed in the management strategies of major risk factors for cardiovascular disease following liver transplantation.

### Cardiovascular profiles & death

Total death	Hypertension	Diabetes mellitus	Congestive heart failure	Coronary artery disease	Dyslipidemia
54	28 (52%)	34 (63%)	4 (7%)	9 (17%)	21(39%)

### GELATINOUS TRANSFORMATION OF BONE MARROW: A RARE PRESENTATION OF MYELODYSPLASTIC SYNDROME

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**Purpose of Study:** Gelatinous bone marrow transformation is a rare disorder associated with MDS.

**Methods Used:** A 53 years old female was evaluated for pancytopenia. Her presenting complaint was severe fatigue, weight loss and easy bruising. No previous history of exposure to chemotherapy, radiation, chemicals, herbal medicine. She has no risk factors for HIV infection. She was on levothyroxin for hypothyroidism. Physical examination was significant for conjunctival pallor and a few echymotic patches on her feet bilaterally. Her body weight was less than ideal body weight. Routine blood count revealed low WBC of 1920/ $\mu$ l, RBC of  $2.13 \times 106/\text{mm}^3$ , hemoglobin of 7.59 g/dL, platelet count of 24,000/ $\text{mm}^3$ . Peripheral smear, coagulation profile, CMP and Vitamin B12, folate levels were normal. Tests for hepatitis panel and HIV serology were negative. There was no evidence of malabsorption and no monoclonal proteins detected in serum or urine. Imaging studies were unremarkable. Bone marrow aspirate was scanty but showed marrow elements from all the three lineages, normal maturation with marked hypocellularity and abundant homogenous pink stained amorphous substance. Marrow core biopsy revealed hypocellularity with infiltration of mucopolysaccharides in the marrow space consistent with gelatinous transformation. No change in the blood counts after completing 4 weeks of vitamin B12 and hyperalimentation. Did not respond to thalidomide 200 mg followed by Gm-CSF and Promega. Repeat BM aspirate and biopsy showed no significant change. No change in counts after treatment with ATG and cyclosporine. Subsequent peripheral smear showed 5–10 percent blast and FISH analysis identified

deletion of the long arm of the chromosome 7. She was treated for MDS but progressed to AML.

**Summary of Results:** Gelatinous bone marrow transformation is a rare disorder of unknown pathogenesis, associated with starvation and other chronic debilitating illness. Gelatinous marrow transformation has been reported later stages in patients who have MDS and acute leukemia. The presence of monosomy 7 indicates the presence of MDS as the hematological disease. Bone marrow aspirate was initially scanty to determine MDS.

**Conclusions:** Our observation highlight the fact that diagnosis of MDS and acute leukemia is difficult when bone marrow is replaced by mucopolysaccharides.

### PREMATURE CORONARY ARTERY DISEASE (CAD) IN THE RUSSIAN IMMIGRANT POPULATION: DATA FROM A NEW YORK CITY HOSPITAL

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**Purpose of Study:** Coney Island Hospital, a multi-site community medical center in Southern Brooklyn, serves a population mainly comprising of Russian immigrants. High incidence of premature Coronary Artery Disease (CAD) among the Russian immigrants was reported by the Department of Cardiology at our hospital. So, we hypothesized that premature CAD was a characteristic of CAD seen in this population.

**Methods Used:** A retrospective observational study was designed utilizing the database from the Cardiac Catheterization Laboratory. All patients who presented to the Emergency Room with chief complaints of angina or anginal equivalents; who further underwent catheterization; and had a significant CAD (>70% stenosis of at least one vessel on coronary angiography) from 2003 – 2005 were included in the study. The patient population was divided based on immigration status as Russian (born in Russia) and Non-Russian. Premature CAD was defined as >70% stenosis of at least one vessel on coronary angiography in males <45 years of age and females <55 years of age. The data was analyzed and tested for significance using FISHERS EXACT Test for proportions and CHI-SQUARE test.

**Summary of Results:** Data from 336 Russian patients and 251 Non-Russian patients was available for evaluation and comparison. Significant CAD was noted in 320/336 (95%) Russian patients and in 152/251 (60%) Non-Russian patients. Average age of Russian patients with significant CAD was 52 ± 10 years and 64 ± 10 years among Non-Russian patients. Of the 320 Russian patients with CAD 163[50%] had premature CAD compared with only 9 out of 152[6%] Non-Russian patients [ $P < 0.05$ ]. Among Russian patients, 28 were less than 40 years of age, and only 1 Non-Russian patient was less than 40 years of age.

