

# Trends in Ambulatory Physician Opioid Prescription in the United States, 1997-2009

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**Objective:** To describe the changing practice pattern of opioid medication prescription by health care providers and its relationship to shifts in the incidence of back pain, demographics, and health care access.

**Design:** Retrospective analysis of nationally representative databases.

**Setting:** In silico.

**Participants:** Patients who presented at a set of randomly selected health care facilities on the days of data collection.

**Methods:** Nationally representative surveys from the Centers for Disease Control and Prevention (National Hospital and Ambulatory Medical Center Survey and National Ambulatory Medical Center Survey) were investigated for 3 ambulatory settings—emergency department (ED), primary care physician (PCP), and specialist physician offices—between the years 1997 and 2009. Diagnoses, prescription medications, insurance source, and demographics were determined. Weighted logistic regression modeling with the SAS program (SAS Institute, Cary, NC) was used to estimate 5-year odds ratios (ORs) and covariate effects.

**Main Outcome Measurements:** Diagnoses, prescription medications, insurance source, and demographics were measured. The relationships between opioid medication prescription and (1) the chief complaint and (2) back pain diagnoses were studied. Domain analysis was used to properly account for the stochasticity introduced by subset analyses.

**Results:** From 1997 to 2009, increasing all-diagnosis opioid prescription was accompanied by significant shifts in patient demographics and insurance access. For all-diagnosis opioid prescription, after we adjusted for age, gender, race, and insurance source, the increase persisted at a 5-year OR of 1.33, 1.29, and 1.53 for ED, PCP clinics, and specialist clinics (95% confidence interval 1.26-1.41, 1.19-1.40, and 1.37-1.69), respectively. The increasing prevalence of back pain diagnosis was eclipsed by increasing opioid prescriptions, estimated at 5-year ORs of 1.35, 1.38, and 1.75 for ED, PCP clinics, and specialist clinics (95% confidence interval 1.22-1.48, 1.19-1.61, 1.40-2.19), respectively.

**Conclusions:** In the United States, from 1997-2009, (1) variable increases in opioid prescription across ambulatory care settings were not accounted for by changing demographics and health care access; (2) significant disparities existed in opioid prescription as a function of age, gender, race/ethnicity, and payer source; and (3) for back pain, increasing opioid prescription was not accounted for by changing incidence.

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## INTRODUCTION

The increase in the use of prescription opioid medications has come under scrutiny in recent years. Studies have demonstrated a 3-fold increase between 1996 and 2002 overall [1] and an increasing use of more potent formulations [2,3]. In the United States, opioids have become the leading cause of prescription drug-related deaths [4]. According to the *Relieving Pain in America* report from the Institute of Medicine, not only does pain cost the United States up to \$635 billion each year in direct and indirect costs, its prevalence is also increasing [5]. Psychiatrists in particular are responsible for the long-term care of patients with chronic pain. As such, changing clinical practice patterns and regulatory oversight of controlled substances are of unique importance to this field.

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In July 2012, the Food and Drug Administration (FDA) approved a risk evaluation and mitigation strategy (REMS) to address the increasing misuse and abuse of prescription opioids, with a primary focus on physician education [6]. Physicians' comfort levels with the prescribing of opioids vary [7-9]. The word "opiophobia" has been coined to describe the fear of some physicians of the addictive properties and long-term consequences of opioids [10], and it is suggested that this fear stems from a lack of education [11].

The increasing use of prescription opioids for pain in the United States has been documented with the use of payer administrative, drug sale, and medication distribution data [1-3,12]. What has not been directly addressed is the impact of changing rates of back pain, shifting demographics, and the willingness of American health care providers to write opioid prescriptions. The latter issue is of particular interest, given the focus of the new FDA REMS decision.

In this study, we used data from 2 nationally representative databases, the National Hospital and Ambulatory Medical Center Survey (NHAMCS) and the National Ambulatory Medical Center Survey (NAMCS), to analyze the impact of these variables on opioid prescription in the ambulatory setting. We further focused our analysis on the use of opioids for the treatment of low back pain, which is the most common diagnosis for which opioid medications are prescribed [13].

Our hypothesis was that changes in opioid prescription vary across the clinical context of emergency departments (EDs), primary care physician (PCP) clinics, and specialist clinics, and that overall increases in opioid prescription were not accounted for by shifts in the incidence of low back pain, demographics, and health care insurance during this 13-year period. This report complies with the "Strengthening the Reporting of Observational Studies in Epidemiology" statement [14].

## METHODS

### Data

Data from the NAMCS and NHAMCS national surveys were obtained from the National Center for Health Statistics. These 2 surveys are designed to provide nationally representative information about ambulatory medical care services in the United States. Data are obtained for a sample of visits to non-federal-employed, office-based physicians (NAMCS) and hospital EDs and outpatient departments, as well as ambulatory surgery centers (NHAMCS). Specially trained interviewers from the CDC visit the physicians and conduct training prior to survey administration. Each physician is randomly assigned to a 1-week reporting period, during which a random sample of visits are recorded by the physician or office staff. Data obtained include the patients' symptoms, physicians' diagnoses, and medications ordered or provided; demographics; and

ambulatory services provided, including diagnostic procedures, patient management, and planned future treatment.

Survey data obtained from EDs from 1997-2009 were investigated. For clinics, sample survey data were combined from 1997-2009. Only visits for patients between ages 16 and 90 years were considered. Complete data were considered because missing data fields were rare.

### Chief Complaint and Reason for Visit

The chief complaint of back pain is indicated by the "reason for visit" code of the 4-digit codes 1905 ("back symptoms") and 1910 ("low back symptoms"). Per instructions from the Centers for Disease Control and Prevention, these codes exclude injuries. The following codes indicating a diagnosis of back pain from the *International Classification of Diseases*, 9th revision, were used: 353.1, lumbosacral plexus lesions; 722.1, displacement of thoracic or lumbar intervertebral disk without myelopathy; 722.52, degeneration of lumbar or lumbosacral intervertebral disk; 722.83, postlaminectomy syndrome, lumbar region; 724.02, spinal stenosis, lumbar region, without neurogenic claudication; 724.2, lumbago; 724.4, thoracic or lumbosacral neuritis or radiculitis, unspecified; 724.5, backache, unspecified; 738.4, acquired spondylolisthesis; 739.3, nonallographic lesions, lumbar region; 756.1, congenital anomalies of spine; 756.12, spondylolisthesis; 839.2, closed dislocation thoracic and lumbar vertebra; 846, sprains and strains of sacroiliac region; 847.2, sprain of lumbar; and 847.9, and sprain of unspecified site of back.

### Demographic Variables

Patient race and ethnicity were summarized with the use of provided variables, in the form of reported/imputed race or ethnicity depending on availability. Age was categorized into 4 groups (16-29, 30-44, 45-59, and 60-90 years) to create comparably sized groups for maximal descriptive power. Gender was obtained directly from the databases. Primary payer type is summarized for each year.

Variables indicating "primary care specialty" (NAMCS 2005-2009), "general and family practice" (NAMCS 2002-2004), or "general medicine" (NHAMCS 2002-2009) were used to analyze the subset of ambulatory visits attributable to PCPs. By default, the remainder was categorized as specialist physicians.

### Insurance Payer Source

The primary insurance payer source was extracted. A slight coding change was implemented in the year 2005, which may affect the subpopulation with 2 or more types of insurance. As such, we simplified payer source and created 2 binary variables, one to indicate Medicaid or self-pay as

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