OBJECTIVE: Chronic non-cancer pain (CNCP) is a condition that may result in high healthcare costs and reduced workplace productivity. The objective of this study was to quantify work loss and pain-related healthcare utilization among employees with CNCP. **METHODS:** A retrospective analysis was conducted using the MEDSTAT Health and Productivity Management database, which includes absences, worker's compensation and short-term disability claims for employees from six large U.S. corporations along with inpatient, outpatient, and pharmacy claims from 1997–1999. Presence of CNCP was defined as 90+ days supply of opioids within the study period and a pain-related diagnosis. Workdays lost (absences plus short-term disability) were converted to dollars ($US1998) using location-specific wage rates from the US Bureau of Labor Statistics. Healthcare utilization included opioid usage, pain-related outpatient medical visits, and pain-related inpatient hospitalizations. **RESULTS:** From the original outpatient data file of 236,736 employees, 2,459 had CNCP and were eligible to have work loss data reported, of which 1,512 experienced sickness absence(s) and/or short-term disability days. Those with work loss experienced a longer median duration of pain than those without work loss (887 vs. 934.5 days). Pain-related direct costs were $5378 per employee per year. Indirect costs (wages lost per employee per year) were $5339–$7475, based on sensitivity analyses. The total impact of CNCP for employees whose work loss was recorded was at least $2.1 million per employer per year. **CONCLUSIONS:** Few data have been compiled to examine the economic impact of CNCP specifically to employers. The findings demonstrate that CNCP is associated with significant resource consumption and lost workdays, and suggest a need for employer-sponsored pain management programs.

EP4

ALLERGY PREVALENCE, COST, AND PRODUCTIVITY LOSS IN AN INSURED EMPLOYEE POPULATION

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OBJECTIVES: This analysis quantifies the prevalence, health benefits cost, and real productivity loss experienced by employees as a result of allergies. Healthcare claims and employee population data are used to quantify the prevalence of respiratory system allergies. Additionally, demographic, health benefits, and output-based productivity data are used to compare the health benefits cost and productivity of employees with and without allergies. **METHODS:** Using data from October 2000 to September 2002, this study examines 86,000 geographically-disperse employees. An employee was defined to have an allergy diagnosis if the employee had a healthcare claim with a primary ICD9 code of 477.xx or 493.0x. Logistic regression was used to determine the demographic factors that were associated with the likelihood of filing an allergy claim. In addition, tobit and linear regression models were used to determine the isolated impact of an allergy diagnosis on an employee's health benefits cost and productivity output. **RESULTS:** Of the employee population examined, 17.3% were diagnosed with allergies during the 2-year period. An allergy diagnosis was associated with a subsequent isolated increase of $106 per month ($p < 0.001$) in the employee's total benefits cost (including healthcare, prescription drug, sick leave, short- and long-term disability, and workers' compensation). Similarly, an allergy diagnosis was associated with a subsequent isolated decrease in productivity (units processed per hour) of 2.7% ($p < 0.001$). **CONCLUSIONS:** Nearly one in six employees were diagnosed with allergies during the study period, resulting in significantly higher costs to the employer and significantly lower productivity. Employers will use this information to more accurately assess the benefits of supporting effective allergy study and treatment.

SESSION III

ADHERENCE

AD1

NON-PROCUREMENT OF PRESCRIPTION MEDICATIONS DUE TO COST IN MEDICARE BENEFICIARIES: RESULTS FROM THE HEALTH AND RETIREMENT STUDY

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OBJECTIVES: Recently reported rates of Medicare beneficiaries restricting prescription medication use because of cost ranges from 1.6 to 22%. A reliable estimate of prescription non-procurement due to cost and an understanding of this behavior is essential to appropriate policy development. **METHODS:** The 2000 Health and Retirement Study, nationally representative of Americans born before 1947, provides cross-sectional data regarding respondent insurance coverage and prescription non-procurement. All non-institutionalized, Medicare beneficiaries age 65 and older were identified. Weighted bivariate analysis and multivariate stepwise logistic regression modeling determined the association and independent predictive value of several risk factors, including total health insurance coverage, on prescription non-procurement. **RESULTS:** Data for 9771 respondents were identified. Prescription non-procurement due to cost was reported in 4.5%, 8.5%, and 9.8% of respondents with Medicare plus private insurance, Medicare only, and Medicare plus Medicaid, respectively. Bivariate analysis revealed similar risk factor-related trends both within and between health insurance categories. The final regression model included several significant factors ($p < 0.0001$) predictive of non-procurement, the most notable being income, number of symptoms, and total prescription

costs. In this model, prescription non-procurement was more likely to be reported in the Medicare-only population (OR: 1.47; 95% CI 1.46–1.48) and in the Medicare plus Medicaid population (OR: 1.11; 95% CI 1.10–1.12) as compared to respondents with Medicare plus private insurance coverage. **CONCLUSIONS:** Significantly different rates of persons who forego filling a prescription for cost reasons were observed among Medicare beneficiaries. More vulnerable groups of seniors were identified. Dual eligible Medicare/Medicaid enrollees and those with Medicare alone are more likely to restrict medication procurement due to cost.

