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Narcotic Drug Use Among Patients with Lower Back Pain in Employer Health Plans: A Retrospective Analysis of Risk Factors and Health Care Services

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Abstract

Objective: This study examines the risk factors of narcotic drug use, medical and pharmacy claim costs, and health services use among lower back pain (LBP) patients who use narcotic medications.

Methods: This retrospective study used administrative claims data between September 2002 and March 2004 from 3 employer health plans that collectively contained records of 165,569 employees 18 to 64 years of age. Multivariate regression analyses were performed to examine risk factors and health care services use consequences of narcotic drug use in patients with LBP.

Results: The study sample included 13,760 patients with LBP due to mechanical causes. Nearly 60% were female and the average age was 47 years. Almost half of the patients with LBP (45%) used narcotic drugs. Narcotic-using patients with LBP had significantly higher rates of comorbid conditions than patients with LBP not using narcotic drugs; hypertension (23% vs 13%), arthritis (14% vs 4%), depression (10% vs 5%), anxiety (6% vs 3%), and cancer (2% vs 1%) ($P < 0.001$). Patients with LBP with 2 identified psychological comorbid conditions, depression and anxiety, on average used more narcotic medications. Patients with LBP who had surgery were significantly more likely to use narcotic drugs within 1 week of procedure than those patients without surgery ($P < 0.001$). In contrast, patients with LBP who had chiropractic services for LBP were less likely to take narcotic drugs within 7 days after services compared to those without chiropractic services ($P < 0.001$). Furthermore, controlling for health conditions, patients with LBP who took narcotic medications were significantly more likely than patients not taking narcotics to have an emergency room visit within 30 days after the initial narcotic drug prescription dates ($P < 0.001$). Narcotic-using patients with LBP accounted for 62% of health care costs among all patients with LBP. The average monthly health care cost for a narcotic-using LBP patient was \$1222, compared to \$430 for a LBP patient not using narcotic drugs ($P < 0.001$).

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Conclusions: The subjects with LBP who used narcotic medications were more likely to have additional coexisting health conditions and used more health care services than nonusing patients with LBP ($P < 0.001$). Unadjusted health care services costs, including pharmacy claims costs, were significantly higher in patients with LBP using narcotic drugs than in nonusing patients with LBP ($P < 0.001$).

Keywords

narcotic drug use; comorbid conditions; lower back pain; emergency room visit

INTRODUCTION

Lower back pain (LBP) is the second most common neuromuscular abnormality among individuals aged 18 years and over in the United States.¹ Approximately 27% of US adults have experienced LBP at some point in the past 3 months.² The estimated total annual expenditures to treat LBP ranged from US \$20 to \$50 billion in 1998.^{3–5}

LBP is the second most common reason for sick leave among US workers after the common cold and also the leading cause of job-related disability.⁵ In the 1988 National Health Interview Survey, workers in high-risk industries collectively missed an estimated 101.8 million workdays due to back pain.⁶ Using the Workers' Compensation Provider data, the Washington State Bureau of Labor Statistics⁶ found that LBP was still a significant occupational problem in the United States, even though the rate of LBP claims decreased 34% from 1987 to 1995.⁷ This study reported that an estimated \$8.8 billion was spent on LBP medical claims and that 1.8 workers per 100 filed compensation claims related to LBP.⁷

Causes of LBP include anatomic/physiologic disorders, mechanical factors, and psychosocial factors.^{8,9} Comorbid conditions including headache, cardiovascular disease, respiratory disorders, asthma, depressive symptoms, and allergies are more common among patients with LBP than the general population.^{8,10–16} Hestbaek et al⁸ reported prevalence rates for headache (odds ratio [OR], 1.95; $P < 0.001$) and asthma (OR, 2.24; $P < 0.001$) that were significantly associated with the prevalence of LBP. Depression is also commonly reported in patients with LBP.^{11,12} In a systematic review study of 65 published articles from 1996 to 2002, on average, 65% of patients with depression experienced 1 or more pain episodes.¹⁷

