

trolled trials (RCTs) evaluating Dabigatran for the treatment of AF. We included studies that were: (1) a RCT in humans; (2) an investigation of patients with nonvalvular atrial fibrillation; (3) an evaluation of dabigatran compared with warfarin or each other; and (4) a report of results of stroke or systemic emboli and major bleeding. A systematic literature search for dabigatran trials was undertaken for the databases Pubmed, Embase, Biosis, Google Scholar, and Cochrane. Data was collected for the study size, interventions, year and total bleeding events. For meta-analysis, random effects and fixed effects models were used to obtain cumulative statistics. **RESULTS:** Two RCTs with a total of 12,268 patients were identified. The pooled event rate for Dabigatran for total bleeding events was 31.9% (95% CI 31%-33%). The pooled response rate for Warfarin for total bleeding events was 35.1% (95% CI 34%-37%). The cumulative relative risk for total bleeding events with Dabigatran versus Warfarin was 0.91 (95% CI 0.89-0.93). **CONCLUSIONS:** Meta-analysis shows Dabigatran has a slightly lower rate of total bleeding events compared to Warfarin.

#### PCV23

##### COST AND OUTCOMES OF ANTIHYPERTENSIVE TREATMENTS IN ASIAN INDIAN PATIENTS

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**OBJECTIVES:** The objective of the study was to determine costs and clinical outcomes of antihypertensive treatment patients taking amlodipine or telmisartan. **METHODS:** This year long prospective observational study was carried out at cardiology OPD of a private tertiary health care hospital. The patients over 20 years of age, either sex, with clinically diagnosed hypertension (JNC VII) receiving either telmisartan (40 & 80 mg OD) or amlodipine (5 mg OD or BD) were followed for a period of at least 8 weeks after baseline assessment. An attempt made to understand the direct costs involved. The primary outcome measured was difference in SBP and DBP after 8 weeks of treatment vs. baseline BP. Only the direct costs were included. **RESULTS:** Of 250 patients studied, 120 belonged to the amlodipine and 130 to the telmisartan group. 150 had a family history of hypertension. The average systolic and diastolic BP was 153.90±15.7 and 93.36±7.1 mmHg, respectively. Age, weight, height, BMI, Baseline SBP and DBP and duration of hypertension did not differ in between amlodipine and telmisartan group. The prevalence of CAD was more in male patients; and, the prevalence of diabetes was more in female patients. The average reduction in SBP was amlodipine and telmisartan group was 17.92±10.2mmHg and 18.48±13.6 mmHg. The average DBP reduction found in amlodipine and telmisartan group were 9.45±7.3 and 10.3±6.9 mmHg. However, at the end of the minimal follow up period, there was no statistically significant difference found in reduction of DBP. BP control was significantly different in diabetic and non-diabetic patients. The average cost of drugs per mmHg reduction of BP was INR973 and INR812 in amlodipine and telmisartan arms, respectively, in non-diabetic hypertensive patients on monotherapy. **CONCLUSIONS:** Despite its limitations, the results offer indicative evidence using the real-time Asian Indian patients.

#### PCV25

##### EVALUATION OF ADHERENCE TO TREATMENT GUIDELINES AND RE-HOSPITALIZATION IN PATIENTS WITH CHRONIC HEART FAILURE: THAILAND

