system, which can lead to disparities in treatment. METHODS: Using nationally representative data from the Medicare Current Beneficiary Survey, 1992–2003 and the Medical Expenditure Panel Survey, 1999–2003, we estimated the out-of-pocket prices for common opioid analgesics among community-dwelling adults in the United States. Standardized gamma mixture models were estimated to predict out-of-pocket prices for individuals with and without drug coverage controlling for setting characteristics, such as year, as well as prescription specific attributes such as number of tablets and controlled release form.

RESULTS: Typical prescription for opioid analgesics costs a patient between $6.20 and $64.17, if they have drug coverage, and between $16.22 and $134.60 without coverage. CONCLUSION: A better understanding of the endogeneity of out-of-pocket prices not only improves our ability to identify the demand for health care, these models better characterize the financial burden of pain management.

COSTS AND COMORBIDITIES IN LOWER BACK PAIN PATIENTS USING NARCOTIC MEDICATIONS

Rhee Y1, Taitel MS2
1Northwestern University, Chicago, IL, USA, 2Matria Health care, Rosemont, IL, USA

OBJECTIVES: To identify lower back pain (LBP) patients who use narcotic medications and examine their medication behaviors, medical and pharmacy claim costs and associated comorbidities. METHODS: This study used medical and pharmacy claims data from 165,569 employees’ ages 18 to 64 years from three employer groups from September 2002 to December 2003. LBP patients were identified using ICD-9 diagnosis codes from medical claims data. Differences in costs and comorbidities were examined between LBP patients who use narcotic medications and LBP patients who do not use narcotic medications.

RESULTS: Among eligible members, 13,760 (8.3%) were identified as LBP patients. Nearly 60% were female with an average age of 46.8 years. Approximately half of the LBP patients (44.8%) used narcotic medications; however, they consumed 71% of total health care costs (medical plus pharmacy costs) among LBP patients. The average monthly total health care cost for a narcotic-using LBP patient was $1,040 versus $347 for a LBP patient without narcotics. Narcotic-using LBP patients had significantly (p < 0.001) higher rates of comorbid conditions than LBP patients without narcotic use: hypertension (22.9% vs. 13.3%), arthritis (14.1% vs. 4.3%), diabetes (10.4% vs. 5.6%), asthma (7.4% vs. 4.0%), coronary artery disease (5.0% vs. 2.5%), depression (10.3% vs. 5.4%) and anxiety (6.3% vs. 2.8%). Also, LBP patients with comorbid anxiety or depression on average used more narcotic medications than patients with other comorbidities. LBP patients who use narcotic medications are also more likely to visit the emergency room, use physical therapy or chiropractic services, utilize one or more epidurals and/or MRIs, or have a surgery (p < 0.001). CONCLUSION: Lower back pain patients who use narcotic medications are more likely to have additional health conditions and higher health care costs than non-narcotic using LBP patients. Further, patients with comorbid anxiety or depression take more narcotics than those with other comorbidities.

COSTS ATTRIBUTABLE TO INTRAVENOUS PATIENT CONTROLLED ANALGESIA: FOCUS ON DEVICE-RELATED EVENTS

Nelson WW1, Meissner BL1, Gagne JF2, Schein JR3
1Xcenda, Palm Harbor, FL, USA, 2Thomas Jefferson University, Philadelphia, PA, USA, 3Ortho-McNeil Janssen Scientific Affairs, LLC, Raritan, NJ, USA

OBJECTIVES: To estimate the costs of device-related events associated with intravenous patient-controlled analgesia (IV PCA) from the perspective of a hospital or integrated health-system. METHODS: To estimate the costs attributable to both harmful and non-harmful IV PCA device-related events, a quasi-cost accounting methodology is utilized. Data were obtained from the Manufacturer and User facility Device Experience (MAUDE) dataset, published literature, and expert opinions. The MAUDE dataset is publicly available, and contains mandatory FDA reports of medical device-related events. IV PCA event reports were identified from the MAUDE database (January 1, 2002-December 31, 2003) and the descriptive text was qualitatively reviewed to collect data on event consequences. The level of care rendered for the event consequences was estimated by applying clinical assumptions validated by an expert advisory panel. Both variable and opportunity costs (2006 values) were considered, including medication, laboratory, lost revenue, and labor. Whenever an event consequence was indicated in a report, the corresponding costs were applied to derive the estimated mean cost for each event type. The event types were previously defined and published (Device Safety Events, Operator Errors, Adverse Reactions to Opioids, Patient-related Events, and Indeterminate Events). RESULTS: The most costly event type was Adverse Reactions to Opioids, followed by Operator Errors (mean costs of $13,803 and $2,955 respectively). When stratified, events reported to be harmful to patients were associated with higher costs than non-harmful events: $3483 vs. $0 for Device Safety Events, $5756 vs. $361 for Operator Errors, $199 vs. $11 for Patient-related Events, and $6120 vs. $142 for Indeterminate Events; by definition, Adverse Reactions to Opioids were all harmful events. CONCLUSION: IV PCA device-related events are costly to hospitals due to their association with patient care consequence. This study provides an innovative approach to estimating the cost of device-related events. Additional research is necessary to validate these findings.