In 1994, the Agency for HealthCare Research and Quality (AHRQ) developed a comprehensive educational guideline on how to assess and treat patients with LBP.^{18,19} That guideline asserted that clinicians should assess and monitor LBP for at least 4 weeks after the LBP episode. Pharmacologic interventions are generally recommended by AHRQ as the initial treatment of acute LBP. Common narcotic drugs used as part of the recommended pharmacotherapy for LBP include nonopioid analgesics, NSAIDs, and opioids. Other forms of treatment for acute LBP during or after pharmacotherapy include procedures to manipulate spinal points, spinal traction, or joint mobilization; electronic stimulation; exercises to help ease pain; and patient education (eg, methods for lifting heavy objects).^{9,18,19}

Patients with chronic LBP may require more aggressive treatments, such as epidurals, surgery, or both. Diagnostic tests, such as radiography, computed tomography, and magnetic resonance imaging (MRI), may be ordered to assist in clinical decision-making. Although >18% of all patients with LBP use chiropractic services,²⁰ there is currently no clear recommendation for best practices.¹⁸ Carey et al²¹ found that patients with LBP who received care from chiropractors were the most satisfied with perception of care, compared to patients who received care from orthopedic surgeons or primary care physicians.

The use of narcotic drugs, especially to treat patients with noncancer pain, has provoked debates concerning their efficacy, adverse effects, potential abuse, tolerance issues, and addictions.^{22,23} Particularly controversial is the use of long-term opioid therapy for chronic pain and its initiation in emergency departments (EDs) to control severe pain.^{23–26} Brown et al²⁶ encouraged chronic opioid analgesic treatment for severe chronic LBP that responded poorly to other treatments such as joint mobilization or spinal manipulation. However, physicians continue to either underuse or not prescribe opioids for management of severe pain due to safety concerns about opioid use like drug abuse and prejudice against certain racial/ethnic minorities who are presumably drug-seeking patients.^{24,25} Another concern with prescribing opioid treatment is the increased risk for opioid dependency or misuse, which could result in sanctions from state licensing.^{24,25}

The prevalence and cost of opioid use for LBP are significant. Almost half (48%) of the money spent on opioids was for LBP, compared with only 21% for cancer pain in 2001 among 17,148 LBP patients.²⁰ Patients with LBP are prescribed narcotic drugs in the primary care setting. Approximately 12% of patients with LBP who had short-term pain for <2 months and had good 52-week prognoses were prescribed narcotic drugs by their primary care physicians.²⁷ In a longitudinal observational study in 219 patients with LBP, it was found that 90% of patients with pain were taking pain medications, including narcotics, prior to their first visit for their pain to the primary care physician.²⁷

Those findings raise concerns regarding the proper use of narcotics in patients with LBP. To further our understanding of the current state of narcotic drug use among patients with LBP and the potential impact of narcotic drug use on health care resource utilization, the present study identified narcotic drug use and risk factors among patients with LBP resulting from mechanical causes. Risk factors included demographics such as age and sex, comorbid health conditions, and health care resource utilization. The association between narcotic use and subsequent ED visits and direct health care cost was analyzed.

MATERIALS AND METHODS

Data Collection

This study used medical and pharmacy claims data from the databases of 3 employer-provided health insurance plans. Combined, the databases contained records from 165,569 employees aged 18 to 64 years. File dates of claims submitted to the 3 plans were: company A, September 1, 2002, to March 31, 2003; company B, January 1, 2003, to December 31, 2003; and company C, April 1, 2003, to March 31, 2004.

To identify claims from LBP of mechanical causes, we used International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM)²⁸ codes for primary and secondary diagnoses and an algorithm developed at the University of Washington in Seattle.²⁹ Data from LBP caused by infection or accidental cause were excluded. The Current Procedure Terminology codes were not used for LBP classification.

