Acting Opioid (LAO) medication for chronic pain management. The LAOs considered were transdermal fentanyl (TF), controlled release morphine sulfate (CRMS) and controlled release oxycodone (CRO). METHODS: Medicaid beneficiaries from three states during 1999–2000 were studied. Patients were followed for at least one year, starting with their first LAO prescription in 1999. Patients who did not have a LAO in the six months prior to that index date were labeled “incident”, while patients with a history of LAO use were labeled as “prevalent”. Patients were then grouped by the opioid they received on the index date. Disease-type, demographics, health status, health care utilization, and expenditures were measured and compared among the three LAO cohorts. LAO costs and total annual health care expenditures by LAO cohort were compared using descriptive and multivariate analyses, for the incident and prevalent patient samples. RESULTS: Descriptive results indicate that incident (I) and prevalent (P) LAO annual cost for CRO ($1361 I; $4146 P) were significantly higher than costs observed for TF ($1202 I; $3061 P) or CRMS ($919 I; $3572 P) (p < 0.01). After controlling for confounding characteristics, total annual health expenditures in the CRO incidence sample were similar to the CRMS sample. However, total annual health care expenditures for the CRO population were significantly lower than expenditures for the TF population, with an annual cost savings of about $960 (p < 0.01). Economic differences were not noted among the prevalent LAO populations. CONCLUSIONS: Total cost, not just pharmaceutical costs, should be considered when making policy decisions about insurance coverage for LAO drugs. In the incident sample, patients on TF cost about $960 more per year (p < 0.01), on average, compared to similar CRMS and CRO patients.

AN OPIATE RENEWAL CLINIC: A COST EFFECTIVE APPROACH TO REDUCING UNSCHEDULED PATIENT VISITS

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OBJECTIVES: The number of patients on opiates for chronic non-malignant pain continues to grow. With an emphasis on treating pain, opioid medication is being used more often. Following patients in a Primary care clinic has become more difficult because of the increased time required to manage and assess medication effects and the large number of unscheduled walk-in visits. Our objectives were to reduce unscheduled walk-in visits, reduce substance abuse, and diversion. METHODS: We established a multidisciplinary opiate renewal clinic that meets once a week and sees between 20–50 patients in a group education setting. A thirty minute educational presentation is made each session; all patients undergo urine drug testing and blood work. Patients who are negative for prescribed medication receive a one month renewal of medication. Patients who have street drugs present are referred for Substance abuse counseling and given a one week renewal. Patients who are impaired do not receive medication and appropriate referral is made. Patients who are compliant may receive a one month renewal and face-to-face visits every two months. RESULTS: Unscheduled walk-in visits decreased by 76%. Referrals for substance abuse treatment increased by 100%. It was previously difficult to diagnose substance abuse without drug testing. Approximately 32% of patients had positive urine for marijuana, cocaine or both. CONCLUSIONS: An opiate renewal clinic for patients with chronic non-malignant pain and substance abuse can be a cost effective approach to management.

