

mentioned a reference that actually indicated that dichotomization of the continuous adherence variable was inappropriate. **CONCLUSION:** MPR and gap between refills were the most commonly used measures of medication adherence. Almost one third of the studies used dichotomous measures. A medication adherence of 80% of the therapy was typically indicated as the cut-point between adherence and non-adherence. There is no accepted clinical or pharmacological rationale for medication adherence threshold selection. The use of continuous variables to measure medication adherence is recommended.

**PHP4****THE IMPACT OF COPAYMENTS OR BRAND NAMED DRUG ON MEDICATION PERSISTENCE**

Wu J<sup>1</sup>, Nichol MB<sup>1</sup>, Knight TK<sup>1</sup>, Mahoney J<sup>2</sup>, Berman C<sup>2</sup>

<sup>1</sup>University of Southern California, Los Angeles, CA, USA,

<sup>2</sup>Pitney Bowes Inc, Stamford, CT, USA

**OBJECTIVE:** To examine the impact of copayments or brand named drug as well as other factors on medication persistence from a large U.S. employer. **METHODS:** We analyzed medical and pharmaceutical claims data from 2002 through 2006 for new users prescribed a single agent for either three antihypertensive (angiotensin converting enzyme inhibitors, beta blockers, and calcium blockers) or two anti-diabetic (biguanides and sulfonylureas) therapeutic classes. Nonpersistence with medication was measured using three methods: medication possession ratio (MPR) <0.8; number of days to the first drug coverage gap of  $\geq 15$  days; and number of days to drug discontinuation ( $\geq 90$  days gap). Logistic regression and Cox proportional hazard models were performed to evaluate the association between the potential risk factors and the likelihood of medication nonpersistence. **RESULTS:** A total of 1422 members with 12 months claim data following the first drug filled were identified. Fifty-four percent were male with a mean age  $52.8 \pm 8.0$  years, and 44% initially used a brand named drug. The logistic regression results revealed that increasing age per year (OR = 0.966; 95% CI = 0.952–0.979), PPO (OR = 0.424; CI = 0.261–0.689) or HMO insurance (OR = 0.440; CI = 0.262–0.739) as compared to conventional fee for service coverage were less likely to have MPR < 0.8. Management workers (OR = 1.475; CI = 1.113–1.954) were more likely to have MPR < 0.8. MPR < 0.8 was not associated with use of an initial brand named drug, comorbidities, or health care utilization in the six months prior to initiating medication therapy. The Cox models showed that the risk for a gap increased 1.1% (HR = 1.011, CI = 1.004–1.019), and medication discontinuation increased 0.9% (HR = 1.009, CI = 1.003–1.014) with each \$1 increase in initial drug copayments. **CONCLUSION:** Younger employees, management workers, conventional fee for service insurance coverage, and an increase in initial copayments are factors predictive of greater risk for noncompliance with medications. These data may be helpful for employers when making drug benefit design decisions.

**PHP5****ADHERENCE AND SWITCHING WITH DRUGS USED FOR THE PROPHYLAXIS OF ORGAN REJECTION**

Varasteh LT, Pedan A, Asumeng-Denteh E

Adheris, Inc, Burlington, MA, USA

**OBJECTIVE:** The purpose of this study was to quantify the extent of nonadherence and to determine the rate of switching across organ rejection drugs. **METHODS:** Blinded prescription data from 35 national retail pharmacy chains was analyzed for 13,250 patients taking sirolimus, cyclosporine, and tacrolimus. Cumulative drug consumption (total days supply) during the one

year follow up period was employed as the measure of adherence. Kaplan Meier estimates of survival (persistence) curves were used to assess the time to discontinuation and to calculate the one-year rate of discontinuation. Baseline patient characteristics, including age, gender, geographic region, median income, index quantity dispensed, population density, co-pay, and index refill and days supply prescribed were analyzed. **RESULTS:** Adherence data across these drugs showed that sirolimus, cyclosporine, and tacrolimus patients on average obtained 5.5 ( $\pm 4.5$ ), 5.2 ( $\pm 5.4$ ), and 6.5 ( $\pm 5.3$ ) fills, and 170.8 ( $\pm 132.9$ ), 159.2 ( $\pm 163.96$ ), and 194.8 ( $\pm 159.6$ ) days supply of medication over 12 months, respectively. At day 60, 41% of sirolimus, 44% of tacrolimus, and 52% of cyclosporine patients discontinued therapy. After 6 months, 68% of tacrolimus and sirolimus and 77% of cyclosporine patients discontinued therapy. The rate of switching to another agent was 6.5% for sirolimus, 1.4% for tacrolimus, and 1.1% for cyclosporine at month 6, and 10.9%, 2.3%, and 1.8% at month 12, respectively. **CONCLUSION:** Even though organ transplant drugs are vital for transplant patients, 68% to 77% of patients discontinue therapy after 6 months. Research has showed that nonadherence to immunosuppressive therapy is the leading cause of organ rejection, organ loss, and death. Efforts to maintain patients on these drugs are needed in the beginning of and throughout treatment to avoid organ rejection.