Using *ICD-9-CM* and the University of Washington algorithm, 34 predesignated comorbid chronic conditions were identified. These comorbid conditions included cancer (all types), chronic obstructive pulmonary disease (COPD), arthritis, ulcer (peptic and pressure), diabetes, anxiety disorder, depression, asthma, hypertension, congestive heart failure (CHF), coronary artery disease (CAD), arrhythmia, osteoporosis, pregnancy, injury, and “other.” “Other” included genetic disease, seizure, dementia, otitis media, sickle cell disease, urinary tract infection, irritable bowel syndrome, and HIV.

Using procedure and point-of-service codes from medical claims data, this study identified service dates of and utilization of 6 health care resources: the ED, surgery, epidural, MRI, physical therapy, and chiropractic services. Total direct health care cost was calculated as the sum of paid amounts in medical claims and pharmacy claims during the study period. Costs of health care services for only LBP treatment were estimated using paid amounts indicated on medical claims. To determine narcotic use in patients with LBP, the National Drug Codes from Drug Information Framework volume 3.2³⁰ was used to review dispensation records from pharmacy claims. It was assumed that patients used the drugs that were dispensed.

Variables

We determined whether any of the following variables could be identified as risk factors for narcotic use in patients with LBP: age, sex, chronic comorbid condition, and prior health care resource utilization (within the 7 days before initial narcotic dispensation). For this purpose, patients were categorized into 3 groups based on age: 18 to <41, 41 to <56, and 56 to <65 years. Dichotomous variables (yes or no) were constructed to indicate the presence of the 34 chronic comorbid conditions and utilization of the 6 health care resources.

The mean number of narcotic prescriptions filled per patient for each chronic comorbid condition was calculated by dividing total narcotic drug use per comorbid condition by the number of patients with the comorbid condition. For example, 72 patients with LBP and CHF had prescriptions filled, for a total of 518 narcotic drugs. Therefore, on average, an LBP patient with CHF used 7.2 narcotic drugs.

Health care resources were considered utilized if the service was provided on the same date as the initial narcotic drug prescription date or within 7 days before the initial narcotic drug prescription date.

Two additional dichotomous variables (yes or no) were created to determine the association between narcotic drug use and subsequent ED visits, defined as those that occurred within 30 days after the initial date of narcotic prescription. For the second variable, history of hospitalization or ED visit was defined as that within the study period but with discharge dates prior to the initial narcotic prescription dates.

Statistical Analysis

Univariate analysis was conducted to examine the distributions of all variables. For bivariate analyses, 2-sided *t* tests were performed on continuous variables and χ^2 tests on categorical variables. Two multivariate logistic regressions were conducted. The first identified the risk factors associated with narcotic drug use in patients with LBP. The second examined the association between narcotic drug use and subsequent ED visits (within 30 days), controlling for age, comorbid disease, pregnancy, injury, prior hospitalizations, and ED visits. Colinearity among independent variables was tested. All data analyses were conducted at the patient level using SAS version 9.1 (SAS Institute Inc., Cary, North Carolina).

RESULTS

A total of 13,760 patients had LBP due to mechanical causes, and almost half of them (6171 patients; 45%) used narcotic drugs sometime during the study period. Table I presents demographics, comorbid diseases, and health care utilization among all patients with LBP and compares these characteristics between those who used and did not use narcotic drugs. Among all patients, 61% were female and the mean age was 47 years. There were no significant differences in age or sex between narcotic drug users and nonusers. The proportions of patients who had comorbid chronic diseases was significantly greater among narcotic drug users than

nonusers, including hypertension (23% vs 13%), arthritis (14% vs 4%), depression (10% vs 5%), anxiety (6% vs 3%), and cancer (2% vs 1%). With regard to health care resource utilization, 38% of patients with LBP used physical therapy services, 31% used chiropractic services, and 24% used the ED, with the proportions of narcotic drug users being significantly greater for each higher health care service except chiropractic.