AD2

MEDICATION TREATMENT PERSISTENCE OF OVERACTIVE BLADDER/URINARY INCONTINENCE PATIENTS IN A CALIFORNIA MEDICAID PROGRAM AND THE BENEFIT OF THEIR REFILL ADHERENCE ON URINARY TRACK INFECTION

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OBJECTIVES: 1) To explore 1-year persistence pattern of Overactive Bladder/Urinary Incontinence (OAB/UI) medication treatment; 2) to discover factors associated with persistence; and 3) to investigate the benefit of refill adherence on urinary track infection (UTI). **METHODS:** Retrospective analyses on continuously enrolled adult patients diagnosed with OAB/UI and received at least one OAB/UI medication from July 1999 to April 2001 (with 6-month run-in period and 1-year follow-up period) are employed. Time to discontinuity, defined as the period from the index date to the discontinuity date (when any medication-uncovered interval is longer than 30 days), is used to describe the persistence pattern of patients. Adherence is measured by medication possession ratio (MPR). A Cox Proportional Hazard model is applied to reveal risk factors of non-persistence. A logistic regression is used to examine the relationship of those same factors with refill adherence and to assess the effect of adherence on UTI incidence rate. **RESULTS:** Of 6518 eligible patients, 26.8% have only 1 prescription. 5751 patients (88.2%) discontinue within the following year, among which, 92.2% fail to continue treatment after 183 days. Only 952 patients (14.6%) exhibit good adherence (MPR >= 0.8). The mean MPR of the whole cohort is 0.39 and the median is 0.24. Significant predictors of higher persistence include Caucasians, 75 years old or above, prior medication use, and initiating extended-release form of drug. Patients with prior prescription of antidepressant or diagnosis of depression show lower persistence. Similar results are found for adherence. Logistic regression indicates that good refill adherence reduces the risk of being diagnosed with UTI by 33% in the post-treatment period (P = 0.0008, OR = 0.672). **CONCLUSIONS:** Both persistence of OAB/UI medication and refill adherence are low, suggesting the need to develop effective interventions in OAB/UI and UTI.

AD3

PREDICTIVE MODEL OF MEDICATION ADHERENCE IN CARDIOVASCULAR DISEASE

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OBJECTIVES: Medication non-compliance has been a growing concern for healthcare management and can result in progression of cardiovascular disease (CV) and an increase in economic burden. To develop models to predict the risk for future medication non-compliance among patients with hypertension and hyperlipidemia. **METHODS:** Two predictive models were constructed using pharmacy and medical claims from 2380 patients newly treated with anti-hypertensive medications and 3387 patients newly treated with statins in a managed care setting. The outcomes of interest were the future medication compliance rates for both disease states over a one-year follow-up period. The potential predictors of compliance included patient characteristics such as age, gender, type of insurance plan, Chronic Disease Score (CDS), presence of select comorbidities, copayments, total medication burden, hospital encounters, outpatient physician encounters, and initial compliance (0–3 months of therapy immediately before the follow-up period). Linear regression models were applied to construct the models. Each population was randomly split by a 2 to 1 ratio to facilitate spilt-sample validation of the models. **RESULTS:** Based on the hypertension model, age, gender, total co-payments, total medication burden, and initial compliance showed significant relationship with compliance ($R2 = 0.45$). Based on the hyperlipidemic model, age, gender, presence of a second CV condition (e.g. angina), outpatient physician encounters, co-payments at drug initiation, total medication burden, and initial compliance demonstrated significant relationship with compliance ($R2 = 0.43$). In both populations, initial compliance was the strongest predictor of sustained compliance. **CONCLUSION:** These models can serve as a useful tool to guide providers in promoting medication compliance. Both models suggest that assisting the patient to establish compliant behavior within the first three months of a new treatment regimen can significantly influence sustained medication adherence with CV medications.

AD4

A TIME-VARYING SURVIVAL MODEL FOR THE ASSOCIATION OF ADHERENCE WITH HMG-COA INHIBITORS TO THE RISK OF ADVERSE EVENTS

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