are not receiving appropriate follow-up care. The cause of these low screening rates should be examined in future research.

**PEV8**

**CLINICAL AND ECONOMIC IMPACTS OF PHARMACIST-MANAGED ANTICOAGULATION MONITORING SERVICES**

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**OBJECTIVE:** This study evaluated the effects of pharmacist-managed anticoagulation monitoring services on the clinical and economic outcomes of patients prescribed warfarin therapy.

**METHODS:** A retrospective chart review was conducted for patients newly initiated with warfarin therapy between November 1997 and April 1998. Patients used warfarin for a minimum of 2 months and were followed for either one-year post-initiation of warfarin usage or until discontinuation of warfarin therapy, whichever was earlier. Comparisons were made between the group of patients receiving anticoagulation monitoring through usual medical care (UMC) by their physician (“UMC group”) and those patients enrolled in the pharmacist-managed anticoagulation clinic (“AC patients”). Outcome measures for the two groups include anticoagulation control, incidence of warfarin adverse effects or recurrent thromboembolic disorder, and economic evaluation for inpatient and outpatient health care services utilized.

**RESULTS:** Complete data for 63 UMC patients (625 patient-months) and 18 AC patients (232 patient-months) indicate that AC patients had better anticoagulation control than UMC patients (51% of INRs within target range versus 41%, respectively). However, AC patients experienced more frequent minor recurrences (events not requiring hospitalization) of thromboembolic disorders or bleeding associated with warfarin (0.11 events per AC patient-month versus 0.08 events per UMC patient-month). The incidence of complications that necessitated hospitalization was similar between the two groups. The estimated annual inpatient cost of treating the complications associated with anticoagulant therapy was $168 less per AC patient but equivalent for both groups for outpatient services ($348 annually). Inpatient and outpatient charges for all medical claims for AC patients were less than half that found for UMC patients ($241 and $405 per patient-month versus $501 and $878 per patient-month, respectively).

**CONCLUSION:** Although treatment-related complications can still occur, pharmacist-managed anticoagulation monitoring services provided a better means of maintaining anticoagulation control and reducing medical care costs for patients on warfarin therapy.

**PEV9**

**ASSESSING RISK REDUCTION AND NNT AMONG TYPE 2 DIABETICS TREATED WITH FIBRIC ACID DERIVATIVES**

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**OBJECTIVES:** Type 2 diabetics with combined hyperlipidemia are at increased risk of developing coronary heart disease (CHD). Fibrates have been shown to improve lipid parameters; thereby, decreasing CHD risk among treated patients. We compare fenofibrate to gemfibrozil treatment of combined hyperlipidemia in type 2 diabetics by determining the following: one year absolute and relative risk reductions in CHD, Number Needed to Treat (NNT) to prevent one case of CHD, and number of CHD cases prevented.

**METHODS:** In patients with lipid parameters consistent with type 2 diabetes, absolute risk (AR) of developing CHD in one year was determined using the Anderson cardiovascular risk equation. Relative risk (RR) comparing no treatment to treatment and NNT were calculated. The number of CHD cases prevented in one year was calculated from NNT and prevalence characteristics of a 500,000 member Medicaid population. Sensitivity analyses were performed on age, smoking status, drug dose, and time horizon.

**RESULTS:** Base case patients (60 year-old female, non-smoker) treated with fenofibrate (AR = 1.1, RR = 1.92, NNT = 97) had lower absolute risks, more favorable relative risks comparing no treatment to treatment, and required treatment of fewer patients to prevent one case of CHD compared to gemfibrozil (AR = 1.5, RR = 1.42, NNT = 157). In one year, in patients >50 years, 91 CHD cases were prevented through the model with fenofibrate treatment, compared to 56 cases prevented with gemfibrozil. Each sensitivity analysis showed fenofibrate had the more favorable AR, RR, and NNT. For example, using a five year time horizon on a 70 year-old smoking male, fenofibrate’s AR = 17.8, RR = 1.41, and NNT = 14, while with gemfibrozil’s AR = 21.0, RR = 1.20, and NNT = 24. In five years, 348 cases of CHD were prevented with fenofibrate compared to 206 with gemfibrozil.

**CONCLUSIONS:** Fenofibrate proves a better healthcare value than gemfibrozil due to its superior risk reduction and prevention of more cases of CHD.

**PEV10**

**BLOOD PRESSURE REDUCTION AND GAINS IN LIFE EXPECTANCY BASED UPON A MARKOV MODEL OF PRIMARY AND SECONDARY CARDIOVASCULAR EVENTS**

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**OBJECTIVES:** The purpose is to compare the efficacy and cost of two widely used antihypertensive drugs, the β-blocker atenolol and the calcium channel blocker, diltiazem, among African-American and Caucasian hypertensive patients using a Markov model. The model was used to assess the impact of cost and effectiveness of these drugs on healthcare outcomes, including blood pressure control and cardiovascular events in African-American and Caucasian hypertensive patients.

**METHODS:** A Markov model was developed to simulate the clinical and economic outcomes of patients initiated on atenolol or diltiazem for hypertension until discontinuation of therapy. The Markov model was used to simulate the clinical and economic outcomes of patients initiated on atenolol or diltiazem for hypertension until discontinuation of therapy. The model was used to assess the impact of cost and effectiveness of these drugs on healthcare outcomes, including blood pressure control and cardiovascular events in African-American and Caucasian hypertensive patients.