Table II shows the mean number of prescriptions for narcotics among patients with LBP during the study period, by comorbid chronic condition. Mean prescriptions for narcotic drugs ranged from 3.6 in patients with diabetes to 7.2 in those with CHF. Mean prescriptions for narcotics in patients with LBP and the identified psychological comorbid conditions of anxiety and depression were 6.1 and 5.4, respectively.

Table III shows the results of the multivariate logistic regression that identified the risk factors for narcotic drug use in patients with LBP. Patients between 56 and <65 years of age were significantly less likely to use narcotics (OR, 0.8) than those between 18 and <41 years of age. Cancer (OR, 3.0), arthritis (OR, 3.0), COPD (OR, 2.3), ulcer (OR, 2.0), anxiety (OR, 1.6), diabetes (OR, 1.5), CHF (OR, 1.4), hypertension (OR, 1.4), depression (OR, 1.4), and asthma (OR, 1.4), all had independent, significant associations with the use of narcotic drugs. Patients who used surgery (OR, 18.7), epidural (OR, 4.3), MRI (OR, 4.0), and ED (OR, 2.6) were significantly more likely to have used a narcotic drug within 7 days, whereas those who used chiropractic services were less likely to use narcotic drugs than those who had not used chiropractic services (OR, 0.4).

Table IV shows the result of multivariate logistic regression of correlates for subsequent ED visits and the associated risk factors in patients with LBP. Controlling for the factors, patients who used narcotic drugs were significantly more likely to have had a subsequent ED visit (OR, 1.6). Other factors associated with the subsequent ED visits included injury (OR, 2.6) and previous hospitalizations or ED visits within the study period (OR, 2.4).

Table V presents the costs of health care utilization and pharmacy among all patients with LBP, by narcotic use. The total combined cost of health care utilization and pharmacy in those who used narcotic drugs (\$32,515,153) was significantly higher than that in patients who did not use narcotic drugs (\$19,902,778) ($P < 0.001$). All health care resource costs except chiropractic services were significantly higher among narcotic users than nonusers. The cost of surgery among users was 7% (\$2,115,413) of total costs, whereas in nonusers it was 1% of total cost (\$133,151). Although total pharmacy cost was significantly higher in users than nonusers (\$25,419,681 vs \$16,883,769; $P < 0.001$), the proportion of this cost was higher in nonusers (78% vs 85%; $P < 0.001$).

The mean monthly total health care costs per patient were significantly different between narcotic drug users and nonusers (\$1222 vs \$430; $P < 0.001$) and narcotic use was significantly associated with increased mean monthly costs (data not shown).

DISCUSSION

There are concerns regarding the proper use of narcotic drugs in patients with LBP. Using claims data from 3 large health plans, this study examined narcotic drug use and risk factors in these patients with LBP and the plausible impact of narcotic drug use on health care resource utilization and costs. The study found that 44.8% of patients with LBP used narcotic drugs and that users were more likely to have comorbid health conditions. The risk factors associated with narcotic drug use were comorbid disease, injury, and the psychological comorbid conditions depression and anxiety. Narcotic users had higher health care costs and more health care resource utilization. Subsequent ED visits also were significantly associated with narcotic drug use.

Previous studies have reported that a physical comorbid condition is associated with pain-related disease^{11,16,31} and that the prevalence of depression is higher in patients with chronic pain (5%–85%, depending on patients' health conditions^{11,17,32,33}) than in the healthy population. Depression may be a consequence of pain onset among patients with chronic pain¹¹ and has been reported to be a strong risk factor for neck pain and LBP (adjusted relative risk, 3.97; $P < 0.001$).³² Increasing depressive symptoms significantly predicted higher total health care cost for patients with LBP before adjustment (crude OR, 2.1; $P < 0.001$).³¹ In a prospective study in 1059 patients with LBP, Engel et al³¹ concluded that high health care utilization resulted from physical comorbidity, such as chronic disease, and they did not conclude direct causality between depressive symptoms and higher cost of health care resource utilization. Anxiety disorder has also been reported to be a strong comorbid condition associated with chronic spinal pain in the United States (OR, 2.0; $P < 0.05$).¹⁶

