increased to 42.6% by 2005. In 2000, 89.5% of all AMI patients was treated with thrombolysis as primary intervention, 7.8% underwent PCI, and 2.6% CABG; by 2005 these percentages changed to 21.1%, 73.1%, and 5.8% respectively. We compared the 30-day and one year mortality by intervention groups. In 2005 without any intervention it was 27.5% vs 37.8% (30 days and 1 year), in the PCI group 6.1% vs 9.7%, in the thrombolysis group 14.8% vs 18.7% and in the CABG group 6.4% vs 12.3%. The 30-day mortality is independent of gender but depends on age. The chance of 30-day survival decreases due to diabetes and cancer (OR: 0.885 and 0.60, respectively), shock (OR: 0.06) and resuscitation (OR: 0.07). Survival is significantly better in case of hypertension (OR: 1.4). **CONCLUSION:** Administrative data proved to be appropriate tools to develop quality indicators, thus its results can be very useful in improving health care.

PCV13
RISK OF MAJOR BLEEDING DURING CONCOMITANT USE OF ANTIBIOTIC DRUGS AND COUMARIN ANTICOAGULANTS

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OBJECTIVES: To quantify and qualify the risk of major bleeding associated with the use of antibiotic drugs during coumarin anticoagulant therapy in daily practice. **METHODS:** Data for this retrospective cohort study were obtained from the PHARMO Record Linkage System, including, among others, linked drug-dispensing records and hospital records for over three million individuals in defined areas of The Netherlands. The study cohort included all users of acenocoumarol or phenprocoumon, aged 40–80 years, for the period 1996–2004. All patients were followed until the end of their last coumarin dispensing, hospitalisation for bleeding, death, or end of study period. Number of days on coumarins alone, and number of days on coumarins in combination with each antibiotic drug during follow-up, were determined for each patient. We analysed antibiotic drugs for which at least five patients experienced a bleeding at least two weeks after anticoagulant therapy commenced, and which fell within the risk period of a single antibiotic drug. **RESULTS:** Respectively, 52,102 acenocoumarol and 7,885 phenprocoumon users met the inclusion criteria for the study cohort and contributed 139,159 patient-years of follow-up. During follow-up 838 patients (1.4%) were hospitalised for bleeding while taking coumarins. The antibiotic drugs for which at least five coumarin users had a bleeding were doxycycline, amoxicillin, amoxicillin/clavulanic acid, ciprofloxacin and cotrimoxazole. Each of these antibiotic drugs was associated with an increased risk of bleeding. Incidence rates ranged from 5.2 major bleedings per 10,000 doxycycline-dispensings to 11.2 major bleedings per 10,000 cotrimoxazole-dispensings during coumarin use. Corresponding relative risks for major bleeding, adjusted for gender and age, ranged from 2.6 (95% CI 1.4–4.8) for doxycycline to 5.3 (95% CI 2.4–11.8) for cotrimoxazole. **CONCLUSION:** Doxycycline, amoxicillin, amoxicillin/clavulanic acid, ciprofloxacin and cotrimoxazole are the main antibiotic drugs associated with an increased risk of major bleeding during coumarin anticoagulant therapy in daily practice.

PCV14
CHARACTERIZATION, RISK FACTORS, CLINICAL OUTCOMES, AND ECONOMIC CONSEQUENCES OF BLEEDING ASSOCIATED WITH CARDIAC SURGERY: A SYSTEMATIC LITERATURE REVIEW