**PHP6****PREDICTORS OF NONCOMPLIANT COST-CUTTING BEHAVIORS AMONG ADULTS IN THE UNITED STATES**

Kannan H, Bolge SC

Consumer Health Sciences, Princeton, NJ, USA

**OBJECTIVE:** To determine the demographic, insurance, and health status predictors of noncompliant cost-cutting behavior among U.S. adults. **METHODS:** Data were from quarters one and two of the 2007 National Health and Wellness Survey (NHWS), an internet-based study of the health care attitudes, behaviors, disease states, and outcomes of a demographically representative sample of adults age 18+. Noncompliant cost-cutting behaviors were defined as taking less medication than prescribed, cutting tablets in half, or buying fewer tablets. Logistic regression analysis was used to determine the demographic, insurance, and health status predictors of noncompliant cost-cutting behavior. **RESULTS:** Of the 42,010 NHWS respondents, 12% reported some noncompliant cost-cutting behavior, more specifically 7% reported taking less medication than prescribed, 6% reported cutting tablets in half, and 2% reported buying fewer tablets. Significant predictors of greater likelihood of noncompliant cost-cutting behavior include being non-white (OR = 1.182,  $p < 0.001$ ), having a college degree (OR = 1.094,  $p = 0.009$ ), having individual or family insurance purchased directly (OR = 1.300,  $p < 0.001$ ), purchasing medications outside the U.S. (OR = 3.862,  $p < 0.001$ ), number of physical comorbid conditions (OR = 1.176,  $p < 0.001$ ), having a psychiatric condition (OR = 1.620,  $p < 0.001$ ), currently smoke (OR = 1.137,  $p < 0.001$ ), and body mass index (OR = 1.006,  $p = 0.007$ ). Significant predictors of lesser likelihood of noncompliant cost-cutting behavior include age (OR = 0.996,  $p = 0.001$ ), having insurance through the Veteran's Administration (OR = 0.514,  $p < 0.001$ ), and having Rx coverage (OR = 0.808,  $p < 0.001$ ). Gender, marital status, annual income greater than \$50,000, number of adults in household, and insurance through employer, Medicaid, or Medicare were not significant predictors of non-compliant cost cutting behavior. **CONCLUSION:** There are several significant predictors of noncompliant cost-cutting behavior. Knowing these predictors may help in targeting cost

savings and compliance programs at those who need them the most.

## PHP7

#### THE EFFECTS OF NONCOMPLIANT COST-CUTTING BEHAVIORS ON OUTCOMES AMONG ADULTS IN THE UNITED STATES

Bolge SC, Kannan H

Consumer Health Sciences, Princeton, NJ, USA

**OBJECTIVE:** To quantify the effects of noncompliant cost-cutting behavior on health-related quality of life (HRQOL), work productivity, and activity impairment among U.S. adults. **METHODS:** Data were from quarters one and two of the 2007 National Health and Wellness Survey (NHWS), an internet-based study of the health care attitudes, behaviors, disease states, and outcomes of a demographically representative sample of adults age 18+. Noncompliant cost-cutting behaviors were defined as taking less medication than prescribed, cutting tablets in half, or buying fewer tablets. Outcomes measures include the SF12V2 and the Work Productivity and Activity Impairment (WPAI) questionnaire. Linear regression analysis was used to control for gender, age, race, marital status, education, and comorbid conditions. **RESULTS:** Of the 42,010 NHWS respondents, 7% took less medication than prescribed, 6% cut tablets in half, and 2% bought fewer tablets. Controlling for potential confounders, SF12 physical and mental summary scores are significantly lower for those taking less medication (2.3 and 2.5 points lower,  $p < 0.001$ ), those cutting tablets in half (0.9 and 1.1 points,  $p < 0.001$ ), and those buying fewer tablets (1.5 and 1.6,  $p < 0.001$ ). Controlling for potential confounders, WPAI overall work loss and WPAI activity impairment are significantly lower for those taking less medication (10.3 and 7.2 points lower,  $p < 0.001$ ), those cutting tablets in half (11.2 and 5.3 points,  $p < 0.001$ ), and those buying fewer tablets (15.8 and 8.2,  $p < 0.001$ ). **CONCLUSION:** Noncompliant cost-cutting behavior negatively affects humanistic outcomes. By decreasing this behavior cost savings and compliance programs should have a positive effect on humanistic outcomes.

