

Trends in Opioid Dosing Among Washington State Medicaid Patients Before and After Opioid Dosing Guideline Implementation

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Abstract: By 2007, opioid-related mortality in Washington state (WA) was 50% higher than the national average, with Medicaid patients showing nearly 6 times the mortality of commercially-insured patients. In 2007, the *WA Interagency Guideline on Opioid Dosing for Chronic Non-cancer Pain* was released, which recommended caution in prescribing >120 mg morphine-equivalent dose per day for patients not showing clinically meaningful improvement in pain and function. We report on opioid dosing in the WA Medicaid fee-for-service population for 273,200 adults with a paid claim for an opioid prescription between April 1, 2006 and December 31, 2010. Linear regression was used to test for trends in dosing over that time period, with quarter-year as the independent variable and median daily dose as the dependent variable. Prescription opioid use among WA Medicaid adults peaked in 2009, as evidenced by the unique number of opioid users (105,232), the total number of prescriptions (556,712), and the total person-years of prescription opioid use (29,442). Median opioid dose was unchanged from 2006 to 2010 at 37.5 mg morphine-equivalent dose, but doses at the 75th, 90th, 95th, and 99th percentiles declined significantly ($P < .001$). These results suggest that opioid treatment guidelines with dosing guidance may be able to reduce high-dose opioid use without affecting the median dose used. **Perspective:** Some fear that opioid dosing guidelines might restrict access to opioid therapy for patients who could benefit. However, there is evidence that high-dose opioid therapy entails significant risks without demonstrated benefit. These findings indicate that high-dose opioid therapy can be reduced without altering median opioid dose in a Medicaid population.

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Key words: Chronic pain, morphine-equivalent dose, opioid safety, policy.

Prescribing of opioid analgesics quadrupled from 2000 to 2010^{6,7,19} following mandates for assessment of pain by accreditation agencies,

advocacy for opioid therapy by pain management leaders, and subsequent changes in state laws and regulations.³ Concurrently, accidental poisonings have become the leading cause of unintentional injury death in the United States, largely because of the increase in the number of deaths associated with prescription opioids.²⁵ In 2008, the opioid-related mortality rate in the United States was 4.8 per 100,000, but the rate in Washington state (WA) was more than 50% higher (7.4 per 100,000).²⁷ The number of opioid-related deaths among WA residents increased from under <50 in 1995 to >500 in 2008. By 2006, the death rate from accidental poisoning with prescription drugs in WA exceeded the death rate from motor vehicle accidents.³¹

In WA, the number of opioid overdose deaths were nearly 6 times higher among Medicaid patients than among privately insured individuals.⁸ Internal

Received April 27, 2015; Revised November 19, 2015; Accepted December 22, 2015.

This study was supported by Grant 5R21CE001850-01 from the Centers for Disease Control and Prevention to Gary M. Franklin. The study sponsor had no influence on the study design, the collection, analysis and interpretation of data, the writing of the report, or the decision to submit the article for publication.

Mark D. Sullivan has received Continuing Medical Education grant support from Opioid REMS Program Companies, and served as a consultant to Janssen and Relivant. The remaining authors have no conflicts of interest to declare.

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1526-5900/\$36.00

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<http://dx.doi.org/10.1016/j.jpain.2015.12.018>

Washington Medicaid analyses revealed that in 2002, >2,000 Medicaid patients received at least 366 days' supply of opioids from at least 3 different prescribers. Multiple studies have reported that opioid-related morbidity and mortality rates were highest among high-dose users.^{4,12,22,33}

In response to these escalating overdose deaths, the WA Agency Medical Directors' Group (AMDG), representing all publicly funded health insurance plans in WA, collaborated with clinical and academic pain experts to develop and implement the *Interagency Guideline on Opioid Dosing for Chronic Non-cancer Pain*.¹⁶ This guideline was intended to help primary care providers prescribe opioids to chronic noncancer pain patients more safely. Among recommended practices, a key feature was the recommendation that providers not exceed a dosing threshold of 120 mg morphine-equivalent dose (MED) per day for patients who did not have clinically meaningful improvement in pain and function without first obtaining a pain specialist consultation.