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**OBJECTIVES:** Current guidelines recommend a combination of ACEIs/ARBs, beta-blockers and aldosterone antagonists for the treatment of chronic heart disease; however, previous studies have found minimal use of these medications. This study aimed to evaluate the physicians' adherence to treatment guidelines and to explore the association between adherence to guidelines and re-hospitalization in patients with chronic heart failure in Thailand. **METHODS:** This retrospective cohort study collected data from systolic heart failure patients who received treatment from a tertiary university-affiliated hospital between January 2008 and December 2010 and were followed-up for 2 years. The evaluation of the physicians' adherence to treatment guidelines in prescribing ACEIs/ARBs, beta-blockers and aldosterone antagonists (primary endpoint) were conducted by using a Guideline Adherence Indicator (GAI-3; classified as low, medium and high) according to the recommendation of guidelines. The secondary endpoint was re-hospitalization for CHF during the follow-up period. **RESULTS:** Of 155 patients, more patients were prescribed beta-blockers (65.8%) than ACEIs/ARBs (50.7%) and aldosterone antagonists (20.0%). Twenty-five, 47 and 28 percent of patients were classified as low, medium and high GAI-3, respectively. The rate of re-hospitalization was lower in patients with a high GAI-3 score compared to patients with a medium or low GAI-3 score (79.1 vs. 90.4 vs. 94.9, per 100 person-years, respectively). Multivariable Cox regression analysis (adjusted by sex, age, NYHA Functional Class and comorbidity) found that patients with high and medium GAI-3 scores had a lower risk of re-hospitalization compared with low GAI-3 score (high GAI-3 score: adjusted HR 0.184, 95%CI:0.093-0.367, p<0.001; medium GAI-3 score: adjusted HR 0.436, 95%CI:0.238-0.797, p=0.007). **CONCLUSIONS:** Physicians' adherence to treatment guidelines for systolic heart failure was not optimal. Some patients did not receive medications following the guidelines' recommendation. Our results suggested that using medications following treatment guidelines was an important factor to reduce the risk of re-hospitalization from heart failure.

#### PCV26

##### THE USE OF PILLBOX AND TIME IN THERAPEUTIC RANGE AMONG NEW USERS OF WARFARIN: A PROSPECTIVE COHORT STUDY

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**OBJECTIVES:** Warfarin, a widely prescribed oral anticoagulant, is well known to have a narrow therapeutic index. Many studies confirmed that adherence helps to achieve a stabilization of the INR, but little data is available on the impact of the use of a pillbox. The objective of this study is to evaluate the association between the use of a pillbox among new warfarin-users and time in therapeutic range (TTR). **METHODS:** This study was based on a prospective cohort of new warfarin-users which aims to assess the genetic, clinical and environmental risk factors associated with the effectiveness and safety of warfarin. Demographic and clinical data were collected among a subgroup of 702 patients who began the treatment between May 1st, 2010 and Aug. 31st, 2012 at one of 18 hospitals in Quebec, Canada. Patients were followed-up each three months up to a year after the initiation of warfarin. Our outcome was the TTR and it was tested using a mixed linear model to allow for repeated measures. **RESULTS:** Mean age was 70.0 ± 11.6, 60.1% were men, 79% had atrial fibrillation as a primary indication for warfarin, 67.9% had hypertension and 61.1% had dyslipidemia. Of these patients, 47.2%, 53.1%, 56.1% and 60.4% used a pillbox at 3, 6, 9 and 12 months, respectively. Patients who used their own pillbox (approximately 75% of pillbox users) had a higher TTR than non-users (3.7%, p=0.03). These results were adjusted for the INR target, age, number of concomitant drugs and patient-reported dose of warfarin as these covariates were significantly associated with the outcome. **CONCLUSIONS:** There is a significant association between the use of a pillbox prepared by the patient and a higher TTR. The use of this device may improve the stability of patients taking warfarin, but the clinical significance of this finding is arguable.