Of the 163 Russian patients with premature CAD, 7 needed CABG and 21 needed PTCA/Stent, compared to 1 and 6 patients respectively among Non-Russian patients.

Risk factors among Russian patients with premature CAD was smoking 88[53%], HTN 113[69%], DM [32%], hyperlipidemia [56%].

**Conclusions:** Premature CAD is a feature of CAD seen in Russian immigrant population. No unusual risk factors were noticed in this group. A high index of suspicion for CAD is needed when evaluating young Russian patients presenting to ER with angina or anginal equivalents like shortness of breath.

### DO LOW HDL-LEVELS AND DIABETES MELLITIS INDEPENDENTLY PREDICT EXTENT OF CORONARY ARTERY DISEASE?

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**Purpose of Study:** Diabetes mellitus (DM) is a coronary risk equivalent, and serum HDL levels are inversely related to risk of CAD. This study evaluated the effect of DM and HDL on the extent of CAD.

**Methods Used:** The study included 1000 patients without history of CAD who presented for elective cardiac catheterization, including 571 men and 429 women (mean age 62.6 ± 11 years). The group was divided according to DM (defined as fasting blood glucose ≥126 or DM treatment) and HDL

above/below 47 mg/dl (median HDL for the entire group). Relationships of these factors to CAD were evaluated with Pearson chi-square test and multinomial logistic regression analysis.

**Summary of Results:** DM+ was present in 30% and HDL ≤47 was present in 51.5% of the study group; there was a very weak correlation between the presence of DM and the HDL group. DM+ group was significantly more likely to have CAD than DM- group ( $P = 0.001$ ). The HDL ≤47 group (mean HDL 38.3 mg/dL ± 6.1) was significantly more likely to have CAD than the HDL >47 group (mean HDL 61 ± 12.4),  $P < 0.001$ .

Multinomial logistic regression with 3 levels of outcome (reference group 0 CAD) revealed that HDL, but not DM, is a sig predictor of 1V CAD (OR .75; CI 1.06–2.06;  $P = 0.02$ ). HDL group and DM are independent predictors of multivessel CAD (OR 2.19, 95% CI 1.6–2.96,  $P < 0.001$  and OR 0.57, 95% CI 0.39–0.79,  $P = 0.001$ , respectively).

**Conclusions:** In this study of patients referred for elective cardiac catheterization, HDL ≤47 and DM were independent predictors of multivessel CAD, while only the low HDL group predicted 1VD.

CAD	Patients with DM (DM+)			Patients without DM (DM-)			
	0	1VD	2/3Vd	CAD	0	1VD	2/3VD
HDL≤47	59	43	77	HDL≤47	174	63	99
HDL>47	75	19	30	HDL>47	221	70	68
	p<.001			p<.004			

### EPIDEMIOLOGY OF POST-ANESTHESIA ADVERSE EVENTS IN THE PEDIATRIC PACU

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**Purpose of Study:** In this study, we used our Post-Anesthesia Quality Analysis Questionnaires(QAs), to determine whether patient's age, ASA status are predictive risk factors for pediatric adverse events (AE) reported in the anesthetic recovery area (PACU).

**Methods Used:** After IRB approval, we included for analysis all Post-Anesthesia QAs of patients <21 years from November 1st 2007 through May 31st 2008. The PACU nurse assigned to each patient completed the QA form which included information on patient's ASA status, age, gender, occurrence and type of AE. The types of AEs were categorized as: respiratory, cardiovascular, temperature-related, pharmacological, emergence agitation delirium (EAD), nausea/vomiting, trauma and others. We excluded patients who had any reported intra-anesthetic AE or incomplete information. The observation period was from patient's first vital recording until discharge from the PACU. Data were analyzed with unpaired t-tests, chi-square or Fisher exact tests as appropriate;  $P < 0.05$  was considered significant.

**Summary of Results:** 2711 patients were included. We excluded 106 patients due to incomplete information or age >21 years and 83 due to intra-anesthetic AE. 1710 patients were patients from operative areas and 1001 from non-operative areas. 25% of patients (n = 676) had ASA status ≥III. 9.7% of patients (n = 262) were younger than 12 months. 61.9% (n = 1678) were males. The overall AE incidence was 6.4%, irrespective gender. Mean age was comparable for patients who had AE (92.8 ± 68 months, average ± SD) and those who did not have AE (90.5 ± 68.3 months, average ± SD). Patients with ASA status ≥III had a greater AE incidence (10.1%) than those with ASA status I/II 5.2%,  $P < 0.01$ . The most common AE were nausea/vomiting (2%), temperature-related (1.9%) and EAD (1.3%). Patients with ASA status ≥III had more EAD (2.4% versus 0.9%), cardiovascular (0.6% versus 0.01%) and temperature-related (3.7% versus 1.3%) AEs compared to patients with ASA status I/II (for all,  $P < 0.01$ ).