The AMDG guideline was the first in the nation to provide specific prescription opioid dosing guidance. The guideline also included recommendations concerning patient selection and risk assessment, initiating and discontinuing opioid therapy, and transitioning to chronic opioid therapy. Beginning March 1, 2007, the guideline was disseminated through presentations to provider groups, free Web-based training for continuing medical education credits, and posting on the National Guideline Clearinghouse and WA Medical Association Web sites.³²

We have previously reported on mortality, morbidity, and dosing in the WA Workers' Compensation population.^{15,17,21} We have also reported on trends in overdose hospitalization in the WA Medicaid population before and after implementation of the guideline.¹⁸ Here we report on opioid dosing patterns in the WA Medicaid population before and after guideline implementation. We hypothesized that we would see a reduction in high-dose opioid use (>120 mg MED) in the years after guideline dissemination. We examined the rates of opioid prescriptions per year, median doses of individual opioids, trends in daily median doses, and rates of any high-dose opioid use including all prescription opioids and all claimants.

Methods

Study Setting and Population

This study used enrollment and outpatient pharmacy claims data from WA Medicaid. The study was approved by the University of Washington and WA institutional review boards. The requirement for individual informed consent was waived because the investigators worked with deidentified data.

Study Cohort

We obtained WA Medicaid data from the WA Health Care Authority. WA Medicaid insures a total of

>1.4 million enrollees per year with approximately half between the ages of 18 and 64 years. Adults between the ages of 18 and 64 years were included in the study cohort if they had a paid claim for an opioid prescription in the Medicaid fee-for-service system between April 1, 2006 and December 31, 2010. Individuals were included if they had at least 1 paid claim for an opioid prescription between April 1, 2006 and December 31, 2010. We excluded from analysis any months in which individuals had dual Medicare-Medicaid eligibility, periods of Medicaid managed care, and periods of Medicaid noneligibility because pharmacy records were unavailable for those periods. Minimum enrollment was 1 month. During the study period, the mean duration of Medicaid enrollment for enrollees receiving at least 1 opioid prescription was 21.4 months (SD = 17.4) and median was 16 months (minimum = 1 month, maximum = 57 months). Total Medicaid enrollment for opioid-exposed enrollees was >485,000 total person-years. The final cohort consisted of 273,022 adults.

Opioid Measures

For all patients in the cohort, we reviewed pharmacy, hospital, medical, enrollment, and demographic data for all study years. The pharmacy data included the National Drug Code, drug strength, days' supply of the drug, the quantity of drug supplied, the drug name, the Drug Enforcement Administration (DEA) class code, the therapeutic class, the date prescribed, the date dispensed, and payment information. For each opioid prescription filled, we defined the start date as the date dispensed and the end date as the date dispensed plus the number of the days' supply minus 1. The days covered by opioids were counted from the start date to the end date. To calculate the daily MED of each opioid, we multiplied number of pills (or patches) dispensed by the drug strength, divided by the days' supply, and then multiplied by a morphine conversion factor.^{29,30,32} When patients had more than 1 opioid medication available on the same day, the total daily dose was calculated by adding the daily doses for each medication. For nonoverlapping prescriptions, the total days' supply is the sum of the days' supply across all prescriptions. When the dates of prescriptions overlapped, each calendar day was only counted once. Overlapping prescriptions were counted as concurrent use of the prescriptions because Medicaid tightly regulated early refills. The daily dose per quarter was calculated as the sum of the daily doses for each day in the quarter divided by the number of days in the quarter covered by opioid prescriptions. We created 3 types of opioid medications on the basis of the DEA schedule and whether the medication was short- or long-acting (short-acting schedule II, long-acting schedule II, or nonschedule II opioids—which includes schedule III, schedule IV, and unscheduled opioids [tramadol]). To examine differences in prescribing patterns for different types of opioids, we determined the daily dose for each type of opioid separately, as well as the total aggregated across all individual opioids. We examined the proportion of claimants who

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