#### PCV27

##### USE OF DIURETICS IN SERBIA FROM 2008 TO 2012

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**OBJECTIVES:** Diuretics are drugs of first choice in the treatment of hypertension. The aim of this study was to analyze the consumption of diuretics in Serbia in the period from 2008 to 2012 year. **METHODS:** The data about the use of drugs were taken from the Agency for Drugs and Medical Devices of the Serbia. **RESULTS:** The use of diuretics during the observed period in Serbia is quite small and it ranged from 5 to 6% of the total consumption of all drugs from the C group. Furosemide was the most frequently used diuretic from 2008-2010. In the observed period consumption of furosemide ranged about 61% of the total consumption of all diuretics. On the second place in consumption during first three years of the study was indapamide. Indapamid records decline in consumption in next two years. In 2011, and 2012, hydrochlorothiazide takes second place in consumption and marks a positive trend. In 2012, it ranged 7.92 DDD/1000 inh/day. Spironolactone takes the fourth position in the first three years. During the 2011, and 2012, consumption of spironolactone has increased and took the third position in consumption. Consumption of all other diuretics was small. **CONCLUSIONS:** In Serbia, in the observed period, consumption of diuretics were uneven. It is two to three times lower in comparison with the consumption of diuretics in Norway and Finland. This research was supported by Provincial Secretariat for Science and Technological Development, Autonomous Province of Vojvodina project No 114-451-2458/2011 and by Ministry of Science, Republic of Serbia, project no 41012.

#### PCV28

##### BURDEN OF MAJOR ADVERSE CARDIAC EVENTS (MACE) IN PATIENTS WITH CORONARY ARTERY DISEASE (CAD) OR PERIPHERAL ARTERIAL DISEASE (PAD)

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**OBJECTIVES:** Patients with a history of a cardiovascular (CV) disease are at high risk of developing secondary major adverse cardiac events (MACE), including death, non-fatal myocardial infarction (MI), stroke, symptomatic pulmonary embolism, CV and all-cause hospitalization, and bleeding. The objective is to review the epidemiology and burden of MACE in patients with coronary artery disease (CAD) or peripheral arterial disease (PAD) in Europe, Asia, Latin America and Canada. **METHODS:** A comprehensive search was conducted in PubMed, EMBASE, Cochrane and other relevant sites. 460 full-text articles, published between 2003 and 2013, were reviewed. **RESULTS:** MACE was more prevalent in CAD/PAD patients compared to matched controls (> 2-fold higher). Proportions of CAD patients who have had MI, stroke, or bleeding were 1.4%-3.0%, 1.24% and 0.81%, respectively. For PAD patients, these proportions were 1.37%-13.7%, 0.4%-5.2%, and 1.3%, respectively. Compared to individuals with no CV disease, MACE incidence in CAD or PAD patients was increased by at least two-fold, ranging from 18.1%-32.3% for all-cause death, 12.1%-18.9% for CV death, 8.2%-17.3% for MI and 6.8%-11.3% for stroke. In patients with CAD, evidence of MACE was reported within 30 days of primary percutaneous coronary intervention and incidence increased over time. The main risk factors for MACE in CAD/PAD patients included increased oxidative stress in coronary and peripheral arteries, diabetes, and chronic kidney disease. Limited information was found on the economic and humanistic burden of MACE in CAD/PAD patients. Available data showed that MACE occurrence increased hospitalization rates and associated costs, in addition to worsening patients' quality of life. **CONCLUSIONS:** Although gaps in the literature were identified, this assessment showed that the risk of MACE is substantial among CAD/PAD patients and imposes a considerable burden. Development of preventive measures is warranted.

#### PCV29

##### RATES OF ACUTE CORONARY EVENTS AND ALL CAUSE MORTALITY IN PATIENTS WITH STABLE CORONARY ARTERY DISEASE (CAD) AFTER MYOCARDIAL INFARCTION AND ADDITIONAL CARDIOVASCULAR RISK FACTORS

