



Research Paper

# Opioid prescribing patterns within otolaryngology

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## KEYWORDS

Opioids;  
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**Abstract** *Objective:* Determine current opioid prescribing patterns for adult procedures within an academic Otolaryngology-Head and Neck Surgery training program in order to establish a general guideline and more uniform approach to narcotic prescribing practices.

*Methods:* This is a prospective, single-center pilot study. An online, anonymous survey was sent to all members of the Otolaryngology-Head and Neck Surgery training program at Medical University of South Carolina including residents, fellows, and attending surgeons, and advanced practice providers (APP). The survey consisted of questions including demographics, most commonly prescribed analgesic and the average number of opioid tablets prescribed post-operatively for eleven of the most common adult procedures within Otolaryngology.

*Results:* Forty-two participants responded to the survey. Of the 42 respondents, 20 were attending surgeons, 11 junior level residents (year 1–3), 6 senior level residents (year 4–5), and 5 A.P.P.s. The most commonly prescribed narcotic was hydrocodone-acetaminophen with 83.3% (35/42) of respondents prescribing this medication. Tonsillectomy or uvulopalatopharyngoplasty had the highest average number of tablets prescribed at 32.3 (Range: 5 to 90). Neck dissection, parotidectomy, and thyroidectomy procedures all averaged over 20 tablets. Direct laryngoscopy opioid dose was the lowest at 4.8 tablets (range 0–20). Opioid prescriptions by surgery were broken down by provider class with only septoplasty showing a significant difference with attending physicians prescribing an average of 20 tablets vs 14.1 tablets for residents ( $P = 0.034$ ).

*Conclusion:* We believe there remains an unacceptably high variability in current opioid prescribing patterns within otolaryngology especially within more painful procedures.

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Establishment of standardized post-operative narcotic guidelines is warranted.

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## Introduction

The opioid problem in the United States has been building for several decades with the number of opioid prescriptions quadrupling from 1991 to 2012 to almost 260 million per year.<sup>1</sup> The increase in availability of prescription opioids has led to an increase in opioid misuse and abuse with approximately 2 million people in the U.S suffering from substance abuse related to prescription opioids.<sup>2,3</sup> Opioid related deaths have also increased over this period and are now responsible for more deaths than motor vehicle accidents.<sup>4</sup> These recent trends as well as an expanding public awareness of the brewing epidemic, led to the declaration of the opioid crisis as a public health emergency in 2017.<sup>5</sup> This epidemic has led to multiple medical specialties attempting to determine their role in the opioid crisis.

The first recommendation of the Centers for Disease Control and Prevention to prevent opioid-related deaths is to educate providers to improve opioid prescribing patterns. Opioid prescribing rates among surgeons are second only to pain management specialists.<sup>6</sup> Key contributors to this large pool of available opioids are post-operative prescriptions. Recent emphasis on patient satisfaction has led to increased focus on improving pain control, which may lead surgeons to err on the side of overprescribing.<sup>7</sup> Studies have shown that up to 80% of narcotic prescriptions end up incompletely used, a statistic that questions the gap between adequate pain control and prescribing practices.<sup>8</sup>

For surgical specialties, post-operative prescribing practices generally lack an evidence-based approach with residents most often modeling their prescribing habits after those of their senior residents and/or attendings.<sup>9</sup> Within otolaryngology in particular, there are currently no procedure specific post-operative narcotic guidelines, leaving room for inconsistency in prescribing practices.<sup>10</sup> Schwartz et al<sup>11</sup> recently surveyed practicing otolaryngologists to evaluate national trends in opioid prescribing for the most common surgical procedures. They identified nationwide variability in prescribing patterns that depended largely on the preference of the surgeon, further emphasizing the discrepancy in current post-operative opioid regimens. Given that opioid prescribing habits are often learned in residency training, the present study looks to examine current opioid prescribing trends that exists in an otolaryngology residency training program. This will be the first study to look at opioid prescribing patterns within a training program in our specialty with the hope to use this data to help establish more uniform prescribing habits.