## PHP8

#### THE EFFECTS OF NONCOMPLIANT COST-CUTTING BEHAVIORS ON INDIRECT COSTS AMONG ADULTS IN THE UNITED STATES

Bolge SC, Kannan H

Consumer Health Sciences, Princeton, NJ, USA

**OBJECTIVE:** To quantify the effects of noncompliant cost-cutting behavior on health-related quality of life (HRQOL), work productivity, and activity impairment among adults in Europe. **METHODS:** Data were from the 2007 European National Health and Wellness Survey (NHWS), a self-administered, Internet-based study of the health care attitudes, behaviors, disease states, and outcomes of a demographically representative sample of adults age 18+ across five European countries: France, Germany, Italy, Spain, and the UK. Three noncompliant cost-cutting behaviors were analyzed: taking less medication than prescribed, cutting tablets in half, and buying fewer tablets. Outcomes measures included the SF12V2 and the Work Productivity and Activity Impairment (WPAI) questionnaire. Linear regression analysis was used to adjust for gender, age, country of residence, marital status, education, and physical and psychiatric comorbid conditions. **RESULTS:** Of the 53,524 NHWS respondents, 3.1% took less medication than prescribed, 2.1% cut tablets in half, and 1.6% bought fewer tablets. Unadjusted results showed a negative association

between these behaviors and indirect costs. Adjusting for potential confounders, SF12 physical and mental summary scores were significantly lower for those taking less medication (2.2 and 2.4 points lower,  $p < 0.001$ ), those cutting tablets in half (1.8 and 2.0 points lower,  $p < 0.001$ ), and those buying fewer tablets (1.8 and 2.3 points lower,  $p < 0.001$ ). Adjusting for potential confounders, WPAI overall work loss and WPAI activity impairment were significantly lower for those taking less medication (11.0 and 9.2 points lower,  $p < 0.001$ ), those cutting tablets in half (13.4 and 6.3 points lower,  $p < 0.001$ ), and those buying fewer tablets (10.1 and 7.7 points lower,  $p < 0.001$ ). **CONCLUSION:** Noncompliant cost-cutting behavior negatively affects indirect costs, specifically HRQOL, work productivity, and activity impairment. By decreasing this behavior cost savings and compliance programs should have a positive effect on humanistic outcomes.

## PHP9

#### UNITED STATES PHYSICIANS AND IN-OFFICE DRUG ADMINISTRATION: THE CONCEPT OF "INCIDENT-TO" SERVICES

Pierce CA<sup>1</sup>, Baker JJ<sup>2</sup>

<sup>1</sup>The Resource Group, Richfield, OH, USA, <sup>2</sup>The Resource Group, Pickton, TX, USA

**OBJECTIVE:** The U.S. Centers for Medicare and Medicaid Services (CMS) generally pays for non-institutional-based services and supplies "incident to" a physician's professional service. This study explores the concept of incident-to, the regulations and guidance surrounding its use and presents practical considerations for physicians. **METHODS:** Incident-to guidance provided by CMS was collected, arranged in order of issuance, abstracted and analyzed. A compilation of relevant resources, a glossary and checklist tool were also created as part of the project. **RESULTS:** Federal regulations at 42 CFR 410.26(b) specify criteria for "incident to" services. Medicare Part B pays for services and supplies incident to the service of a physician, including drugs or biologicals that are not usually self-administered. The services and supplies must be furnished in a non-institutional setting to non-institutional patients and be of an integral, though incidental, part of the service of a physician in the course of diagnosis or treatment of an injury or illness. They are also provided without charge or included in the bill of a physician. Such services are typically performed by non-physician staff however require direct personal supervision by the physician. The U.S. Office of the Inspector General (OIG) has announced incident-to services as an area of study in their 2008 Work Plan. **CONCLUSION:** The concept of incident-to services is commonly misunderstood and may therefore present a Medicare compliance risk for physicians. It is essential for physicians and their practice decision-makers to understand and apply the CMS regulations surrounding incident-to services in order to appropriately bill and be reimbursed by Medicare for the provision of Part B separately payable drugs in non-institutional settings.

#### HEALTH CARE USE & POLICY STUDIES— Consumer Role in Health Care

## PHP10

#### CREATION OF A RISK RATING SYSTEM TO COMMUNICATE DRUG SAFETY INFORMATION TO CONSUMERS

Cascade EF<sup>1</sup>, Stephenson H<sup>2</sup>

<sup>1</sup>Quintiles, Inc, Falls Church, VA, USA, <sup>2</sup>Guard, Inc, Princeton, NJ, USA

**OBJECTIVE:** With the withdrawal of Zelnorm, recall of products such as Ranbaxy's generic gabapentin, and the increase in