**Conclusions:** ASA status was a predictor for reported AEs in the PACU. EAD, cardiovascular or temperature-related AEs occurred more frequently in patients with ASA status ≥III versus those whose ASA status were I/II. In contrast, ASA status had no effect on nausea/vomiting or respiratory AE. Age also had no effect on the occurrence of reported AEs in the PACU.

### SEX DIFFERENCES IN PACU OPIOID REQUIREMENTS IN CHILDREN FOLLOWING ENT SURGERY

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**Purpose of Study:** Interindividual difference in pain tolerance and opioid response is a complex issue and various mechanisms have been hypothesized. The purpose of this study is to determine whether sex differences in opioid responses are present in the absence of neurochemical and gonadal hormonal influences by evaluation of opioid responsiveness in a group of pre and early pubertal children undergoing elective tonsillectomy and/or adenoidectomy.

**Methods Used:** Following IRB approval, 53 patients 11 years old or younger ( $5.6 \pm 2.0$  years, means  $\pm$  SD) undergoing elective tonsillectomy and/or adenoidectomy were enrolled in this prospective observational study. All patients received a standardized general anesthetic. Vital signs and pain scores were assessed and recorded by the nurse in the recovery room. Pain management consisted of standardized boluses of morphine, with a maximal frequency of three doses before acetaminophen with oxycodone was administered as a "rescue" pain medication. Data were analyzed using Chi-square or Fisher's exact test, as appropriate.  $P < 0.05$  was deemed significant.

**Summary of Results:** Our study consisted of 30 males and 23 females, with the groups similar in age and weight. There were however more females who were Hispanics than males (females 17/22, males 14/30:  $P = 0.02$ ). Upon arrival in the PACU, initial pain scores and vital signs (heart rate, oxygen saturation and respiratory rate) were similar in both groups. Both groups received comparable doses of intraoperative fentanyl and post-operative morphine. The need for rescue medications however was greater in females than males, with 5/23 females requiring rescue medications and 1/31 males needing a rescue ( $P = 0.03$ ).

**Conclusions:** The causes for inter-individual differences in opioid requirement are multifactorial, with sex being an important consideration. In an effort to minimize confounders such as female menstrual cycle, anxiety, depression, sociocultural variables and differences in gonadal hormone levels, we chose this patient population of pre and early pubertal children. Our preliminary results suggest that there is a sex difference in the requirement for rescue medication in this patient population.

## USES OF THE SOCIAL WORKER IN THE PEDIATRIC EMERGENCY DEPARTMENT

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**Purpose of Study:** To characterize the reasons for social work consultation and the epidemiology of involved patients in a large, urban pediatric emergency department (ED). We hypothesize that social work consultation will be obtained for a limited number of primarily supportive indications.

**Methods Used:** This retrospective chart review included all patients who presented to a large, urban pediatric ED between July 1, 2007 and June 30, 2008 and received social work consultation in the ED. Sexual assault and mental health difficulties were excluded, as social workers from outside departments routinely address these problems in this facility. Medical and social work records were reviewed to abstract patient demographic data, reason for patient visit, discharge diagnosis and reason for social work involvement. Descriptive statistical analyses were performed to identify patterns and associations related to social work consultation.

**Summary of Results:** During the study period, 1205 patients received social work consults (1.5% of the ED census for the time period studied). 973 patients were eligible for inclusion. A total of 1049 social work issues were addressed for these patients. The most common reasons for social work consultation in this group were support for families during resuscitations/deaths (48.9%), child protection issues (18.8%) and transportation issues (12.2%). Problems that were uncommonly addressed included substance abuse (1.05%), domestic violence (1.52%) and patients experiencing peer assault (2.47%). Lack of transportation was the most commonly addressed issue in all age groups when family support during resuscitations/deaths and child protection issues were excluded. There was a slight male predominance in this group (54.4% of all patients).