PAIN

PAIN—QUALITY OF LIFE STUDIES

PPN5

RELATIONSHIP BETWEEN PAIN AND PERCEIVED HEALTH STATUS IN OLDER PERSONS WITH POST-HERPETIC NEURALGIA

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OBJECTIVE: Post-herpetic neuralgia (PHN, persistent pain following “shingles”) is common, especially among older persons. The pain often lasts well beyond the acute episode, occasionally lasting for several years. This study explored the impact of chronic pain on perceived health status in patients with PHN. METHODS: This was a community-based survey where persons aged ≥65 years with PHN were recruited via advertisements in 24 large US newspapers. Eligible subjects were sent a questionnaire to complete, which included items concerning PHN pain intensity in the prior week (current, average, worse, least), the EQ-5D, and a 100-point global health rating scale. RESULTS: A total of 385 persons participated in the study; 61% were age ≥75 years. Mean (±SD) current, average, worst, and least pain due to PHN was 4.0 (±2.7), 4.6 (±2.1), 6.0 (±2.4), and 2.9 (±2.3) respectively. Mean values for the EQ-5D weighted health index and the global health rating scale were 0.61 (±0.26) and 65.7 (±21.1). There was a strong relationship between pain intensity and overall health rating. Subjects with “mild” worst pain (range: 0–4) had a mean health rating of 73.8 (±17.5), while those with “moderate” (range: 4–7) or “severe” (range: 7–10) worst pain had mean values of 63.2 (±21.0) and 60.5 (±22.6) respectively. Similar results were obtained for other measures of pain intensity. The EQ-5D weighted health index varied in a similar fashion in relation to pain intensity. Subjects with “mild” average pain had a mean EQ-5D weighted health index score of 0.69 (±0.17) while those with “moderate” or “severe” average pain had mean values of 0.58 (±0.27) and 0.25 (±0.31) respectively. CONCLUSIONS: Pain intensity due to PHN is substantial and has a profound impact on self-reported health.

PAIN

PAIN—HEALTH POLICY STUDIES

PPN6

TRENDS IN MEDICAL USE AND ABUSE OF SUSTAINED-RELEASE OPIOID ANALGESICS: A REVISIT

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OBJECTIVES: Previous literature suggests that increases in the medical use of opioids over the early 1990s did not contribute to increased morbidity secondary to opioid abuse. Our objective was to evaluate the period 1997–2001 to analyze trends in medical use and medical abuse of three classes of opioid analgesics that are commonly used in sustained-release formulations: fentanyl, morphine, and oxycodone. METHODS: A retrospective analysis of the Drug Abuse Warning Network (DAWN) database and the Automation of Reports and Consolidation Order System (ARCOS) database for the years 1997–2001 was used for this study. RESULTS: The analysis of the DAWN database showed that there was an 83.5% increase in all opioid analgesic mentions from 1997 to 2001. Mentions involving any fentanyl compound increased 249.8%, any morphine compound
increased 161.8%, and any oxycodone-containing compound increased 267.3%. Mentions of each of these three classes of opioids remained less than 2% of all total drug mentions per year for each year studied. Medical use of the selected opioid classes, as reported in the ARCOS database and measured by grams distributed, all increased substantially (fentanyl 151.2%, morphine 48.8%, oxycodone 347.9%). CONCLUSIONS: Using this method of analysis, the rates of drug abuse, and resultant morbidity secondary to the use of opioid analgesics, remains low in spite of the increase in medical use of these substances.

**PPN8**

**PATTERNS AND TRENDS IN OPIOID USE AMONG INDIVIDUALS WITH BACK PAIN IN THE UNITED STATES**

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Secondary analysis of the Medical Expenditure Panel Survey (MEPS) from 1996 to 1999. OBJECTIVE: To examine patterns in opioid use in 1996, 1997, 1998 and 1999 among individuals with back pain in the US, and to investigate trends in the use of overall and individual opioid category. No study has examined at a national level the patterns and trends of opioid use among individuals with back pain. METHODS: Individuals with back pain were stratified by socio-demographic characteristics and geographical regions. Rates of overall opioid use were compared among different strata. To investigate trends in opioid use, use rates of the overall and individual opioid category were calculated and compared. From 1996 to 1999, the use of opioid was not significantly different across different gender or racial/ethnic groups, but significantly higher among individuals who were publicly insured, had low or below low income and had education at or below 12th grade compared to their respective counterparts. During the 4-year period, significant variations in opioid use across different age groups or geographic regions were observed in early years. But the variations became non-significant in later years. RESULTS: Trend analysis indicated that the rates of overall opioid use increased slightly across the 4-year span. Among individual opioid categories, the use of oxycodone or hydrocodone increased whereas the use of propoxyphene decreased. CONCLUSIONS: The significantly higher use of opioids among individuals who were publicly insured, had low or below low income and had education at or below 12th grade raised serious concerns about drug safety in this patient population. The increase in the use of hydrocodone and oxycodone indicated a need to better assess the efficacy and safety associated with these drugs among individuals with back pain.