The finding that anxiety and depression were among the 6 most common conditions in narcotic users may highlight psychological factors in conjunction with physical factors regarding issues of narcotic drug use or opioid dependence among patients.^{22,23} Manchikanti et al³⁴ reported a significant association between psychopathology (depression, anxiety, somatization disorder) and substance abuse among patients with chronic pain, with proportions of opioid abuse and illicit drug use significantly higher in patients with depression versus those without it (12% vs 5%). The average numbers of narcotic drugs used among patients with comorbid anxiety and depression are high compared to several patients with other physical co-morbid conditions such as cancer, CAD, and hypertension, which demand control of pain due to the nature of the disease. These mean numbers of prescriptions for narcotics for subjects with 2 psychological comorbid conditions appeared high in this study.

Comorbid depressive conditions may be unrecognized and undertreated.^{14,35} Physicians and other health care providers should carefully assess depressive symptoms in patients with LBP and comorbid conditions and prescribe appropriate treatments for depression, such as psychotherapy.

Patients with LBP who received chiropractic services were less likely to use narcotic drugs. Chiropractic care appears to be a substitute treatment to pain medication and other health care services in patients with LBP due to the different sequence of services for pain treatment without physicians' prescriptions, yet there is no established standard treatment guideline for this path as for narcotic treatment. In addition, chiropractors do not have licensure to prescribe narcotic drugs.

In this study, patients who received physical therapy used more narcotic drugs. In a retrospective study by Vogt et al²⁰ in 17,148 patients with LBP, patients who received either physical therapy or chiropractic treatments were significantly less likely to use opioids. Vogt et al limited their study to the use of opioids, which might be the reason for somewhat different results found in this study.

Patients with LBP who used narcotic drugs were more likely to have a subsequent ED visit. Although it was beyond the scope of this study to examine the reasons for this, our finding raises a concern regarding the safety of these drugs and the importance of ensuring their appropriate use. Previous studies have found that inappropriate use of narcotic drugs, such as overuse or abuse, is a significant risk factor for adverse health events and injuries.^{35,36} It is also possible that more ED visits were related to a greater intensity of pain and disability.

Initiation of treatment with narcotic drugs and opioids occurs in ED visits. National statistics show that 50% of all patients who had an ED visit due to severe pain were prescribed narcotic drugs during the visit.¹ Proper use of narcotics and careful monitoring of prescription narcotic drug use in EDs are pertinent to avoid potential abuse or adverse events of narcotic drugs. On

the other hand, appropriate opioid therapy is warranted in patients with more severe pain.^{24–26}

Despite the difficulty addressing direct causality between narcotic drug use and higher health care cost and higher health care services use compared with nonuse found in this study, it is clear that narcotic drug use was associated with higher cost. Patients with LBP using narcotic drugs were more likely to use more expensive health care services, such as ED visits and surgery.

These findings led us to recommend precise assessment of patients with LBP-related comorbid conditions, particularly psychological comorbidities, and cautious monitoring of prescribing narcotic drugs in patients with LBP in primary care and EDs.

Study Limitations

This study had limitations. Each dataset from the health plans was limited to no more than 1 year of medical and pharmacy claims data. It was therefore not possible to identify newly diagnosed LBP or recurrent chronic LBP together with previous narcotic drug use or lifetime narcotic drug use in patients with LBR. Due to the use of administrative claims data in this study, no additional information was available, including out-of-pocket costs or self-treatment behaviors, such as heating pads and over-the-counter pain medicine. Claims data on the prescription of narcotic drugs also did not specify the unit dose or the duration of the prescriptions. Finally, because our study sample included enrollees from 3 health plans from different time periods, our results were not generalizable to other populations.

Because the sample size was large, it had an effect on the statistical significance of the findings. We observed statistically significant differences in some of the parameters (eg, cancer rates) between narcotic drug users and nonusers in which the point estimates were small. However, these differences may not be clinically relevant.