**Conclusions:** The use of social work intervention in this ED is limited to a few supportive indications and may be an underutilized resource. Future directions include an educational intervention for providers regarding opportunities for utilizing social workers and a post intervention analysis of consultation patterns.

## PREVALENCE OF IN-HOSPITAL COMPLICATIONS IN 500 PATIENTS UNDERGOING PERCUTANEOUS CORONARY INTERVENTION TREATED WITH HEPARIN 5000 IU ADMINISTERED SYSTEMICALLY VERSUS IN 500 AGE-MATCHED AND SEX-MATCHED PATIENTS TREATED WITH HEPARIN 70 IU/KG ADMINISTERED SYSTEMICALLY

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**Purpose of Study:** We investigated the prevalence of in-hospital complications in 500 patients undergoing percutaneous coronary intervention (PCI) treated with heparin 5000 IU versus heparin 70 IU/kg administered systemically (group 2) at the time of PCI.

**Methods Used:** The patients in both groups were age and sex matched. Baseline characteristics, indications for PCI, and use of cardiovascular drugs were similar in both groups. Obstructive coronary artery disease was diagnosed if there was greater than 50% obstruction of at least 1 major coronary artery. Chi-square tests were used to analyze dichotomous variables whereas regression analysis was performed to see if any of the differences between the 2 groups were significant.

**Summary of Results:** A Low fixed dose of heparin 5000 IU administered systemically at the time of PCI was associated with a similar low prevalence of in-hospital complications as a low dose of heparin 70 IU/kg administered systemically at the time of PCI.

**Conclusions:** The sample size was adequate to conclude that a fixed low dose of heparin 5000 IU administered systemically at the time of PCI is non-inferior to standard therapy with heparin.

## Cardiovascular drug therapy at time of percutaneous coronary intervention in patients treated with systemic heparin 5000 IU versus systemic heparin 70 IU/kilogram

Drugs	Heparin 5000 IU (n = 500) No. (%)	Heparin 70 IU/kg (n = 500) No. (%)	p Value
Prior thrombolytic therapy	53 (11%)	46(9%)	NS
Aspirin	500(100%)	500(100%)	NS
Clopidogrel	500(100%)	500(100%)	NS
Platelet glycoprotein IIb/IIIa inhibitors	69(14%)	60(12%)	NS
Beta blockers	482(99%)	484(97%)	NS
Statins	494(99%)	490(98%)	NS

NS = not significant

## A PLANAR QRS-T ANGLE $> 90^\circ$ IS ASSOCIATED WITH MULTIVESSEL CORONARY ARTERY DISEASE IN PATIENTS UNDERGOING CORONARY ANGIOGRAPHY

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**Purpose of Study:** To investigate the severity of coronary artery disease (CAD) in patients undergoing coronary angiography who had a planar QRS-T angle  $>90^\circ$  versus  $\leq 90^\circ$ .

**Methods Used:** Coronary angiography was performed in 1229 consecutive patients. Obstructive CAD diagnosed if  $>50\%$  obstruction in at least 1 major vessel. QRS-T angle measured from 12 lead ekg by 2 independent authors blinded to the angiographic findings. A QRS-T angle  $>90^\circ$  was considered to be abnormal.

**Summary of Results:** Obstructive CAD of 2 or 3 vessels was present in 309 of 495 patients (62%) with a planar QRS-T angle  $> 90^\circ$  and in 250 of 734 patients (34%) with a planar QRS-T angle  $\leq 90^\circ$  ( $P < 0.0001$ ).

**Conclusions:** The prevalence of 2 or 3 vessel obstructive CAD was significantly higher in patients with a planar QRS-T angle  $>90^\circ$  than in patients with QRS-T angle  $\leq 90^\circ$  ( $P < 0.0001$ ).

## MORTALITY AT 60 MONTH FOLLOW UP IN 2057 PATIENTS WITH NORMAL, NON-OBSTRUCTIVE AND REVASCULARIZED OBSTRUCTIVE CORONARY ARTERY DISEASE

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**Purpose of Study:** In the CASS registry, VALIANT trial and TIMI trials survival of patients with obstructive coronary artery disease was worse compared to patients with nonobstructive and no coronary artery disease. Present study aims to look at mortality in patients with no CAD v.s non obstructive and 1, 2 and 3 vessel CAD.

**Methods Used:** Coronary Angiography was performed in 2057 unselected patients mean age 69 ± 13 years, 57% men and 43% women. The reason for cardiac catheterization was chest pain. Criterion for obstructive CAD was greater than 50% obstruction of 1 or more major coronary arteries. Patients with obstructive CAD underwent revascularization with CABG or PCI.