**PPN9**

**PRESCRIPTION OF NON-STEROIDAL ANTI-INFLAMMATORY DRUGS AND MUSCLE RELAXANTS FOR BACK PAIN IN THE UNITED STATES**

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Secondary analysis of the 2000 Medical Expenditure Panel Survey (MEPS). OBJECTIVE: To examine national prescription patterns of non-steroidal anti-inflammatory drugs (NSAIDs) and muscle relaxants among individuals with back pain in the United States. Summary of Background Data. There is a lack of information on national prescription patterns of NSAIDs and muscle relaxants among individuals with back pain in the US. METHODS: Traditional NSAIDs, cyclooxygenase-2-specific (COX-2) inhibitors and muscle relaxants were investigated. Individuals with back pain were stratified by socio-demographic characteristics and geographical regions. For each medication category, overall prescribing frequency was compared across different strata and individual drug prescription was analyzed. RESULTS: Traditional NSAIDs, COX-2 inhibitors and muscle relaxants respectively accounted for 16.3%, 10% and 18.5% of total prescriptions for back pain in 2000. Among individual drugs, ibuprofen and naproxen accounted for most of the prescriptions for traditional NSAIDs (60%), whereas two-thirds of the prescriptions for muscle relaxants were attributable to cyclobenzaprine, carisoprodol and methocarbamol. Prescription of COX-2 inhibitors or muscle relaxants demonstrated wide variations across different regions. Several individual characteristics including age, race and educational level were associated with the prescription of some of the medications. CONCLUSIONS: Neither traditional NSAIDs, nor COX-2 inhibitors, nor muscle relaxants dominated prescriptions for back pain. However, a small number of individual drugs were attributable to most of the prescriptions for traditional NSAIDs or muscle relaxants. The prescription of some of the medications demonstrated wide variations across different regions or different racial and educational groups. More studies are needed to understand why the variations occurred and how to standardize the prescriptions.

**METHODS**

**METHODS—Cost Related Studies**

**COMPARISON OF GENERALIZED LINEAR MODELS AND ORDINARY LEAST-SQUARES REGRESSION FOR COST ESTIMATION**

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OBJECTIVES: To illustrate how use of generalized linear models to analyze health care cost data may provide a better distributional fit than commonly employed approaches (e.g., linear or log-linear ordinary least squares [OLS] regression), and could yield quantitatively and inferentially different conclusions. METHODS: Data were obtained from the PharMetrics Patient-Centric Database, which includes integrated medical pharmacy claims from 73 health plans nationwide. Patients with a diagnosis of intermittent claudication (ICD-9-CM 443.9x) who newly started cilostazol or pentoxifylline therapy between June 1999–March 2002 were selected for analysis. Six-month pre-treatment and follow-up periods were created in relation to the first observed prescription. Total costs of care during follow-up were estimated based on health plan payments for medications and services rendered, and were expressed in 2002 U.S. dollars. Alternative multivariate approaches to analyzing total costs were employed—an OLS model (log-linear) versus a generalized linear model (GLM) with a log-link function and a gamma distribution. Covariates included demographic and other baseline/pre-treatment variables. Histograms of untransformed and log-transformed costs were compared to gamma and normal distributions; goodness-of-fit assessments also were conducted. The results of OLS (on a log-transformed outcome) and gamma GLM models were compared. RESULTS: Analyses were conducted for 763 and 506 patients newly starting cilostazol and pentoxifylline therapy respectively. The results of goodness-of-fit testing (deviance: 1489.5 vs. 1366.4 for degrees of freedom = 1,255) indicated that the gamma GLM model approximated the cost distribution most closely. Observed annual mean total costs were $6238 and $5568 for cilostazol and pentoxifylline respectively; application of the two models yielded different results—a non-significant (p = 0.0620) treatment effect using log-linear OLS, and