population with asthma. RESULTS: We found 18 articles that met the inclusion criteria; three were validation studies and the remaining were observational studies or clinical trials. All three domains of the SGRQ are internally consistent and reliable with ICC of at least 0.70 for individual domains and greater than 0.90 for total score. Convergent and discriminant validity were seen with two of three domains and dyspnea grade, six-minute walk distance, and other HRQoL instruments. Face and content validity were demonstrated. SGRQ was able to discriminate between patients with varying levels of symptoms, FEV1, self-reported healthcare utilization services, asthma control problems, and HRQoL. Responsiveness to change, however, is not well-established for SGRQ despite a reported minimally important difference of 3.9-unit change, which may be due partly to a paucity of studies using SGRQ in this population. CONCLUSIONS: Our findings suggest SGRQ has face, content, and construct validity. It is able to discriminate between different groups of asthma patients, and may be useful in facilitating asthma resource allocation. Further research is needed to determine its responsiveness to change.

**PAS11**
**PROPRIETY SCORE MATCHING WITH MORE THAN TWO CATEGORIES**
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OBJECTIVE: We applied the extension of propensity score methodology that allows for estimation of average causal effects with multi-valued treatment. METHODS: The methodology requires three steps: 1. Estimating propensity score with multinomial or nested logit 2. Estimating the conditional expectation and 3. estimate average respond treatment by calculating average of conditional expectation averaged over the distribution of the pre-treatment variables. RESULTS: The Market Scan private insurance data base was used in this study which based upon asthma individuals whose health care was provided under a variety of fee-for-service (FFS), fully capitated and partially capitated health plans, including exclusive provider organizations, indemnity plans. Treatment is divided into three categories: a) controller only; b) reliever only; and c) reliever and controller. These three categories is matched with control group using multinomial logit. Pre-period demographic and clinical factors are used as a covariate. Conditional expectations are calculated and applied as a weight to estimate average treatment effect among asthma patients. Reliever and Controller patients have the highest treatment effect whereas controller only patients have the lowest effect. CONCLUSION: Multi-valued treatment is common in pharmaco-econometric research and extension of propensity score matching to cover multi-valued treatment is straightforward and easy to apply.

**PAS12**
**TREATMENT PERSISTENCE AND COMPLIANCE WITH MEDICATIONS FOR ASTHMA AND CHRONIC OBSTRUCTIVE PULMONARY DISEASE**
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OBJECTIVE: To assess the patterns of persistence with various classes of inhaled medications (i.e., beta agonist, anticholinergic, and glucocorticoid) medications used to treat asthma and chronic obstructive pulmonary disease (COPD). METHODS: Pharmacy claims data were analyzed for persistence with inhaled treatment (time to discontinuation) using a 60-day gap to define discontinuation. Compliance, defined as the percentage of days with doses available divided by days to last refill, also was assessed. Patients were grouped as naive (no inhaled medication in the previous year) or experienced (previous or current treatment), and by age (18–65, 65+ years). Medications included: ipratropium, ipratropium + salbutamol, formoterol, formoterol + budesonide, salmeterol, salmeterol + fluticasone, and tiotropium. RESULTS: The database included 31,368 patients prescribed one of these medications (4,888 naive, 26,480 experienced). Based on a 60-day lapse in refill, only 15–63% of patients continued on the index drug for more than 6 months, further decreasing to 7–53% at 12 months, and 5–47% at 18 months. At 12 months, patients taking tiotropium had significantly longer persistence rates compared to that for other drugs (53% versus 7–30%, all p < 0.0001), and fewer switches to alternative medications. Naive patients had significantly shorter treatment persistence than experienced patients for all drugs (all p < 0.0001), including tiotropium (27% versus 55%, p < 0.0001). Compliance rates were similar for all drugs (i.e., 76%–94%) but highest for tiotropium. CONCLUSIONS: These data demonstrated that 1) persistence with inhaled treatment for asthma and COPD was low overall (despite the generous 60-day allowance to refill), but patients stayed on treatment with tiotropium significantly longer than with other medications, and 2) patients naive to these classes of inhaled treatment had shorter treatment persistence than experienced patients.

