until termination (MCO termination, change to non-statin anti hyperlipidemic, or end of observation period).

RESULTS: Of 4,964 enrollees who received ≥2 statin prescriptions, 540 (11%) patients were classified as secondary prevention and 4424 (89%) primary prevention. The mean CMG while actively taking statin was 20.5% (SD 21.3, median 12.7) for the primary group and 21.9% (SD 22.7, median 13.3) for the secondary group (p = 0.34). The mean CMG until termination was 29.2% (SD 26.9, median 20.1) and 31.5% (SD 27.3, median 24.6) for the primary and secondary groups respectively (p = 0.06). Additional analyses will measure the effect of patient demographics, copayments, and prescriber specialty.

CONCLUSIONS: Compliance with statins was similar and sub-optimal in primary and secondary prevention populations. These data demonstrate that patients exhibit poor compliance while actively taking therapy and contribute to future risk by discontinuing therapy at undesirable rates. While universal compliance with prescribed therapy for all patients indicated for therapy is a desirable goal, incremental efforts should aim at improving compliance in those populations who are the most likely to benefit from their use.

**HP2**

**IS IT COST-EFFECTIVE TO IMPROVE COMPLIANCE WITH LIPID-LOWERING THERAPY?**

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OBJECTIVE: The National Cholesterol Education Program recently recommended the implementation of interventions to improve compliance with lipid-lowering medications; however, the costs and benefits of such interventions have not been well studied. We therefore evaluated the cost-effectiveness of compliance-enhancing interventions in patients treated with HMG Co-A reductase inhibitors (statins).

METHODS: A literature search was conducted to identify compliance-enhancing interventions that would be relevant to statin therapy. A Markov model was used to evaluate the programs in a hypothetical cohort of 5000 statin users 65–84 years of age with myocardial infarction. Costs and effectiveness of each strategy were accrued for the duration of treatment, based on published studies and the assumption of a linear relationship between compliance and benefits of therapy. Interventions were evaluated in terms of quality-adjusted life years gained (QALYs), direct medical costs in U.S. dollars, and incremental cost-effectiveness (cost per QALY gained).

RESULTS: Seven compliance-enhancing interventions were evaluated, including combinations of mailed refill reminders, unit-of-use (“blister-pack”) prescription packaging, telephone counseling by a pharmacist, and pharmacy or clinic-based drug therapy management. We found that compared to unaided compliance, these strategies would yield an average of 0.20 QALYs, with cost-effectiveness ratios between $17,700 and $36,600 per QALY gained. When compared incrementally, a 6-month program consisting of mailed educational information, refill reminders and a telephone call from a pharmacist dominated the other strategies, at $17,700 per QALY gained, compared to no intervention. When baseline levels of compliance were lowest, the clinic-based program was the dominant strategy.

CONCLUSIONS: Compliance-enhancing interventions appear to be an attractive way to recover some of the clinical benefits that are lost due to noncompliance with statins. For typical populations, the most cost-effective intervention provided patient education and refill reminders via the mail and telephone. Clinical trials comparing these interventions should be considered to confirm these results.

**HP3**

**IMPROVING THE SAFETY OF AMIODARONE IN THE CONGESTIVE HEART FAILURE POPULATION: BASELINE ASSESSMENT OF COMPLIANCE WITH NATIONAL GUIDELINES IN A LARGE CHF CLINIC**

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Patients with congestive heart failure (CHF) often are treated with amiodarone for ventricular or atrial arrhythmias. This agent is often preferred due to its purported lack of hemodynamic effects, however other toxicities may occur. Therefore, routine monitoring of lung, thyroid, and liver function is recommended. Sanoski CA, et al previously reported that laboratory tests were performed according to accepted guidelines in 23% of patients before referral to an amiodarone clinic compared to 90% after referral.

OBJECTIVE: To establish the role for a formal amiodarone monitoring program in a multidisciplinary CHF clinic.

METHODS: After identifying which patients were taking amiodarone, a retrospective chart review was used to determine baseline adherence to national guidelines for performance of chest x-rays, thyroid and liver function.