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OBJECTIVES: To characterize epidemiological risk factors, review clinical outcomes, and overall costs associated with treating bleeding related to cardiac surgery, and identify areas for further research. **METHODS:** A systematic literature search was performed (1996-March 2007) using terms designed to identify publications describing epidemiology and associated risk factors, clinical outcomes, and economic impact of bleeding in cardiac surgery patients. Studies were identified through electronic Medline® and PubMed® searches. Manual review of bibliographies within these papers allowed identification of additional articles. **RESULTS:** A total of 36 (epidemiology: n = 13, clinical outcomes: n = 14, and economic burden: n = 9) papers [manual search: n = 12] were included for review. Incidence of bleeding associated with major cardiac surgical procedures varied widely, ranging from 0.4%–19.0%, partly attributable to the types of cardiac operations as well as to differences in the definition of bleeding. Pre-operative smaller body mass index, use of antithrombotic drugs, nonelective surgery, increased age, and redo procedures were associated with bleeding, while embolic events were found to be major complications. Costs associated with bleeding requiring transfusion ranged from $397 (blood products only) to $10,225 per patient (all treatment costs), with hospital LOS as the major cost contributor. Mean cost of open-heart surgeries [including coronary artery bypass graft (CABG) and valve replacements] range from $25,057 to $79,795, with patients undergoing CABG found to have an incremental cost of $3,866 associated with bleeding. Primary pharmacological treatments for bleeding among cardiac surgery patients included antifibrinolytics and procoagulants. **CONCLUSION:** Post-operative bleeding remains a central clinical outcome in cardiac surgery with significant economic impact despite improvements in perioperative bleeding management. Sufficient information on recent cost estimates as well as differences in bleeding costs associated with various cardiac procedures is lacking. Further research investigating the economic consequences of bleeding associated with cardiac surgery is warranted.

CARDIOVASCULAR DISEASE—Cost Studies

PCV15
IMPACT OF CHANGES IN REIMBURSEMENT SYSTEM ON THE BUDGET FROM THE PAYER'S AND PATIENT'S PERSPECTIVE

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OBJECTIVES: Introduction. The polish system of medication reimbursement is based on positive list. The government decides which medication could be reimbursed by adding or removing it from the list. Additional tool for reimbursement control is the "medication refund limit" (MRL). The same MRL per DDD is set for each INN separately or for group of medication, which have the same indication, form and dose. The payer (National Fund of Health) partially refunds the cost of medication below the MRL. The difference between the MRL and price is paid by patient. In 2006 the government changed the MRL and official prices for some medication. The aim is to assess the impact of

changes in MRL on payer's and patient's one year budget on the example of angiotensin II blockers. **METHODS:** The three models were build to assess the changes in payer's and patient's budget/per patient if therapy is conducted using: 1) the only original medications;2) only generic medications; or 3) if therapy had been started with original medications and changed to the generic (after changes on the list). All costs in polish zloty (zł): 1 euro ~ 3.80 zl. **RESULTS:** In all models (from 1 to 3) the payer's payment will decrease from 281 zł to 154 zł pe patient. From the patient's perspective the one year payment will rise from 767 zł to 1048 zł or from 449 zł to 577 zł—depends on medication (in model 1) and from 281 zł to 409 zł (in model 2), only in model 3 it will decrease from 767 zł to 409 zł. **CONCLUSION:** The changes in MRL may lead to reduction of payer's expenditures and usually increase the patient's expenditures. As a result it could leads to reduction in patient's access to medications.

HEALTH INSURANCE COSTS OF STROKE HOSPITAL TREATMENTS IN HUNGARY; 2003–2005

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OBJECTIVES: Our aim was to assess the social insurance costs of hospital treatments for acute stroke in Hungary between 2003 and 2005. We studied how much burden stroke patients impose on the financer (National Health Insurer Fund Administration) in acute and chronic hospital admissions. **METHODS:** We extracted the data of 'new' stroke patients (ICD-10: I60–64 diagnosis) hospitalized in May 2003 from the database of the financer. We analyzed active and chronic hospital treatment costs of these patients in the period of 12 months before the stroke and in the following first and second 12 months. Data were distributed by sex and age (age groups: 25–44, 45–64, over 65). We studied patients hospitalized in May 2003 with the ICD-10: I60–64 main diagnosis but not treated with the same diagnosis in the previous 24 months. **RESULTS:** In the first 12 months of the active care the burden of the disease was (male vs. female) 65+: 1018.4 vs. 823.2; 45–64: 1365.6 vs. 1122.0; 25–44: 1480.4 vs. 1224.4 Euro per patient. In the second 12 months the costs were 202.4 vs. 144.8; 96.8 vs. 130.4; 110.4 vs. 99.2 Euro respectively. **CONCLUSION:** Annual stroke costs of the Insurance Fund—based on our incidence data (3535 patients/month)—amounted to 37.6 million Euros in active and to 4.3 million Euros in chronic hospital care in the first 12 months, which is 1.68% of the total budget. Average costs of stroke are higher in the case of males as are in the case of females, 1459.2 vs. 1212.0 Euro in the first 24 months. The significant difference results from active hospital treatment costs (1326.0 vs. 1048.4 Euro), while the discrepancy is smaller in chronic hospital care (133.2 vs. 163.6 Euro).