**PAS13**
**ASSOCIATION OF MEDICATION ADHERENCE WITH WORKPLACE PRODUCTIVITY AND HEALTH-RELATED QUALITY OF LIFE IN PATIENTS WITH ASTHMA**
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Asthma is a chronic inflammatory disorder of the lungs and has a significant impact on morbidity, mortality, and health-related quality of life (HRQL). Asthma also impacts indirect costs resulting from losses in workplace productivity. OBJECTIVE: To examine the association of medication adherence with workplace productivity and HRQL in patients with asthma in a state health insurance program. METHODS: The diagnosis of asthma was identified from medical claims data of state employees between 18 and 65 years of age who obtained healthcare benefits from a state health insurance program from July 2001 through June 2003. A three-part survey was mailed to these patients to measure HRQL, workplace productivity, (absenteeism [time lost from work] and presenteeism [reduced productivity at work]), and self-reported medication adherence. The survey consisted of the St. George’s Respiratory Questionnaire, the Workplace Productivity Short Inventory, and the Morisky Adherence Scale. Productivity losses were translated into dollar values by using previously published metrics (employer perspective). The association between self-reported medication adherence and HRQL and productivity was measured using multivariate regression analyses. RESULTS: The response rate was 25.1% (385/1493). The mean HRQL total summary score was 33.2 ± 19.9 units, with the symptoms domain having the worst HRQL scores (49.3 ± 21.4 units), followed by the activity (39.6 ± 26.6) and impacts (24.6 ± 19.1) domains. 39% of the participants reported themselves as “high” adherent, 19% reported themselves as “medium” adherent, and 42% as “low” adherent. Asthma resulted in productivity losses of $597 ± $1024 (absenteeism)
and $658 ± $1808 (presenteeism) per enrollee per year. Morisky-based adherence was not a significant predictor of HRQOL or productivity in the multivariate models. CONCLUSIONS: Asthma was associated with HRQOL detriments and workplace productivity losses. Medication adherence continues to be a problem among asthma patients.

CANCER—Clinical Outcomes Studies

ESTIMATING THE EFFECTIVENESS OF EARLY-STAGE LUNG CANCER ADJUVANT TREATMENTS IN PRACTICE USING INSTRUMENTAL VARIABLE METHODS

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OBJECTIVES: Recent randomized controlled trials demonstrated the efficacy of adjuvant chemotherapy for certain patients with early-stage lung cancer (Winton et al. NEJM 2005) while the efficacy of adjuvant radiation therapy hasn’t been determined in clinical trials for these patients. Both treatments have been used in practice for years and it isn’t clear whether patient survival benefits are available by expanding treatment rates. OBJECTIVE: estimate the effectiveness of these treatments in practice, assess whether survival benefits are available from expanding treatment rates. It has been suggested that instrumental variable estimates on observational data provide such an interpretation (McClellan et al. JAMA, 1994). METHODS: Apply instrumental variable (IV) methods to 7614 early-stage lung cancer patients that received surgery from the SEER-Medicare databases (1991–1999) to assess the effectiveness of each adjuvant treatment. Instruments included area-level Herfindahl indices of patient concentration across providers and area-level treatment rates across time. Covariates included stage, grade, tumor site, age, gender, and race. RESULTS: Using IV methods, we found that our instruments explained a statistically significant portion of the variation in adjuvant treatment use. Using the treatment variation stemming from the instruments, we found the adjuvant chemotherapy had a positive effect on three-year patient survival (p < 0.05) while adjuvant radiation therapy didn’t. Using standard risk-adjustment models leaving residual confounding in spite of controlling for measured covariates, both adjuvant chemotherapy and adjuvant radiation therapy had statistically significant negative relationships with three-year patient survival (p < 0.05). CONCLUSION: Using IV methods provides estimates of effects of treatments in practice, suggesting survival rates would increase if adjuvant chemotherapy rates increased for early-stage lung cancer patients. No survival gains appear available from expanding adjuvant radiation therapy rates. The IV results contrast the negative “treatment effects” in standard risk-adjustment models, suggesting that providers recommended adjuvant treatments to patients with higher unmeasured severity levels.

