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## Opioid Prescribing After Surgical Extraction of Teeth in Medicaid Patients, 2000–2010

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Opioid abuse has reached epidemic proportions in the United States<sup>1,2</sup> and often begins with a prescription for a pain medication. Dentists are among the leading prescribers of opioid analgesics,<sup>3</sup> and surgical tooth extraction is one of the most frequently performed dental procedures. Surveys suggest that dental practitioners commonly prescribe opioids following this procedure,<sup>4</sup> despite evidence that a combination of nonsteroidal medications and acetaminophen may provide more effective analgesia for postextraction pain.<sup>5</sup> Little information is available on nationwide patterns of opioid prescribing following tooth extraction.

### Methods

The use of the Medicaid database for research was approved by Partners' institutional review board and the need for informed consent was waived. We collected data from the Medicaid Analytic eXtract—a national database of deidentified health claims drawn from Medicaid transactions for the years 2000–2010, which were combined for this analysis.<sup>6</sup> All patients who underwent surgical dental extraction were included, identified by *Current Dental Terminology* codes. The cohort was restricted to patients with continuous Medicaid coverage from 90 days before through 7 days following extraction, allowing for up to a 7-day lapse in coverage. We determined the frequency of opioid prescriptions filled within 7 days of extraction and the nature and amount of opioids dispensed. Patients were stratified by age, sex, and type of extraction. Patients who filled an opioid prescription in the 90 days prior to extraction were excluded.

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**Author Contributions:** Dr Bateman and Ms Levin had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

*Study concept and design:* Baker, Avorn, Bateman.

*Acquisition, analysis, or interpretation of data:* Baker, Avorn, Levin, Bateman.

*Drafting of the manuscript:* Baker, Bateman.

*Critical revision of the manuscript for important intellectual content:* All authors.

*Statistical analysis:* Levin.

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The opioids studied included codeine, hydrocodone, hydromorphone, levorphanol, meperidine, methadone, morphine, oxycodone, oxymorphone, pentazocine, propoxyphene, tramadol, and fentanyl. To examine the amount of opioids dispensed, the dose prescribed was converted into morphine equivalents. Patients younger than 18 years were excluded from the analysis of quantity dispensed, as pediatric dosing is often weight-based. Patients receiving nontablet or noncapsule formulations (eg, liquids) were also excluded. All analyses were performed in SAS (SAS Institute), version 9.4.

## Results

There were 2 757 273 patients in the cohort. The mean age was 24.9 years (SD, 13.3) and 64% were women. Within 7 days of extraction, 1 161 747 patients (42%) filled a prescription for an opioid medication. The most commonly dispensed opioid was hydrocodone (78% of all prescriptions), followed by oxycodone (15.4%), propoxyphene (3.5%), and codeine (1.6%). Patients aged 14 to 17 years had the highest proportion of filled opioid prescriptions (61%), followed by patients aged 18 to 24 years (52%) (Table 1).

The median number of milligrams of morphine equivalents dispensed to adults following extraction was 120 (interquartile range [IQR], 90–150; 10th–90th percentile range, 75–225) (Table 2), representing 24 5-mg tablets of hydrocodone (IQR, 18–30) or 16 5-mg tablets of oxycodone (IQR, 12–20). The median number of morphine equivalents dispensed was highest for patients who underwent more invasive procedures (extraction of impacted teeth rather than nonimpacted teeth).

## Discussion

In this large cohort of Medicaid patients from throughout the United States, prescriptions for opioids were filled by 42% of patients within 7 days following surgical tooth extraction. There was great variability in the amount of opioids dispensed for a given procedure, with an approximately 3-fold difference between the 10th and 90th percentile in the oral morphine equivalents prescribed. Although a limited supply of opioids may be required for some patients following tooth extraction, these data suggest that disproportionately large amounts of opioids are frequently prescribed given the expected intensity and duration of postextraction pain, particularly as nonopioid analgesics may be more effective in this setting.<sup>5</sup>

This study has limitations. Findings based on data from Medicaid claims may not generalize to a commercially insured population. Also, the final year of the study was 2010, and it is possible that dental prescribing practices have changed somewhat since that time.

This common dental procedure may represent an important area of excessive opioid prescribing in the United States. As the nation implements programs to reduce excessive prescribing of opioid medications, it will be important to include dental care in these approaches.

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**Table 1**Proportion of Medicaid Patients Dispensed Opioids Following Surgical Extraction of Teeth, 2000–2010<sup>a</sup>

	No. of Patients	Dispensed Opioid, No. (%)
Overall cohort	2 757 273	1 161 747 (42)
Age group, y		
13	367 219	52 528 (14)
14–17	657 535	400 549 (61)
18–24	646 370	339 386 (52)
25–34	492 104	196 051 (40)
35–44	302 048	97 703 (32)
45–54	184 500	51 557 (28)
55	107 497	23 973 (22)
Sex		
Men	979 352	405 120 (41)
Women	1 777 921	756 627 (43)
Procedure type		
Surgical extraction of nonimpacted tooth	1 718 053	544 971 (32)
Removal of impacted tooth		
Soft tissue	245 505	140 514 (57)
Partially bony	475 053	301 706 (64)
Completely bony	669 199	466 616 (70)
Completely bony with unusual surgical complications	60 478	41 280 (68)
Surgical removal of residual tooth roots	169 613	53 853 (32)

<sup>a</sup>Data were from the Medicaid Analytic eXtract.

**Table 2**

Amount of Oral Morphine Equivalents Dispensed Following Tooth Extraction by Procedure Type Among Medicaid Patients (N = 693 702)<sup>a,b</sup>

	<b>Dispensed Morphine Equivalents, mg</b>
	<b>Median (IQR) [10th–90th Percentile]</b>
Overall cohort	120 (90–150) [75–225]
By procedure	
Surgical extraction of nonimpacted tooth	113 (90–150) [68–225]
Removal of impacted tooth	
Soft tissue	120 (100–150) [75–225]
Partially bony	140 (100–160) [75–225]
Completely bony	150 (100–188) [80–225]
Completely bony with unusual surgical complications	150 (113–210) [90–250]
Surgical removal of residual tooth roots	125 (98–180) [75–276]

<sup>a</sup>Data were from the Medicaid Analytic eXtract.<sup>1</sup>

<sup>b</sup>Oral morphine equivalents calculated based on the following study: Von Korff M, Saunders K, Thomas Ray G, et al. De facto long-term opioid therapy for noncancer pain. *Clin J Pain*. 2008;24(6):521–527.

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