**Summary of Results:** Of the 2057 patients, 760 patients had obstructive CAD, 302 patients had 1 vessel CAD, 201 patients had 2 vessel CAD and 257 patients had 3 vessel CAD. 602 patients had normal coronaries and 695 patients had nonobstructive CAD. The mortality was 7% in the no CAD group, 12% in the nonobstructive group, 17% in the 1 vessel CAD, 23% in the 2 vessel CAD and 28% in the 3 vessel CAD group respectively. The *P* value for age was < 0.0001 for no CAD vs nonobstructive CAD and compared to 3 vessel obstructive CAD. The *P* value for gender was < 0.0001 for normal vs 3 vessel obstructive CAD and nonobstructive vs 3 vessel obstructive CAD. Log rank tests were used to compare survival. *P* was < 0.0001 for normal vs 1,2 and 3 vessel CAD and < 0.0001 for nonobstructive vs 3 vessel obstructive CAD. *P* was 0.004 for normal vs non obstructive CAD.

**Conclusions:** At 60 month follow up all cause mortality was higher in patients with obstructive CAD than in patients with nonobstructive CAD or normal coronary arteries (*P* < 0.0001) and mortality was higher in patients with 3 vessel obstructive CAD compared to 1 vessel CAD (*P* = 0.0007).

Mortality was higher in nonobstructive CAD compared to patients with normal coronary arteries (*P* = 0.004).

#### INCIDENCE OF MORTALITY AND APPROPRIATE SHOCKS IN PATIENTS WITH ISCHEMIC AND NON-ISCHEMIC CARDIOMYOPATHY AFTER RECEIVING IMPLANTABLE CARDIOVERTER DEFIBRILLATORS

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**Purpose of Study:** While multiple randomized clinical trials have demonstrated the benefit of implantable cardioverter defibrillator (ICDs) in patients with ischemic cardiomyopathy, there are conflicting data on the role of ICD therapy in patients with non-ischemic cardiomyopathy. The purpose of this study was to compare the clinical outcomes in terms of mortality and appropriate shocks in patients with ischemic and non-ischemic cardiomyopathy after receiving ICDs.

**Methods Used:** In an academic cardiology practice, 894 patients received an ICD according to the American College of Cardiology/ American Heart Association guidelines. The 894 patients included 735 men and 159 women, mean age 71 ± 13 years. At follow-up every 3 months, the ICD was interrogated to see if any shocks occurred. The shocks were further evaluated by an electrophysiologist viewing the intracardiac electrocardiograms to see if they were appropriate. Of the 894 patients, 599 patients (67%) had ischemic cardiomyopathy and 295 patients (33%) had non-ischemic cardiomyopathy. All-cause mortality data were obtained from the Social Security Death Index.

**Summary of Results:** Of the 894 patients who had ICDs, 259 patients (29%) had appropriate ICD shocks during the 31-month follow-up. Appropriate shocks occurred in 181 of 599 patients (30%) with ischemic cardiomyopathy and in 78 of 295 patients (26%) with non-ischemic cardiomyopathy (*p* not significant). Death occurred in 221 of 894 patients (25%). Death occurred in 162 of 599 patients (27%) with ischemic cardiomyopathy and in 59 of 295 patients (20%) with non-ischemic cardiomyopathy (*P* < 0.05).

**Conclusions:** Our results showed that while the prevalence of appropriate shocks were similar in patients with ischemic and non-ischemic cardiomyopathy, patients with ischemic cardiomyopathy had a higher mortality than patients with non-ischemic cardiomyopathy. However, additional research is

required to further identify appropriate patient characteristics for ICD implantation.

#### INCIDENCE OF MORTALITY AND APPROPRIATE SHOCKS IN DIABETIC PATIENTS AFTER RECEIVING IMPLANTABLE CARDIOVERTER -DEFIBRILLATORS

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**Purpose of Study:** Diabetes mellitus is an independent predictor of morbidity and mortality in patients with systolic heart failure. The purpose of this study was to compare the clinical outcomes in terms of mortality and appropriate shocks in patients with versus without diabetes mellitus after receiving ICDs.