RESULTS: Of the 450 patients in the clinic, 47 were taking amiodarone. Thirty-two patients were male and 15 female with an average age of 69 + 13 years (53% ischemic). Indication for amiodarone therapy: 60% atrial fibrillation/flutter, 21% ventricular tachycardia, 13% sudden death, 6% unknown. The chart review period was 18.7 + 16.3 months. Baseline analysis revealed annual chest x-ray in 42.5% of cases; semiannual thyroid function in 25%; and semiannual liver function in 40%. Of the 29 patients still taking amiodarone, 52% did not have a chest x-ray in the previous 12 months, 52% and 34%
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did not have thyroid or liver function test, respectively in the previous 6 months.
CONCLUSIONS: Patient safety from amiodarone toxic effects is of high concern. Despite national guidelines and a high prevalence of use, we found that over half of the patients receiving amiodarone therapy were not being monitored appropriately for toxicity. We conclude that there is need for a formal amiodarone monitoring program in this setting. We have designed and are testing a chart reminder system to address this deficit.

THE IMPACT OF ADHERENCE TO OSTEOPOROSIS THERAPY ON FRACTURE RATES IN ACTUAL PRACTICE
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OBJECTIVES: Clinical trials have demonstrated that drug therapy can reduce osteoporosis-related fracture risk in women over 50 years by up to 40% provided they consistently take their medication for a year or more. Non-adherence with drug therapies not only limits the drugs’ effectiveness, but could also be associated with a higher fracture risk. The objective of this study was therefore to estimate fracture risk in relation to adherence with osteoporosis medication in actual practice.

METHODS: Demographic, prescription drug use, physician services and hospitalization information for females with osteoporosis who were dispensed an osteoporosis medication between 1996 and 2001 (entry date defined as first dispensing in this period) was obtained from the Saskatchewan Health data files. Adherence to treatment was defined as drug available to cover 80% of the time. Subsequent fractures were identified via hospitalizations or physician contacts with a relevant diagnosis or procedure code. The risk of fractures in relation to adherence was examined using a Cox proportional hazards model with time-dependent covariates. The impact of other patient characteristics, including age, having suffered a prior fracture, prior use of osteoporosis medication and steroids, was also examined.

RESULTS: 11,249 women suffering from osteoporosis were identified with a mean age at the time of the index prescription of 68.4 years and average follow-up of 2.3 years with a fracture rate of 4.5% per year. Patients who adhered experienced a 16% lower fracture rate. The effect of adherence was maintained after controlling for other patient characteristics that independently predict the fracture rate, including interactions.

CONCLUSIONS: These results indicate that improving adherence in actual practice will significantly decrease the osteoporosis-related fracture risk.

CARDIOVASCULAR DISEASES/DISORDERS II

COST-EFFECTIVENESS OF STATINS IN PRIMARY PREVENTION OF CHD
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OBJECTIVES: To investigate under which circumstances statins can be considered cost-effective in primary prevention of CHD, and to identify the most sensitive parameters.

METHODS: A Markov Model is used to tackle the research question for the health insurance and the social insurance in Germany. Life years gained are chosen as effectiveness parameter. Mortality is based on the concept of Gompertzian analysis, linking mortality rates for persons with and without coronary heart disease (CHD). Costs components comprise of prevention costs, costs in the life years gained, national insurance contributions and avoided costs for CHD-treatment. Age and gender specific costs and expenditures for health states are estimated from data of the social insurance including pension payments. CHD-risk estimates are primarily based on Framingham risk equations, but an alternative method using current CHD-mortality data is used as well.

RESULTS: With yearly Statin prices of 300 € ($/€ = .9) and a relative CHD-risk reduction of 28%, statin treatment for a 50 year old male with a yearly CHD-risk of 1.5% would cost between 23,000 € and 26,000 € per life year gained for the social insurance and 13,000 € and 16,000 € for the health insurance. For higher CHD-risks statin treatment gets more cost-effective. At a given value of CHD-risk, cost-effectiveness is generally better for younger patients. The most sensitive parameters are the yearly statin prices and the relative risk reduction. Per rise in statin prices of 100 €, cost-effectiveness would increase between 5,000 € and 7,000 € per life year gained depending on age and gender. Avoided CHD-treatment costs, however, have only a minor impact on the cost-effectiveness-ratio.

CONCLUSIONS: Treatment guidelines for CHD prevention incorporating cost-effectiveness considerations are vulnerable to future statin pricing after the soon fall of protection by patent. Correct risk estimation remains one important objective in targeting resources for primary CHD-prevention.

COMPARING RECENT CARDIOVASCULAR MEDICATIONS USING AN NNT MODEL
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The number needed to treat (NNT) has been promoted as a tool for helping decision makers but valid compari-