## Methods

This study is a single institution pilot study looking at the opioid prescribing habits within the Department of Otolaryngology- Head and Neck Surgery at the Medical University of South Carolina (MUSC). Study design was deemed a quality improvement project and exempt from review by the Institutional Review Board.

An online REDCap (Research Electronic Data Capture, Vanderbilt University, National Institutes of Health, NIH/NCATS UL1 TR000445) survey was sent to all members of the Otolaryngology Department including residents, fellows, and attending surgeons, and advanced practice providers (e.g. nurse practitioners or physician assistants; A.P.P.).<sup>12</sup> Study data were collected and managed using REDCap electronic data capture tools hosted at the MUSC. REDCap is a secure, web-based application designed to support data capture for research studies, providing (1) an intuitive interface for validated data entry; (2) audit trails for tracking data manipulation and export procedures; (3) automated export procedures for seamless data downloads to common statistical packages; and (4) procedures for importing data from external sources.<sup>12</sup>

The survey consisted of 14 questions including demographics, most common prescribed analgesic and the average number of opioid doses prescribed post-operatively for eleven of the most common adult procedures within otolaryngology. The procedures were: Tonsillectomy/Uvulopalatopharyngoplasty (UPPP)/Tongue Base Surgery (TBS), Septoplasty, Endoscopic Sinus Surgery, Parotidectomy, Tympanoplasty, Mastoidectomy, Thyroid/Parathyroid, Neck Dissection, Soft Tissue Dissection/Sentinel Node Biopsy, Rhinoplasty, and Direct Laryngoscopy with or without intervention (such as injection augmentation). Respondents were asked to list typical opioid dose in number of tablets normally prescribed to control post-operative pain only in a standard adult patient without comorbid conditions and following an uncomplicated procedure. For this paper, one opioid dose was defined as equivalent to a single hydrocodone/acetaminophen 5/325 mg tablet. Subjects only answered questions for surgeries for which they commonly prescribe narcotics. Surveys were anonymous. Since A.P.P.s cannot prescribe narcotics in the state of South Carolina, they were asked to provide average narcotic dosage of their associated attending surgeon/specialty.

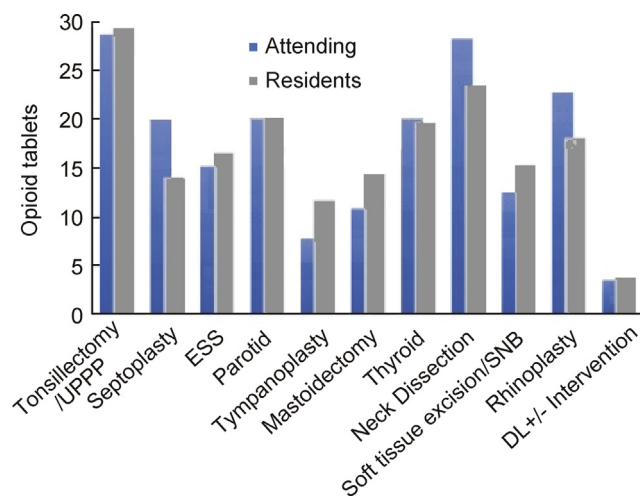
## Statistical analysis

All analyses and graphs were performed with Sigma Plot 12.5 (Systat Software, Inc., San Jose, California) and

MedCalc 18.5 (MedCalc Software bvba, Ostend, Belgium). Continuous variables were summarized by mean ± standard deviation (SD) and range. Nominal variables were summarized by frequency and percentage. All continuous variables were tested for normality, as determined by the Kolmogorov–Smirnov test. Comparisons of outcomes (nominal variables) were performed with Fisher’s exact or chi-square test. For continuous variables, comparisons were made with an independent *t* test or a Wilcoxon rank sum test. A *P* value < 0.05 was considered indicative of statistical significance.