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**BACKGROUND:** The rates of cardiovascular (CV) events are highest in the period immediately after an initial MI but may remain elevated for an extended period of time. **OBJECTIVES:** Evaluate long-term rates of CV events (recurrent myocardial infarction (MI) and hospitalized stroke) and all cause mortality in patients with stable CAD after MI and in patients resembling those of the PEGASUS trial (NCT 01225562). **METHODS:** Patients  $\geq 50$  years old (yo) with an MI followed by  $\geq 12$  MI-free months (stable CAD) and no prior stroke were identified from a large claims database between 01/2007 and 11/2011. Inclusion and exclusion criteria were identified during a 12 month pre-MI baseline. Patients included in the PEGASUS-like cohort were those having at least one additional risk factor ( $\geq 1$  additional prior MI, Age  $\geq 65$ , diabetes or chronic non-end-stage renal disease (NESRD)). Rates of a composite endpoint (MI or stroke hospitalization or all-cause mortality) in the stable CAD and PEGASUS-like populations were estimated during follow-up (up to four years) after the stable CAD index. Due to data and population limitations, rates were compared in patients  $< 65$  yo only. **RESULTS:** In the  $< 65$  yo PEGASUS-like cohort, 24.4% had  $\geq 1$  additional prior MI, 76.1% had diabetes, and 27.4% had NESRD. Event rates for the PEGASUS-like ( $n = 5,357$ ) and other stable CAD cohorts ( $n = 8,135$ ) were 60/1,000 and 27/1,000 person-years (py), respectively ( $p < 0.0001$ ). Hospitalized MI was the largest contributor to the composite endpoint (38/1,000 and 19/1,000 py, respectively,  $p < 0.0001$ ). Composite event rates in PEGASUS-like patients who were still MI-free 2 and 3 years after the index MI were 51/1,000 py and 44/1000 py, respectively. **CONCLUSIONS:** Stable CAD patients in the US meeting PEGASUS clinical trial criteria continue to have an elevated risk of major CV events and all cause mortality after several MI-free years.

### PCV30

#### TRICYCLIC ANTIDEPRESSANTS USE AND RISK OF MYOCARDIAL INFARCTION: A SYSTEMATIC REVIEW AND META-ANALYSIS OF OBSERVATIONAL STUDIES

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**OBJECTIVES:** Several studies establish that the use of antidepressants associated with an increased risk of myocardial infarction (MI). However, available evidence on tricyclic antidepressants (TCAs) is conflicting. We therefore examined the association between TCAs use and risk of MI by conducting a detailed systematic review and meta-analysis using all observational studies published regarding this subject. **METHODS:** A PubMed/MEDLINE search was conducted for studies published up to 31<sup>st</sup> December, 2013. The studies were first evaluated for publication bias and heterogeneity. Pooled relative risk (RR) estimates and 95% confidence intervals (CIs) were calculated using random-effects model if heterogeneity presents or otherwise fixed-effects model. Cumulative meta-analysis, subgroup and sensitivity analyses were also performed. **RESULTS:** Six (3 cohort and 3 case-control) studies satisfying the inclusion criteria were considered for this study. There was heterogeneity among the studies ( $p_{\text{heterogeneity}} < 0.001$ ,  $I^2 = 98\%$ ) but no publication bias (Begg's  $p = 0.70$  and Egger's  $p = 0.45$ ). We observed no association between TCAs use and risk of MI (RR 1.14, 95% CI 0.67-1.96,  $p = 0.622$ ). But, the sensitivity analysis revealed that the TCAs users are having 36% increased risk of MI after excluding one outlier (RR 1.36, 95% CI 1.10-1.67,  $p < 0.001$ ) with less heterogeneity ( $p_{\text{heterogeneity}} = 0.001$ ,  $I^2 = 78\%$ ). Subgroup analysis by study design shows that case-control studies are having positive association (RR 1.41, 95% CI 1.37-1.45,  $p < 0.001$ ) but, cohort studies having no association (RR 0.94, 95% CI 0.40-2.23,  $p = 0.893$ ) because of an outlier cohort study. Further, cumulative meta-analysis showed a change in trend of reporting MI risk from positive to no association in TCAs users between 1996 and 2011. **CONCLUSIONS:** We found evidence that the use of TCAs was associated with elevated risk of MI. Further research is needed to identify the underlying biological mechanisms.