**Methods Used:** In an academic cardiology practice, 965 patients received an ICD according to the American College of Cardiology/ American Heart Association guidelines. The 965 patients included 778 men and 187 women, mean age 70 ± 14 years. At follow-up every 3 months, the ICD was interrogated to see if any shocks occurred. The shocks were further evaluated by an electrophysiologist viewing the intracardiac electrocardiograms to see if they were appropriate. Of the 965 patients, 127 patients (13%) had diabetes and 838 patients (87%) did not have diabetes. All-cause mortality data were obtained from the Social Security Death Index.

**Summary of Results:** Of the 965 patients who had ICDs, 282 patients (29%) had appropriate ICD shocks during the 32-month follow-up. Appropriate shocks occurred in 50 of 127 patients (39%) with diabetes and in 232 of 838 patients (28%) without diabetes (*P* < 0.01). Death occurred in 208 of 965 patients (22%). Death occurred in 37 of 127 patients (29%) with diabetes and in 171 of 838 patients (20%) without diabetes (*P* < 0.05).

**Conclusions:** Our results show that patients with diabetes had a higher rate of appropriate shocks and mortality than patients without diabetes. However, additional research is required to further identify appropriate patient characteristics for ICD implantation.

#### PREVALENCE OF TRANSTHORACIC ECHOCARDIOGRAPHIC ABNORMALITIES IN PATIENTS WITH ISCHEMIC STROKE, INTRACEREBRAL HEMORRHAGE AND SUBARACHNOID HEMORRHAGE

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**Purpose of Study:** This study investigated the prevalence of transthoracic echocardiographic abnormalities in patients with ischemic stroke, subarachnoid hemorrhage and intracerebral hemorrhage in sinus rhythm.

**Methods Used:** The patients included 120 with ischemic stroke, 30 with subarachnoid hemorrhage and 41 with intracerebral hemorrhage. All diagnoses were confirmed by magnetic resonance imaging or brain computed tomography. Two dimensional echocardiograms were taken at the time stroke was diagnosed. All echocardiograms were interpreted by an experienced echocardiographer.

**Summary of Results:** Out of 120 Ischemic stroke patients 1(1%) had a left ventricular thrombus, 1(1%) had mitral valve vegetations, 30(25%) had LV hypertrophy, 26(22%) had abnormal LV ejection fraction, 4(3%) had mitral valve prolapse, 33(28%) had mitral annular calcification(MAC), 40(33%) had aortic valve calcification(AVC), 3(3%) had a bioprosthetic aortic valve, 10(8%) had aortic stenosis, 6(5%) had atrial septal aneurysm, 2(2%) had patent foramen ovale and 40(33%) had no abnormalities. Of 30 subarachnoid hemorrhage patients, 5(17%) had LV hypertrophy, 1(3%) had abnormal LV ejection fraction, 1(3%) had Aortic Stenosis, 4(13%) had mitral annular calcification, 5(17%) had aortic valve calcification and 20(67%) had no abnormalities. Of 41 Intracerebral hemorrhage patients 9(22%) had LV hypertrophy, 1(2%) had abnormal LV ejection fraction, 1(3%) had aortic stenosis, 6(15%) had mitral annular calcification, 8(20%) had aortic valve calcification and 22(54%) had no abnormalities.

**Conclusions:** Transthoracic echocardiographic abnormalities are more prevalent in patients with ischemic stroke than in patients with subarachnoid hemorrhage or intracerebral hemorrhage. Further studies are

needed to find correlation of transthoracic echocardiographic abnormalities with occurrence of ischemic stroke and early risk modification for prevention of an ischemic stroke.

### THE INCIDENCE OF CAD AMONG THE RUSSIAN POPULATION LIVING IN BROOKLYN, NEW YORK COMPARED TO OTHER CAUCASIANS LIVING IN THE SAME COMMUNITY

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**Purpose of Study:** CAD is the primary cause of morbidity and mortality in USA. Population registries and epidemiological studies done in the past have shown differences in the incidence of CAD among different ethnic groups. New York is home to about 1.2 million Russians. Objective was to compare the incidence of CAD among the Russian population in regard to the other Caucasian populations living in the same community in Brooklyn New York.

**Methods Used:** A retrospective study done in a community hospital in south Brooklyn over a period of Four years (2001–2005). The patients with chest pain were seen by a cardiologist and according to the risk stratification under went cardiac catheterization.