### Results

Forty-two participants of fifty-four individuals responded to the survey for a 78% response rate. Of the 42 respondents, 20 were attending surgeons, 11 junior level residents (year 1–3), 6 senior level residents (year 4–5), and 5 A.P.P.s. Of the attending surgeons, 50% (10/20) completed medical training greater than 10 years ago, 35% (7/20) completed < 10 years ago, and 15% (3/20) were fellows. The most commonly prescribed narcotic was hydrocodone-acetaminophen with 83.3% of respondents prescribing this medication (Fig. 1). No participant selected tramadol or acetaminophen with codeine. Opioid prescriptions for each of the 11 adult otolaryngology procedures are listed in Table 1. Tonsillectomy/UPPP/TBS had the highest average number of opioids prescribed at 32.3 tablets (Range: 5 to 90). Neck dissection, parotidectomy, and thyroidectomy procedures all averaged over 20 tablets. Direct laryngoscopy was prescribed the lowest at 4.8 tablets (range 0–20). Opioid prescriptions per surgery were then analyzed by provider class. Overall results were similar with only septoplasty being showing significant difference with attending physicians prescribing an average of 20 tablets vs 14.1 tablets for residents (*P* = 0.034, Fig. 2). There were no significant differences found between junior and senior

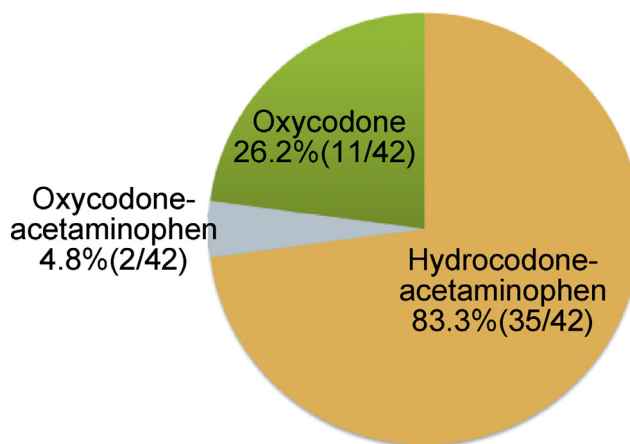


**Fig. 1** Most common analgesic prescribed The three most common analgesics prescribed by the participants were hydrocodone-acetaminophen, oxycodone, and oxycodone-acetaminophen. Tramadol and acetaminophen with codeine were not selected by any of the participants.

**Table 1** Mean opioid tablets per surgery.

| Surgery                  | N  | Mean | SD   |
|--------------------------|----|------|------|
| Tonsillectomy//UPPP      | 33 | 31.3 | 19.3 |
| Septoplasty              | 29 | 15.6 | 7.2  |
| ESS                      | 30 | 15.5 | 7.6  |
| Parotid                  | 27 | 22.7 | 16.0 |
| Tympanoplasty            | 29 | 9.7  | 6.4  |
| Mastoidectomy            | 29 | 12.7 | 7.0  |
| Thyroid                  | 25 | 21.2 | 11.2 |
| Neck Dissection          | 25 | 27.0 | 18.8 |
| Soft tissue excision/SNB | 30 | 13.9 | 7.5  |
| Rhinoplasty              | 25 | 17.7 | 8.9  |
| DL ± Intervention        | 30 | 4.6  | 6.1  |

UPPP: Uvulopalatopharyngoplasty; ESS: Endoscopic Sinus Surgery; SNB: Sentinel Node Biopsy; DL: Direct Laryngoscopy.



**Fig. 2** Opioid prescription by provider The eleven surgeries are listed with the mean number of opioid tablets by provider, attending physician vs. resident are presented in this chart. Septoplasty was the only procedure that showed a statistically significant difference between attendings and resident prescribing patterns. UPPP: Uvulopalatopharyngoplasty; ESS: Endoscopic Sinus Surgery; SNB: Sentinel Node Biopsy; DL: Direct Laryngoscopy.

level residents or attendings with more or less than 10 years experience.