AN ANALYSIS OF OUTPATIENT SERVICE UTILIZATION FOR DELAYED NAUSEA AND VOMITING USING ELECTRONIC MEDICAL RECORDS

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OBJECTIVES: Delayed chemotherapy-induced nausea and vomiting (CINV) can increase healthcare utilization and decrease patient quality of life. While reports of delayed CINV range from 40–60% with moderately to highly emetogenic regimens, little information is available on utilization of care as a result. To determine the frequency of outpatient service utilization associated with CINV between 24–120 hours following chemotherapy administration during cycles 1–5. METHODS: A retrospective observational design of US Oncology nation-wide iKnowMed electronic medical records (EMR) was employed. The cohort for analysis included patients from four practices in separate states receiving chemotherapy between August 2004 and April 2005. Chemotherapy regimens included one or more of the following five drugs: carboplatin, cisplatin, oxaliplatin, doxorubicin, cyclophosphamide. Failure was defined as one or more of the following events between 24–120 hours following chemotherapy: phone encounters with documentation of CINV; non-chemotherapy office visits for hydration, IV anti-emetic administration, and/or documentation of CINV; oral anti-emetic orders between 24–120 hours. RESULTS: A total of 691 patients were identified as receiving target chemotherapy during cycles 1–5. Mean (std) age was 61 (13) years, and 62% were female. Twenty-six percent had breast cancer, 26% lung, 10% colorectal, and 8% lymphoma. In cycle 1, the rate of failure was 6.7%; in cycle 2, 5.9%; in cycle 3, 5%; in cycle 4, 5.3%; and in cycle 5, 4.0%. All patients received one or more IV anti-emetic on Day 1 of each cycle. CONCLUSION: The rates reported in this cohort of patients from a nation-wide EMR database indicate that while many patients may experience some degree of CINV during days 2–5 of chemotherapy, only a small percentage receive outpatient clinic care as a result.

EFFECTIVENESS OF A COMMUNITY—BASED PROSTATE CANCER EDUCATION KIOSK FOR AFRICAN AMERICAN MEN: ANALYSES OF COST, SATISFACTION, QUALITY, KNOWLEDGE, AND INTENTION VARIABLES

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OBJECTIVES: The Healthy People 2010 goal for the nation concerning prostate cancer is to reduce prostate cancer death rate to 28.8 deaths per 100,000 males by 2010. The reported death rate for African-American men in 2002 was 62.0 per 100,000 males and for Caucasian men 25.7 per 100,000 males. Based on this statistic, Caucasian men already fare better than the projected goal for 2010 while African American (AA) men have a long way to go to achieve this goal. Prostate cancer education and awareness is very important to eliminate the disparities experienced by AA men. Thus, the purpose of this study is to evaluate the effectiveness of the prostate cancer education kiosk (PCEK). METHODS: Participants were adult AA who are employees of an HBCU institution. A structured survey instrument assessing participants’ demographics and prostate cancer knowledge was employed for the study. Data collection involved three steps: 1) completion of survey before use of kiosk [pre-test], 2) use of kiosk by participants [post-test], and 3) completion of survey after use of kiosk [post-test]. RESULTS: Of the 100 participants, most were men (78%), single (53%), had at least a college degree (52%), and between 40–49 years (58%). Men’s score on both the pre-test and post-test knowledge scores were higher than women. PCEK was found to significantly improve participants’ knowledge. The post-test knowledge score of participants (89.42%) was higher than the pre-test knowledge score of participants (67.92%). CONCLUSION: PCEK offers an effective method to educate AA men about prostate cancer. Future studies should explore the cost-effectiveness of touch screen computers such as PCEK in educating the AA community on diverse health issues.