**Summary of Results:** A total of 2304 underwent coronary angiogram and 1094 (47.5%) had at least one vessel disease. Of the 2304 patients 596 (25.9%) were Russians, 140 (6.1%) were Europeans, 492 (21.4%) were American whites and the rest 1076 (46.7%) non Caucasians. The patients who were included in this study were either born in the USA or have been residing in the USA for the past 5 years. When comparing the three races 285 (47.8%) Russians, 76 (54.3%) Europeans and 276 (56.1%) American whites had CAD. The incidence between the races was not significant. ( $P = 0.07$ ). When comparing the gender of the patient between these races, males had a higher incidence of CAD than the females in all three groups, which was statistically significant ( $P < 0.03$ ). Considering the age of presentation Russians and Europeans presented at an earlier age (40–49 yr) but there was no statistical significance. Risk factors such as hypertension, diabetes, smoking family history of CAD and cholesterol levels showed no statistical significance among the three groups. The Europeans, however, showed a better correlation of CAD with high LDL and low HDL levels than the Russians and the American whites.

**Conclusions:** There is no significant difference in the incidence of CAD among the Russian population when comparing with the rest of the Caucasian population in the same community. We did not find higher incidence of cardiac risk factors within the Russian population when comparing with the rest of the Caucasian population.

### PRIMARY PREVENTION: IS IT EFFECTIVE IN PREVENTING CARDIAC DISEASE AND REDUCING HEALTH CARE COST

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**Purpose of Study:** When considering mortality and morbidity due to preventable diseases cardiovascular disease is the leading cause of death for both men and women in the United States. The initial Guide to Primary Prevention of Cardiovascular Diseases published in 1997 was to aid healthcare professionals and their patients without established coronary artery disease in the prevention of CAD. Has this initiative played a role in reducing mortality and morbidity due to CAD?

**Methods Used:** The data was from New York City Department of Health and Mental Hygiene, Bureau of Epidemiology services. Number of patients treated, financial expenses, average duration of hospital stay due to selected ICD 9 codes for heart diseases and co-morbid factors such as Hypertensive Disease (401.0–405.99), Ischemic Heart Disease (410.0–414.99), Conduction disorders (426), Cardiac dysrhythmias (427) and Heart failure (428), for the years 1996, 2000 and 2004 were included in the study.

**Summary of Results:** In 1996 a total of 110389 patients were treated. In 2000 it was 116284 and in 2004 it was 124489. From 1996 to 2000 there was

an increase of 5.34% patients and from 2000 to 2004 there was an increase of 7.05%. The average stay in 1996 was 8.5 days for females and 7.6 days for males. In 2000 it was 7.4 and 6.7 days respectively and in 2004 it was 6.8 and 6.0 days respectively. 1996 on average 2293.20\$ was spent per day for hospital treatment and a total of 2.03 billion dollars spent on cardiac diseases let alone the financial loss due to the work hours lost. In 2000 average cost per day was 3776.48\$, a rise of 64.68% from 1996 and a total cost of 3.10 billion dollars spent which was 52.70% rise from the year 1996. In 2004 average cost per day was 7000.43\$; a rise of 85.36% from 2000 and 5.59 billion dollars spent on cardiac disease in 2004 a rise of 80.32% from the year 2000.

**Conclusions:** The patient load has increase at a steady rate from 1996 to 2004 and has been greater than the population growth for New York City. The expenditure has also grown steadily and has been higher than the rate of inflation. The average stay has been declining steadily over the past eight years. The primary prevention methods in place to prevent cardiovascular disease and reduce cost of health care seem to have failed in its desired effect.

### INFLUENCE OF DYSLIPIDEMIA ON CORONARY ARTERY DISEASE IN DIFFERENT ETHNIC GROUPS LIVING IN THE SAME COMMUNITY

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**Purpose of Study:** Coronary artery disease (CAD) continues to be the leading cause of death among adults in the USA. Major risk factors are high blood pressure, diabetes, smoking, high total cholesterol (TC), high low density lipoprotein (LDL), low high density lipoprotein (HDL) and high triglycerides (TG) levels.

**Methods Used:** A retrospective study was carried out in a community hospital from 2002–2005 in patients with established CAD to see the association between CAD and the components of fasting lipid profile in different ethnic groups. 1948 patient with CAD were grouped according to ethnic background in to American whites (492), Russians (596), Europeans (76), American born Hispanics (145), non American Hispanics (83), Afro-Americans (88), Non American born Africans (112), Indians (36), Pakistanis (232) and Bangladeshis (88).