### Discussion

Over the past twenty years, opioid prescriptions have increased at an alarming rate. It is now estimated that a quarter billion opioid prescriptions are written in the United States each year.<sup>1</sup> This has created an excess supply of opioids fueling the rise in long-term addiction, diversion for illicit use, and/or narcotic overdoses.<sup>13,14</sup> A significant contributor to the excess opioid supply could be attributed to post-operative opioid prescriptions. Bartels et al<sup>8</sup> showed that up to half of narcotics prescribed for post-operative analgesia after large surgeries (e.g. cesarean section, thoracic surgery) go unused. The role of the surgeon can be difficult as we attempt to balance both post-

operative analgesic needs while being cognizant of the perils of over-prescribing.

There have only been a few small case series to determine post-operative pain and narcotic needs for specific otolaryngologic procedures. Patel et al<sup>15</sup> showed that patients prescribed between 20 and 30 hydrocodone-acetaminophen tablets after rhinoplasty only used an average of 8.7 with 75% of patients using less than 15. Two studies showed an average use of 5 or less narcotic tablets after endoscopic sinus surgery.<sup>16,17</sup> Lou et al<sup>18</sup> found that 93% of patients undergoing thyroidectomy or parathyroidectomy used less than 20 oral morphine equivalents. Finally, for direct laryngoscopy, it was shown that narcotics were needed in only 20% of cases.<sup>19</sup> The above studies show we often prescribe substantially more narcotics than are needed by patients. This indicates a key area for improvement, and in many of the studies listed their findings have led to changes in institutional prescription practices.<sup>15–19</sup> The specialty, however, still lacks clear guidelines for post-operative pain management.

The results of this study demonstrate a high variability in opioid prescribing patterns for adult procedures for both residents and attending surgeons from one otolaryngology training program. For example, the smallest standard deviation was 6.1 tablets for direct laryngoscopy (Table 1). Hydrocodone-acetaminophen was by far the most common analgesic prescribed followed by oxycodone which is consistent with previous literature.<sup>20</sup> Tonsillectomy/UPPP/TBS had the highest mean opioid tablets prescribed correlating with previous reports describing tonsillectomy as one of the top 25 most painful surgical procedures within all specialties.<sup>21</sup> There is a commonly described idea that, as one would expect, prescribing patterns are learned within training programs. When results were broken down by physician group, only septoplasty was found to show a significant difference in prescribing habits between attendings and residents. No significant differences were found between junior/senior residents and attendings with less than 10 years of experience versus those with over 10 years experience.

There are multiple limitations to this study. Given that this is a survey study, there are inherent biases including recall and selection bias. Additionally, the study is limited by small sample size. All participants for this study are from the same training program. There are currently no post-operative narcotic protocols within the department, but several specialties have long-standing unwritten protocols developed from clinical experience that likely affected outcomes. Advanced practice providers were also included in this survey but cannot prescribe narcotics which is another limitation. The reasoning for their inclusion was their close interaction with both physicians (attendings and residents) and patients. This provided them the unique ability to know typical prescription dosages as well as the pain requirements and experiences of many patients for the procedures discussed. Their surveys were answered based on attending preference and clinical experience.

This was a pilot study to determine opioid prescribing patterns within one otolaryngology training program. Future directions and plans will be to use this survey to poll all accredited otolaryngology training programs to determine resident prescribing protocols across the country.

Additionally, multi-modal analgesic protocols utilizing non-narcotic analgesics, such as gabapentin and COX-2 inhibitors, are gaining popularity within the surgical community, and further education is needed for surgeons before we see widespread implementation. Finally, we will use the information gained in this study to develop an opioid prescribing guideline for our department with plans to repeat this study to determine if the guidelines alter prescribing patterns.

## Conclusion

While there are many variables to consider in the treatment of post-operative pain (e.g. pain tolerance, comorbid conditions, chronic pain, cancer, surgical complications), there remains unacceptably high variability in current opioid prescribing patterns within Otolaryngology. This is notably apparent within increasingly painful procedures such as tonsillectomy. Establishment of standardized post-operative narcotic guidelines is warranted.

## Conflicts of interest

None.

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