METABOLIC CONTROL AND COSTS OF PATIENTS WITH HIGH CARDIOVASCULAR RISK; A CROSS SECTIONAL ASSESSMENT OF A HEALTH MANAGEMENT ORGANIZATION DATABASE

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OBJECTIVES: Estimate the budget impact and the level of therapeutic goal attainment among patients with high cardiovascular

risk (HCR) in a population attending primary care setting (PCS) and Hospital centres (HC) in a Spanish area. **METHODS:** Observational multicentre longitudinal study. Patients >55 years old from seven PCC and two HC were recruited during 2006. Definition of HCR as per modified NCEP-ATP III criteria. The control cohort: patients without HCR. Main measures: cardiovascular/general comorbidities, Charlson score (severity [iCh]), clinical parameters (DP, SP, glucose, cholesterol, HCLc, LDLc) and total costs variable/semi fixed (visits, tests, drugs, admissions, derivations, emergencies etc). A logistic regression and covariance model was developed (ANCOVA-Bonferroni) to correct the models (comorbidities-cost). SPSS program was used. Level of significance was $p < 0.05$. **RESULTS:** In all, 24,410 patient were studied, 15.4% (n = 2.766; IC:14,9–15,9%; p = 0,000) had HCR, mean age: 68,2 ± 9,5 years, women: 55,2%. HCR was associated with: men (OR = 2,7; IC:2,5–3,0), dyslipidemia (OR = 1,5; IC:1,4–1,6), hypertension (OR = 1,2; IC:1,1–1,3), diabetes (OR = 1,1; IC:1,0–1,2) and iCh (OR = 2,1; IC:1,9–2,2), p < 0,0001. Differences for the group with and without HCR were: Metabolic control: DP: 77,5 ± 9,5 vs. 74,8 ± 9,7; glucose: 104,0 ± 29,4 vs. 111,3 ± 36,5; Total cholesterol: 211,6 ± 38,7 vs. 192,4 ± 41,5; LDL-cholesterol: 128,7 ± 35,4 vs. 112,5 ± 36,0; p = 0,000. HCR was related to poly-pharmacy (62,5% vs. 26,1%) and average number of drugs (6,4 ± 3,5 for the HCR group vs. 4,0 ± 2,9), p < 0,001. Drugs accounted for 43.4% of total costs. Unitary adjusted cost per year was 2.445.98€ (IC:2.382,07–2.509,90) for the HCR group vs. 1.537,33€ (IC:1.505,53–1.569,13), p < 0.001. All components of costs showed significant differences between groups. **CONCLUSION:** Patients with HCR had higher rates of co-morbidity. Achievement of therapeutic objectives should improve in patients without hypertension and total cholesterol but with HCR (glucose, cLDL). Patients with this profile use more resources (particularly more drugs) and have higher health care costs. Health professionals should develop common strategies oriented to control main cardiovascular risk factors in primary care.

ECONOMIC BENEFIT OF IMPROVED PRESERVATION OF EXPLANTED ORGANS IN HEART TRANSPLANTATION

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OBJECTIVES: Surgical techniques and immunosuppressive drugs have been improved over the past decades, while the method of preserving and transporting organs has not. In the UK only 22.3% of hearts from all consented heart beating donors were recovered in June 2005, whilst cold ischeamic time (CIT) increased by an average of 34 minutes over 8 years. The Organ Care System (OCS) may alleviate the organ shortage and improve transplant outcomes by maintaining explanted hearts in the normal functioning state ex-vivo. A health economic evaluation analysis was undertaken to compute the economic benefit of improved transportability of explanted hearts from the UK societal point of view. **METHODS:** Improved preservation with OCS plus heart transplantation (IPTx) was compared to medical management on the transplantation waiting list (MM) and heart transplantation with conventional cold preservation method (CPTx). We assumed that IPTx increases heart transplantation rates by 40% and reduces CIT to <1 hr. UK cost vectors were derived from the published literature. Twenty year direct medical costs and QALYs were calculated for each arm. Reducing CIT to <1 hr may extend the graft half life by 2.2 years (Schnitzler 2006). Discount rates of 6% were used for costs and 1.5% for QALYs. WTP for a QALY gain was assumed to be 30,000 British