CONCLUSIONS

In these patients with LBP, those who used narcotic medications were more likely to have coexisting chronic comorbid conditions and health care resource utilization. LBP was also associated with psychological comorbid conditions, such as anxiety and depression, and patients with these conditions were more likely to use narcotic drugs.

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Table 1

Demographic characteristics, chronic comorbid conditions, and health care resource utilization of patients with lower back pain using and not using narcotics. Values are % of patients.

Parameter	Narcotic Users (n = 6171)	Narcotic Nonusers (n = 7589)	All Patients (N = 13,760)	P*
Age group				
18-<41 y	27	30	29	<0.001
41-<56 y	50	48	49	0.022
56-<65 y	23	22	23	0.118
Female sex	61	59	60	0.080
Comorbid condition [†]				
Hypertension	23	13	18	<0.001
Arthritis	14	4	9	<0.001
Diabetes	10	6	8	<0.001
Depression	10	5	8	<0.001
Asthma	7	4	6	<0.001
Anxiety disorder	6	3	4	<0.001
Coronary artery disease	5	2	4	<0.001
Chronic obstructive pulmonary disease	3	1	2	<0.001
Arrhythmia	2	1	2	<0.001
Cancer	2	1	1	<0.001
Osteoporosis [‡]	1	1	1	0.002
Congestive heart failure	1	0	1	<0.001
Ulcer	1	0	1	<0.001
Other [§]	10	5	7	<0.001
Injury	30	18	24	<0.001
Pregnancy	2	1	1	0.023
Health care resource utilization				
Physical therapy	40	35	38	<0.001
Emergency department	36	15	24	<0.001
MRI	31	13	21	<0.001
Chiropractic services	21	39	31	<0.001
Epidural	20	6	12	<0.001
Surgery	8	1	4	<0.001

MRI = magnetic resonance imaging.

* χ^2 Test.

[†] Some patients had >1 comorbid condition; therefore, comorbid conditions were not mutually exclusive.

[‡] Osteoporosis rate was 1.0% in patients with LBP using narcotics and was 0.6% in patients with LBP not using narcotic drugs.

[§] Included genetic disease, seizure, dementia, otitis media, sickle cell disease, urinary tract infection, irritable bowel syndrome, and HIV.

^{||} Identified only during the study period.

Table II

Prescriptions for narcotic drugs used, by comorbid chronic condition, among patients with lower back pain.

Comorbid Chronic Condition	Prescriptions for Narcotic Drugs, Mean	% of Narcotic Users, * (n = 6171)
Congestive heart failure	7.2	1
Chronic obstructive pulmonary disease	6.9	3
Anxiety	6.1	6
Ulcer	6.1	1
Arthritis	5.8	14
Depression	5.4	10
Osteoporosis	4.8	1
Arrhythmia	4.7	3
Asthma	4.4	7
Coronary artery disease	4.1	5
Cancer	4.1	2
Hypertension	3.8	23
Diabetes	3.6	10

* Some patients had >1 comorbid condition; therefore, comorbid conditions were not mutually exclusive. Nondisease conditions such as injury and pregnancy were excluded.

Table III

Result of multivariate logistic regression analysis associated with narcotic drug use among patients with lower back pain.

Parameter	Odds Ratio (95% CI)
Sex	
Male	1.0
Female	1.0 (0.9–1.1)
Age group	
18–<41 y	1.0
41–<56 y	1.0 (0.9–1.1)
56–<65 y	0.8 (0.7–0.9)*
Comorbid chronic condition	
Cancer	3.0 (2.1–4.3) [†]
Arthritis	3.0 (2.6–3.4) [†]
Chronic obstructive pulmonary disease	2.3 (1.7–3.1) [†]
Ulcer	2.0 (1.2–3.0) [†]
Anxiety	1.6 (1.3–1.9) [†]
Diabetes	1.5 (1.3–1.7) [†]
Congestive heart failure	1.4 (0.9–2.4)
Hypertension	1.4 (1.3–1.6) [†]
Depression	1.4 (1.2–1.6) [†]
Asthma	1.4 (1.2–1.6) [†]
Coronary artery disease	1.3 (1.1–1.7) [†]
Arrhythmia	1.1 (0.8–1.4)
Osteoporosis	1.0 (0.7–1.6)
Other [‡]	1.3 (1.2–1.6)
Pregnancy	1.8 (1.3–2.4) [†]
Injury	1.8 (1.7–2.0) [†]
Health care resource utilization	
Surgery	18.7 (8.1–43.0) [†]
Epidural	4.3 (2.7–7.5) [†]
MRI	4.0 (2.6–6.0) [†]
Emergency department	2.6 (2.1–3.0) [†]
Physical therapy	1.2 (1.0–1.5)*
Chiropractic services	0.4 (0.3–0.5) [†]