### PCV31

#### ANTICOAGULANT USE AND BLEEDING RISK IN PATIENTS WITH VENOUS THROMBOEMBOLISM: A NESTED CASE-CONTROL STUDY

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**OBJECTIVES:** To examine anticoagulant use and bleeding risk in patients with venous thromboembolism (VTE) in the U.S. clinical practice setting. **METHODS:** Adult patients with VTE were selected from the MarketScan Commercial and Medicare Supplemental Databases between 07/01/2006 and 12/31/2011. Patients were required to have at least two outpatient visits with VTE diagnosis within 3 weeks of each other or one inpatient VTE diagnosis. Patients were also required to have at least 6 months continuous enrollment in the 6 months prior to first VTE diagnosis. Cases consisted of VTE patients who experienced a major bleeding event after VTE diagnosis. Control patients were those who did not experience any bleed after VTE diagnosis and were 1:1 matched with cases by propensity score. Anticoagulant use was categorized as current use (within 2 weeks prior to bleeding), past use (more than 2 weeks prior to bleeding), and never used prior to bleeding or during follow-up period. Multivariate logistic regression was performed to examine the association between anticoagulant use and major bleeding. **RESULTS:** A total of 4166 bleeding cases and matched controls were included in the analysis. Compared to controls, cases were more likely to currently use anticoagulants (25.6% vs. 16.7%,  $p < .0001$ ). Multivariate logistic regression showed that use of warfarin (past: OR=1.25; current: OR=1.48), parenteral anticoagulant (past: OR=1.91; current: OR=4.59), and parenteral anticoagulant plus warfarin (past: OR=1.36; current: OR=1.87) were significantly associated with increased risk for major bleeding ( $p < 0.001$ ), after adjusting for demographic and clinical factors. Results were similar with sensitivity analysis using 1:1 hard matched data on age, sex, type of VTE, and index VTE diagnosis date. **CONCLUSIONS:** In patients with VTE, current and past use of anticoagulants was associated with increased risk of major bleeding. Study results suggest more effective anticoagulants demonstrating lower bleeding risk are needed to treat and prevent recurrence of VTE.

### PCV32

#### RISK OF SERIOUS CARDIOVASCULAR ADVERSE EVENTS WITH THE USE OF DRONEDARONE: A META-ANALYSIS STUDY

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**OBJECTIVES:** Dronedarone is a non-iodinated benzofuran derivative approved by FDA in July 2009. It is used for the treatment of abnormal heart rhythm in patients with a history of atrial fibrillation or atrial flutter. The recent evidence suggests there is a potential risk of serious cardiovascular adverse events associated with the use of dronedarone, especially among patients with permanent atrial fibrillation. The objective is to assess the association between use of dronedarone and the risk of serious cardiovascular adverse events and other health outcomes. **METHODS:** A literature search of peer-reviewed publications relevant to the study was performed using PubMed® from 1996 to 2013. Eight clinical trials with a total of 10,800 patients enrolled were identified for this study. A meta-analysis of randomized controlled trials comparing patients with or without dronedarone was conducted. The dronedarone group included patients who took dronedarone, and patients who took placebo (7 studies) or amiodarone (1 study) were considered as the control group. Outcomes included all-cause mortality, cardiovascular mortality and heart failure exacerbation. Review Manager 5.2 was used for data analysis. **RESULTS:** Compared to the control group, the use of dronedarone did not significantly increase the risks of all-cause mortality (Risk Ratio [RR], 1.27; 95% Confidence interval [CI], 0.80 to 2.02), cardiovascular mortality (RR, 1.31; 95% CI, 0.53 to 3.24) and heart failure exacerbations (RR, 1.19; 95% CI, 0.88 to 1.62). However, after conducting the sensitivity analysis which excluded the ATHENA study (the FDA approval of dronedarone was based on this trial), we found dronedarone was statistically significant in increasing the risk of all-cause mortality (RR, 1.70; CI, 1.13 to 2.56), cardiovascular mortality (RR, 2.13; 95% CI, 1.10 to 4.15) and heart failure exacerbations (RR, 1.42; 95% CI, 1.07 to 1.89). **CONCLUSIONS:** The health care professionals should prescribe dronedarone cautiously for patients with cardiovascular risk factors.