**Summary of Results:** In the whole group there was statistical significant correlation with increase total cholesterol levels and CAD, which was seen in all subgroups except for Afro-American ( $P < 0.05$ ). For TG levels and CAD the whole group had a strong correlation, except for the Hispanic sub groups, American whites, Russians and Indians. The whole group and the sub groups showed a similar statistically significant relationship between HDL levels and CAD. There was a strong correlation between LDL levels and CAD for the whole group as well as the sub groups except for American born Hispanic group.

**Conclusions:** HDL was the most significant component associated with CAD that was commonly shared with all ethnic groups. While majority of the ethnic groups had a good correlation with total cholesterol level, LDL levels and CAD but for TG the association was less clear cut. Further prospective studies should be done to see if general guidelines for treatment of hyperlipidemia can be used for all ethnic groups in order to prevent CAD.

### PREVALENCE OF COMPLICATIONS DURING IMPLANTATION AND DURING 38-MONTHS FOLLOW-UP OF 1,060 CONSECUTIVE PATIENTS WITH IMPLANTABLE CARDIOVERTER-DEFIBRILLATORS

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**Purpose of Study:** The purpose of this project is to perform the largest single center study that evaluates the prevalence of complications that occurred during hospitalization for implantation of implantable cardioverter-defibrillators (ICDs) and during long-term follow-up. We previously reported that appropriate shocks occurred in 329 of 1,038 consecutive patients (32%) with ICDs during a 33-month follow-up.

**Methods Used:** In an academic cardiology practice, 1,060 consecutive patients received an ICD implanted by two experienced cardiologists according to the American College of Cardiology/ American Heart Association

guidelines. The 1,060 patients included 847 men and 213 women, mean age 70 ± 14 years. The prevalence of complications was investigated during implantation and during follow-up. Mean follow-up was 38 ± 33 months.

**Summary of Results:** Complications occurred in 60 of 1,060 patients (5.7%). These complications consisted of fractured leads requiring lead revision in 36 patients (3.4%), lead infection requiring antibiotics in 5 patients (0.5%), device replacement because of malfunction in 5 patients (0.5%), repositioning of leads in 3 patients (0.3%), a hematoma at the time of implantation in 3 patients (0.3%), pneumothorax at the time of implantation in 2 patients (0.2%), repair of a defective generator in 1 patient (0.1%), replacement of the device because of atrophy of the skin over the device in 1 patient (0.1%), a transient ischemic attack because of atrial fibrillation developing during implantation in 1 patient (0.1%), device replacement because of a recall from Guidant II in 1 patient (0.1%), pocket revision because of pain when lying on the side of the pacemaker in 1 patient (0.1%), and pacemaker infection in 1 patient (0.1%).

**Conclusions:** Since 32% of these patients had appropriate ICD shocks, the complication rate during implantation.

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#### TOWARD A BEST PRACTICE METHOD OF USING ANCESTRY INFORMATIVE MARKERS TO DISTINGUISH POPULATIONS

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**Purpose of Study:** The inconsistency and ambiguity of racial/ethnic category variables has been highlighted by numerous scholars of various backgrounds. Yet, to date, clinical research studies continue to link race

and various biological traits such as drug responses. Ancestry informative markers provide a potentially viable alternative to racial/ethnic categories. These markers are usually SNPs which are more frequent in certain geographically defined groups of individuals. These SNPs are often used as a way of controlling population stratification; however they also offer a unique way of categorizing populations consistently, without the ambiguity of socially determined race/ethnic categories.

**Methods Used:** A literature review was conducted in order to develop a best practice approach to stratifying populations with ancestry informative markers in clinical studies. Using the search term ancestry informative marker, 200 articles were recovered from the SCOPUS database. These articles were reviewed in order to determine which focused on humans and utilized ancestry informative markers. After a detailed review of the remaining studies, 40 unique panels of ancestry informative markers were found. Two criteria were used to select the best panel of markers: the informativeness of the markers and the availability of a TAQMAN assay for the marker, key criteria used throughout the literature. Also, markers were selected which represented a range of geographic regions.

**Summary of Results:** From the panels of markers reviewed, a panel of 11 markers were developed which could be used as a best practice approach for distinguishing populations in clinical research studies with ancestry informative markers.

**Conclusions:** A panel of 11 ancestry informative markers was constructed from a detailed literature review of existing papers which incorporate ancestry informative markers into clinical research studies. This panel provides a best practice approach for assessing differences among populations instead of using racial/ethnic categories. A future study will be conducted to apply this method to cohort of patients with asthma in order to assess if the method creates unique risks groups for asthma gene-environment interactions.