**RESULTS:** The model was used to simulate the clinical and economic outcomes of patients initiated on atenolol or diltiazem for hypertension until discontinuation of therapy. The model was used to assess the impact of cost and effectiveness of these drugs on healthcare outcomes, including blood pressure control and cardiovascular events in African-American and Caucasian hypertensive patients.

**CONCLUSIONS:** The model was used to simulate the clinical and economic outcomes of patients initiated on atenolol or diltiazem for hypertension until discontinuation of therapy. The model was used to assess the impact of cost and effectiveness of these drugs on healthcare outcomes, including blood pressure control and cardiovascular events in African-American and Caucasian hypertensive patients.
OBJECTIVES: The long-term benefits on life expectancy of more effective antihypertensive strategies to lower blood pressure are not well described, particularly for certain groups with different cardiovascular (CV) risk factor profiles. We projected the life expectancy benefits of anti-hypertensive treatment strategies using a unique primary/secondary prevention Markov Model derived from a large epidemiologic database.

METHODS: Longitudinal data from 37,279 middle-aged and older male and female health professionals were pooled to develop a primary and secondary CV event Markov model estimating the long-term benefits of anti-hypertensive treatment based on both systolic and diastolic blood pressure reduction. Seven patient states were defined: no CV event history, stroke, myocardial infarction, revascularization, non-CV death, CV death, and history of CV event. Risk functions were developed from gender-specific multivariate Cox proportional hazards models for primary events, and age-adjusted models for secondary events. The area between survival curves of different interventions was calculated to estimate the incremental gains in life expectancy for the superior anti-hypertensive treatment intervention.

RESULTS: We assumed a pre-treatment blood pressure of 160 mmHg systolic/95 mmHg diastolic. We further assumed that Strategy A yields a lowering of 20/13 mm Hg and Strategy B yields a reduction of 13/8 mm Hg. Post treatment blood pressures at the start of the simulation were thus 140/82 mmHg for Strategy A and 147/87 mmHg for Strategy B. Assuming an age of 35 years at baseline and cycling the model for 65 years, a life expectancy gain of 0.79 years is achieved for Strategy A versus Strategy B. In a diabetic population, there was a life expectancy gain of 0.7 years is achieved for Strategy A versus Strategy B. We further assumed a pre-treatment blood pressure of 160 mmHg systolic/95 mmHg diastolic. We further assumed that Strategy A yields a lowering of 20/13 mm Hg and Strategy B yields a reduction of 13/8 mm Hg. Post treatment blood pressures at the start of the simulation were thus 140/82 mmHg for Strategy A and 147/87 mmHg for Strategy B. Assuming an age of 35 years at baseline and cycling the model for 65 years, a life expectancy gain of 0.79 years is achieved for Strategy A versus Strategy B.

CONCLUSIONS: Substantial gains in life expectancy due to reduction in both primary and secondary CV events can be achieved by superior strategies of blood pressure lowering.

CARDIOVASCULAR DISEASES/DISORDERS—
Economic Outcomes Presentations

THE COST OF WARFARIN MONITORING IN ANTIMOAGULATION CLINICS: A MULTI-SITE MANAGED CARE STUDY
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OBJECTIVE: To estimate the average cost of anticoagulation clinic services from a provider perspective.

METHODS: Using a retrospective cohort approach, a random sample of 600 patients was selected from a geographically diverse managed care sites (N = 200 per site) with anticoagulation clinics and followed for up to one year. Care was provided under a traditional nurse or pharmacist managed clinic model with most encounters involving telephone contacts. Study patients included adults aged 18+ years with a diagnosis of nonvalvular atrial fibrillation who received warfarin for at least 30 days. Patient contacts were evaluated based on complexity (education, warfarin dose adjusted, warfarin dose not adjusted) and the total cost of anticoagulation clinic care was calculated for staff time, laboratory tests, and overhead. Unit costs were estimated based on national data. Labor costs were measured by observing the actual time spent by clinic staff on individual patient encounters using a prospective time study (“activity-based” approach), and through a survey of budgeted labor hours (“budgeted-cost” approach).

RESULTS: The average age of patients was 72 years and 56% were female. Approximately 85% were white. About 75% of patients completed one year of clinic follow-up (mean duration: 10.5 months). Patients averaged 18 clinic contacts. The cost of staff time for warfarin monitoring during follow-up was estimated to be $91 under the activity-based approach and $176 using the budgeted-cost approach. These costs increased to $244 and $330 for the activity-based and budgeted-cost approaches, respectively, once laboratory tests and overhead were included. Average costs for patients who were followed for a full year were $268 and $362, respectively. While anticoagulation control was relatively similar across sites (60% to 65% time in INR range), there was more marked variation in costs.

CONCLUSIONS: This study provides a detailed, multisite assessment of the costs of warfarin monitoring using multiple costing methodologies.

IMPACT OF ATRIAL FIBRILLATION ON RESOURCE UTILIZATION AND COSTS IN PATIENTS WITH UNDERLYING CARDIOVASCULAR DISEASES
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Atrial fibrillation (AF), the most common persistent arrhythmia, increases the risk of stroke manifolds. This risk is further enhanced in the presence of underlying cardiovascular diseases (CVD). Yet, the health care costs and utilization associated with this condition have not been well studied.

OBJECTIVE: To compare the resource utilization and costs among patients with and without AF in an employer-based privately insured population with underlying CVD.

METHODS: Retrospective claims data from a large group of self-insured employers were used. Patients continuously enrolled from January 1, 1996 to December 31,