warning extended to conventional antipsychotics). A 2011 AHRQ comparative effectiveness review supports efficacy of certain antipsychotics for dementia and anxiety disorder, but prescribing of drugs without supporting evidence continues in practice. For example, while aripiprazol, olanzapine and risperidone were found to have small but significant benefits for dementia symptoms, this analysis showed quetiapine was most prescribed in this population; haloperidol was prescribed more than twice as often as aripiprazole. **CONCLUSIONS:** In spite of the clinical findings, this analysis found growing use of antipsychotic medications in the elderly population and prescribing of specific drugs in the absence of supporting evidence.

PHP89

KOREAN RECOMMENDATIONS ON HEALTH ECONOMIC EVALUATION (2ND AND UPDATED VERSION)

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OBJECTIVES: Korea's Health Insurance Review and Assessment Service (HIRA) has been in charge of updating economic evaluation (EE) guideline. The purpose of this study is to provide minimum standards for submissions, thus increase the comparability between submissions and help decision makers to reach consistent reimbursement decisions. **METHODS:** To prioritize the topics of EE guideline revision, HIRA has reviewed foreign EE guidelines focusing on currently updated topics, and evaluated practical and theoretical needs for updating those topics. Gaps between current recommendations and domestic practice patterns were assessed by evaluating dossiers submitted to HIRA for reimbursement decision. In addition, survey results from pharmaceutical companies as well as decision makers regarding current guideline were considered. In developing current revision, experts meetings were held 6 times, and working group meetings with pharmaceutical companies were held 4 times to reach as much consensus as possible. **RESULTS:** Current EE recommendations are in line with most of foreign EE guidelines, yet the gap between current recommendations and domestic reality emerged due to lack of high quality domestic data. Some vague expressions have been noted. To reduce confusion, we clarified the level of data requirement (must, should, preferred) based on data availability and strength of the evidence. We stipulate QALY measurement, modeling methods, sensitivity analysis, and perspective in this revision. Minor updates were also included. **CONCLUSIONS:** Current revision strives to reduce comparability and consequently, enhance comparability among submissions by providing concrete recommendations.

HEALTH CARE USE & POLICY STUDIES – Quality of Care

PHP90

CASE-MIX ADJUSTMENT OF ADHERENCE-BASED PHARMACY QUALITY INDICATOR SCORES

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OBJECTIVES: To evaluate three different methods to compute risk-adjusted pharmacy performance scores based on adherence-based pharmacy quality indicators. **METHODS:** This retrospective cohort study used the 2007 Mississippi Medicare administrative claims dataset. Patient medication adherence was assessed using the proportion of days covered (PDC) measures proposed by the Pharmacy Quality Alliance for seven therapeutic classes of medications. Pharmacy performance scores were computed for all pharmacies serving Medicare beneficiaries in the state. Risk-adjusted pharmacy performance scores were computed using a classical logistic regression model (Method 1), a hierarchical random effects model (Method 2) and the shrinkage estimators of the random-effects model (Method 3). Patient demographics, income subsidy status, and co-morbidity burden were used as variables for risk adjustment. The agreement in classification of pharmacies based on unadjusted and adjusted scores was measured using Cohen's kappa coefficient. **RESULTS:** The logistic regression model and the random-effects model displayed good predictive ability (c-statistic>0.7) for all therapeutic classes. The residual intraclass correlation coefficient ranged from 0.008 to 0.012 indicating that although pharmacy-level factors may have a significant impact, they are not as important as patient-level factors in determining adherence. Higher levels of agreement were observed between pharmacy classifications based on unadjusted scores and risk-adjusted scores obtained from Methods 1 and 2 (0.5<kappa<0.74) with the percentage change in classification ranging from 16.3%-28.4%. Scores based on Method 3 produced fewer outliers and showed minimal agreement with unadjusted scores (0.19<kappa<0.35). When compared to risk-adjusted scores, unadjusted scores classified 8-12% of the low performing pharmacies as high performing and classified 20-30% of the pharmacies in the top 20% as low performers. **CONCLUSIONS:** Risk-adjusted scores produced more robust indicators of pharmacy quality than unadjusted scores. Not adequately addressing the effects of patient case-mix while measuring quality could have severe implications if these measures are used for pay for performance programs or generating quality report cards.