COSTS OF ERRORS ATTRIBUTABLE TO INTRAVENOUS PATIENT CONTROLLED ANALGESIA—FOCUS ON MEDICATION-RELATED ERRORS

Meissner BL1, Hicks RW2, Schein JR3, Sikirica V3
1Xcenda, Palm Harbor, FL, USA, 2US Pharmacopeia, Rockville, MD, USA, 3Ortho-McNeil Janssen Scientific Affairs, LLC, Raritan, NJ, USA

OBJECTIVES: The objective of this study was to estimate the frequency and cost of medication errors associated with intravenous patient-controlled analgesia (IV PCA) from the perspective of a hospital or integrated health-system. METHODS: This study utilized a quasi-cost accounting methodology to estimate the costs attributable to both harmful and non-harmful IV PCA errors. Data for the study were obtained from the MEDMARX® database, published literature, and expert opinions. MEDMARX is an anonymous error-reporting database maintained by the United States Pharmacopeia. The database accepts multiple inputs of error causes and error consequences per event (i.e., error cause and consequence categories not mutually exclusive). The level of care rendered was estimated by applying clinical assumptions (validated by an expert advisory panel) to each

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of the seven error consequence categories recorded in the MEDMARX dataset. Both variable and opportunity costs (2006 values) were considered, including medication, laboratory, lost revenue, and labor. When a particular consequence is indicated for an error report, the corresponding costs were applied to derive the estimated mean cost for each error cause. RESULTS: Between July 1, 2000 and June 30, 2005, 2356 records were identified as IV PCA errors. The most common error causes were human factors (79.3%) and equipment-related factors (25.1%). The overall mean cost was $733 per event, consisting of $241 in variable costs and $491 in opportunity costs. When stratified by error causes, errors associated with equipment-related and communication factors were the most expensive ($1189 and $1166). Greater than 10% of the errors resulted in patient harm and were overwhelmingly more costly than non-harmful events ($6621 versus $55). CONCLUSION: When accounting for the full impact of IV PCA errors, they are associated with high costs to hospitals. This study provides an innovative approach to estimating the cost of IV PCA medication errors. Additional research is necessary to validate these findings.

OBJECTIVES: To identify whether patients using Actiq, an oral lozenge formulation of the powerful opioid fentanyl, have any evidence of cancer according to administrative claims records. The Food and Drug Administration has approved Actiq for breakthrough cancer pain and patients without such a diagnosis should therefore be considered off-label. METHODS: Pharmacy claims spanning the dates 2002 until 2005 from two large Midwestern and Southern health plans were used to identify patients receiving at least one Actiq prescription according to National Drug Codes. All medical claims for these patients were then searched for any primary or benign cancer diagnosis to identify whether the population potentially qualified for use of the drug according to Food and Drug Administration labeling. RESULTS: Of 1,481 patients identified with Actiq, only 399 (26.9%) had any evidence of cancer. The remaining 1,082 patients (73.1%) potentially received Actiq in an off-label setting. By year, the ratio of on versus off-label users was essentially unchanged from 2002 through 2005. However, the total number of users identified by year doubled from 220 in 2002 to 439 in 2005. CONCLUSION: The majority of Actiq prescriptions may be off-label. Given that the drug is a powerful, habit-forming opioid, these data suggest that the use of this drug should be considered for specific utilization review by insurers. These data also track recent evidence indicating that the use of these drugs has increased rapidly in recent years. Future work should examine whether off-label use of Actiq may be related to patient copay or other benefit design characteristics.

OBJECTIVES: To examine family physicians’ attitudes and willingness to prescribe long-acting opioids to patients with moderate to severe chronic nonmalignant pain. METHODS: The Theory of Planned Behavior (TPB) was used to examine the underlying constructs (i.e., attitude, social influences, and perceived control) believed to influence physicians’ willingness to prescribe long-acting opioids for CNMP. Three focus groups were conducted and a web-based survey was developed, pretested, and e-mailed to 2750 Texas family physicians. A total of 64 Likert-type questions were used to assess the predictors of physicians’ willingness to prescribe, and 10 of these items measured physicians’ attitudes (summed range = 90 to 490). RESULTS: A total of 267 family physicians completed the questionnaire. The TPB model accounted for 39% (F(3222 = 47.4, p < 0.001) of the variance in explaining physicians’ willingness to prescribe. Most physicians (N = 179, 66%) indicated that they were willing to prescribe long-acting opioids to their CNMP patients. Physicians unwilling to prescribe long-acting opioids for CNMP had an overall unfavorable attitude (Mean = -7.87, SD = 17.43) compared to willing physicians (Mean = +9.56, SD = 17.42). Unwilling physicians held stronger beliefs that prescribing opioids would lead to patient abuse, addiction and regulatory scrutiny compared to willing physicians. A significant positive relationship was found between previous prescribing of long-acting opioids and attitude (R = 0.46, p < 0.01). Respondents who prescribed long-acting opioids more often were less likely to believe that it would lead to abusive and addictive behaviors, while those who prescribed less often were more likely to believe that it would lead to regulatory scrutiny. CONCLUSION: The TPB model was a significant predictor of physicians’