### CARDIOVASCULAR DISORDERS – Cost Studies

#### PCV33

##### THE ECONOMIC IMPACT OF IMPLEMENTING A MULTIPLE INFLAMMATORY BIOMARKER-BASED APPROACH TO IDENTIFY, TREAT, AND REDUCE CARDIOVASCULAR RISK

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**OBJECTIVES:** To develop a model for estimating reductions in the number of events and costs of myocardial infarction (MI) and ischemic stroke (IS) for a US health plan as a result of implementing routine testing with multi-tiered cardiovascular risk markers of vascular inflammation including hsCRP, Lp-PLA2 and myeloperoxidase. **METHODS:** An Excel model was developed to estimate reductions in MI and IS as well as reductions in the per-member-per-month (PMPM) and five-year costs before testing costs due to biomarker-based testing for a hypothetical US health plan. Inputs for the model included: incidence rates of MI and IS, direct costs associated with MI and IS, lab results of multi-marker testing, graded risk ratios of MI and IS based on combinations of abnormal risk markers, patient monitoring and intervention costs, and preventative pharmacotherapy. Preventative pharmacotherapy use and costs were based on an analysis of pharmacy claims data. Costs savings (2012 USD) were assessed for patients undergoing multi-marker testing as compared to patients with lipid panel testing only. Clinical expertise was relied upon for inputs relating to treatment response and changes in preventative pharmacotherapy. Direct costs, incidence rates, and risk ratios were obtained from literature. **RESULTS:** For a health plan with 1,000,000 members, an estimated 21,104 MI and 22,589 IS events would occur over five years. Implementing this multi-tiered risk assessment of inflammatory biomarkers for patients  $\geq 35$  years old would reduce MI and IS events by 2,018 and 1,848, respectively, yielding almost \$180.6m in cost savings (\$3.01 PMPM). Results were sensitive to changes in treatment response. Nonetheless, cost savings were observed for most scenarios. **CONCLUSIONS:** This study suggests that health plans can realize substantial cost savings by preventing MI and IS events after implementing routine biomarker testing. Cost savings before testing costs could reach more than \$3.01 PMPM for a typical US health plan.

#### PCV34

##### ESTIMATING THE IMPACT OF COMBINING CANGRELOR AND BIVALIRUDIN TO A UNITED STATES HOSPITAL PERFORMING PCI PROCEDURES

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**OBJECTIVES:** Percutaneous Coronary Intervention (PCI) is used to treat Acute Coronary Syndrome (ACS). Currently ACCF/AHA/SCAI PCI guidelines recommend use of antithrombin agents (bivalirudin or heparin) in combination with antiplatelet agents (oral P2Y12 inhibitors and/or GPIIb/IIIa inhibitors). Bivalirudin has demonstrated reduced bleeding events vs. heparin+GPI; though, GPI use has declined over the past 10 years. Cangrelor, a novel, rapid on/off-set IV P2Y12, reduced ischemic events vs. clopidogrel in the CHAMPION program. The aim of our analysis was to quantify the impact of using cangrelor and bivalirudin together in PCI from a US hospital perspective. **METHODS:** A decision analytic model based on current clinical practice was developed to estimate the annual impact of using heparin+/-GPI+/-clopidogrel (base case) vs. bivalirudin+cangrelor+/-bailout GPI (scenario). We used data from RCTs to estimate event rates (mortality, myocardial infarction, stent thrombosis, ischemia-driven revascularization, and major/minor bleeding). Patient and GPI mix was derived from an analysis of Premier's Perspectives Database. GPI use in cangrelor patients was based on the CHAMPION Phoenix study. Event costs were obtained from published literature and inflation-adjusted to 2013 dollars. Drug costs were based on 2013 wholesale acquisition costs. To estimate the clinical value of using bivalirudin+cangrelor, we set their costs to \$0. **RESULTS:** For a hypo-