PHP91

FACTORS AFFECTING SERUM POTASSIUM MEASUREMENTS AFTER INITIATION OF SPIRONOLACTONE AT AN ACADEMIC MEDICAL CENTER

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OBJECTIVES: Serum potassium levels should be assessed periodically following the initiation of spironolactone treatment. This study examined the rate of laboratory follow-up and factors affecting it at an academic medical center. **METHODS:** Adult patients starting spironolactone treatment between January 1, 2008 and September 30, 2010 were studied. Subjects were excluded if the indicated disease was not followed up at the medical center, or the exact date of the first spironolactone prescription was unknown. Data were collected by computer query and chart review. Survival analysis examined the factors predicting the time to first serum potassium testing after spironolactone initiation. **RESULTS:** A total of 161 patients were included (mean age 51.1 years, 57% female), 29% of whom had some renal impairment (creatinine clearance <60 ml/min). Spironolactone was most commonly used for ascites/edema due to primary liver disease (45.3%), followed by congestive heart failure (19.3%) and polycystic ovary syndrome or other hormone-related disorders (18.6%). The median time to first potassium test was 22 days. After adjusting for age, gender, renal function and insurance status, medical indication was the only factor impacting time to first potassium check-up. Compared to patients with primary liver disease, patients who used spironolactone for ascites/edema not due to hepatic or cardiac causes (e.g., non-hepatic malignancy, nephrotic syndrome) were likely to have a potassium level checked earlier (hazard ratio [HR]=2.2, 95% CI=1.04-4.6), whereas potassium testing was more likely to be delayed in patients with hormone-related disorders (HR=0.4, 95% CI=0.2-0.9) or hypertension (HR=0.4, 95% CI=0.2-0.8). **CONCLUSIONS:** Medical indication was significantly predictive of the time to first potassium check in patients receiving spironolactone. It is surprising that renal dysfunction was not a factor, while the association with indication has many possible explanations from increased routine lab testing for some indications and higher risks of hyperkalemia complications. Further studies are needed to validate and understand these data.

PHP92

APPLYING ACTUARIAL METHODOLOGY TO HOSPTIAL DATA FOR ESTIMATION OF MEDICAL ERRORS

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OBJECTIVES: Medical errors cause approximately 44,000 to 98,000 injuries annually in the United States (US). This study estimated the occurrence of medical errors and associated costs using actuarial methodology developed by Milliman, Inc. applied to Premier hospital data. **METHODS:** The Milliman study utilized an expert panel to estimate how often medical injuries were likely to be associated with a medical error rather than the underlying disease. Injuries were classified into five groups based on the likelihood that they were associated with a medical error. The midpoint of each range of likelihood of medical error was applied to the frequency of each medical injury to establish the rate of medical error. This study utilized Milliman's ranges and midpoints applied to Premier data. Injury rates, error estimates and cost-per-error estimates were developed from Premier 2008-2009 data. A visit qualified as an injury visit if >1 of 97 injury groupings identified by Milliman occurred. Non-injury control groups were established using propensity score matching. Population estimates were projected from Premier to all US acute care hospitals. **RESULTS:** While the focus of the earlier report was health plan claims data, this study utilized hospital billing records to demonstrate direct cost of medical errors to hospitals. The rates of medical errors were similar to the Milliman study and both studies found pressure ulcers and postoperative infection were the most common types of medical errors. Milliman estimated the total cost of medical errors to be approximately $17 billion in 2008. This analysis found that hospitals bear approximately 1 billion in costs related to medical errors. **CONCLUSIONS:** Utilizing methods developed by Milliman, this study estimated the rates and cost of medical errors to hospitals utilizing hospital billing data, revealing similar patterns of errors.

HEALTH CARE USE & POLICY STUDIES – Regulation of Health Care Sector

PHP93

IMPACT OF PRESCRIPTION MONITORING PROGRAMS ON PHARMACISTS' CONTROLLED SUBSTANCE DISPENSING BEHAVIOR

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OBJECTIVES: Prescription drug monitoring programs (PDMPs) are viewed as a tool to reduce abuse and diversion of prescription controlled substances (CS), although little is known about their effectiveness in achieving these goals. The purpose of this project was to assess the impact of the Kentucky All Schedule Prescription Electronic Reporting program (KASPER) on pharmacists' dispensing behavior and to evaluate its perceived effectiveness in reducing drug abuse, diversion, and doctor shopping. **METHODS:** Surveys were mailed to 2,018 pharmacists in Kentucky. After two weeks, a reminder postcard and second survey were sent to non-responders. Responses were coded and descriptive analysis was conducted in STATA 11. **RESULTS:** Responses were received from 575 pharmacists (response rate = 28.5%). The majority (77%) indicated they had requested a patient's CS history through KASPER. For those who had not utilized KASPER, the primary reason was lack of Internet access at the practice-site. When asked if their CS dispensing has changed since KASPER implementation, 67% indicated no change while 13% indicated a decrease in dispensing and 15% indicated an increase. For those reporting a decrease, reasons cited include implementation of KASPER (36%), increased law enforcement activity (15%) and media coverage of drug abuse and diversion (8%). The majority (83%) of respondents believe that KASPER is an effective tool to reduce drug abuse and diversion and 79% feel it is an effective tool to reduce doctor shopping. **CONCLUSIONS:** Internet access was the primary reason for not using KASPER. Most pharmacists have not perceived a change in CS dispensing since