MRI = magnetic resonance imaging.

* $P < 0.05$.

[†] $P < 0.001$.

[‡] Included genetic disease, seizure, dementia, otitis media, sickle cell disease, urinary tract infection, irritable bowel syndrome, and HIV.

Table IV

Results of multivariate logistic regression analysis of correlates for emergency department (ED) use among patients with lower back pain.

Parameter	Odd Ratio (95% CI)
Narcotic drug use	1.6 (1.3–2.0) *
Sex	
Male	1.0
Female	1.0 (0.9–1.2)
Age group	
18–<41 y	1.0
41–<56 y	0.6 (0.5–0.7) *
56–<65 y	0.5 (0.4–0.6) *
Chronic comorbid condition	
Ulcer	1.5 (0.9–2.6)
Coronary artery disease	1.3 (1.0–1.9)
Anxiety	1.3 (1.0–1.8)
Asthma	1.3 (1.0–1.7)
Arrhythmia	1.2 (0.8–1.8)
Chronic obstructive pulmonary disease	1.1 (0.7–1.7)
Depression	1.0 (0.8–1.3)
Hypertension	1.0 (0.8–1.2)
Diabetes	1.0 (0.8–1.3)
Arthritis	0.8 (0.6–1.0)
Congestive heart failure	0.6 (0.3–1.3)
Osteoporosis	0.5 (0.2–1.2)
Cancer	0.4 (0.2–1.0)
Other [†]	1.8 (1.5–2.3) *
Pregnancy	1.0 (0.6–1.6)
Injury	2.6 (2.2–3.0) *
Prior hospitalization or ED use	2.4 (2.0–2.8) *

* $P < 0.001$.

[†] Included genetic disease, seizure, dementia, otitis media, sickle cell disease, urinary tract infection, irritable bowel syndrome, and HIV.

Table V

Health care resource utilization costs among patients with lower back pain using or not using narcotics. Values are US \$ (% of total costs).

Health Care Resource Utilization *	Narcotic Users (n = 6171)	Narcotic Nonusers (n = 7589)	All Patients (N = 13,760)
Emergency department [†]	1,550,598 (5)	530,750 (3)	2,081,348 (4)
Surgery [‡]	2,115,413 (7)	133,151 (1)	2,248,564 (4)
Epidural [‡]	717,499 (2)	194,808 (1)	912,307 (2)
MRI [‡]	1,163,576 (4)	558,531 (3)	1,722,107 (3)
Physical therapy [‡]	1,340,160 (4)	1,157,210 (6)	2,497,370 (5)
Chiropractic services [‡]	208,226 (1)	444,559 (2)	652,785 (1)
Subtotal cost	7,095,472 (22)	3,019,008 (15)	10,114,481 (19)
Pharmacy cost ^{‡§}	25,419,681 (78)	16,883,769 (85)	42,303,450 (81)
Total cost [‡]	32,515,153 (100)	19,902,778 (100)	52,417,931 (100)

MRI = magnetic resonance imaging.

* Estimated from medical claims.

[†] $P < 0.05$ (t test).

[‡] $P < 0.001$ (t test).

[§] Sum of total paid amounts in pharmacy claims and includes the costs of narcotics and non-narcotic drugs.