

# Quality Improvement in Pain Medicine



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## KEYWORDS

- Opioid crisis • Overprescription • Multimodal analgesia • HCHAPs
- Joint commission

## KEY POINTS

- The opioid crisis was created in part by bringing to light the lack of recognition of pain and encouragement of heavily addressing pain.
- Efforts have been made to address policies that have contributed to the overprescription of opioids.
- Multimodal analgesic plans and creating prescriber guidelines has an impact on the amount of opioids prescribed and consumed among patients.

## INTRODUCTION

The United States is in the midst of an opioid epidemic and grappling with how to address pain and safely steward these potentially dangerous medications. Pain management is a challenging issue among doctors and patients. The challenges of addressing pain stem from a multitude of factors including the subjectivity associated with pain and the dependence paired with opioid use and abuse. It is difficult for practitioners to objectify pain, which in turn leaves some patients overtreated and others suffering.

## NATIONAL EFFORTS TO ASSESS PAIN

Over the last 30 years, there have been several cultural shifts in the approach to pain and use of opioids. In the early 1990s, a pivotal report released by the president of the American Pain Society brought to light the shortcomings of pain management and highlighted the issue of undertreatment of analgesic-responsive acute pain and chronic cancer pain.<sup>1</sup> The issue was thought to be embedded in the failure of patients in reporting their pain to health care providers, the inability of nurses to be able to adjust the dose of pain medication, and the reluctance of physicians to use opioids.<sup>2</sup>

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Also emphasized in this report was the therapeutic use of opiate analgesics and the “rare result of addiction.” This coincided with relaxation in regulations for opioid prescribing, and marketing by pharmaceutical companies. As a result, opioid prescribing in the United States soared.<sup>1</sup> Currently, the country contains approximately 5% of the world’s population and consumes more than 99% of the world’s hydrocodone with similar rates among other opioid preparations.<sup>3</sup>

National policies have reflected these cultural attitudes. Policies designed by the Centers for Medicare and Medicaid Services (CMS), the Joint Commission on Accreditation of Healthcare Organizations (Joint Commission), and others that improve the quality of treatment of pain may have also inadvertently contributed to the rising use of opioids. It is important for otolaryngologists to understand how these policies have changed over time to understand how incentives to address pain have evolved.

First in 2000, Dr O’Leary, president of the Joint Commission, announced new standards of care for pain, mandating that health care organizations assess pain at each encounter with the patient, incorporating pain as the “fifth vital sign” into widespread use.<sup>4</sup> Responsibility was placed on health care organizations to incorporate a systematic assessment of pain and to use quantitative measures of pain, such as 10-point scale.<sup>4</sup> Institutions that wished to be in compliance with the Joint Commission became responsible for the assessment and management of pain in all patients. Skeptics of these new standards argued that requiring patients to be screened for the presence of pain and making it a “patient’s right” issue fostered overreliance on opioids.<sup>5</sup>

Next, in 2006 the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey was introduced as a method for measuring patients’ experiences at US hospitals that accentuated the importance of pain control for patients. This publicly reported survey consists of 29 questions completed by patients within 48 hours to 6 weeks after discharge regarding their hospital stay. The topics questioned include multiple components of hospital care, including pain control (**Box 1**).<sup>6</sup> These questions initially focused on assessing how often pain was well controlled and whether or not the hospital staff did everything possible to control pain. Because of the correlation of the timing of filling potential opioid prescriptions on discharge and completion of the HCAHPS survey, it has been hypothesized that this survey could inadvertently incentivize clinicians to overprescribe opioids on discharge to ensure sufficient ratings and reimbursement.

The significance of the HCAHPS measures was further elevated in 2010 when the Patient Protection and Affordable Care Act included HCAHPS among the measures to be used to calculate value-based incentive payments in the Hospital Value-Based Purchasing program. CMS uses this program to incentivize hospitals to improve the quality of care. As data on the opioid epidemic became more apparent there has been recognition that these policies need to be adapted.

**Box 1****HCAHPS questions related to pain**

During this hospital stay, did you need medicine for pain?

During this hospital stay, how often was your pain well controlled?

During this hospital stay, how often did the hospital staff do everything they could to help you with your pain?

## UNINTENDED COSTS OF SATISFACTION: THE OPIOID EPIDEMIC

These policies, which encourage aggressive treatment of pain, combined with opioid manufacturers heavily pushing opioids as a safe and effective treatment and a cultural shift in attitudes about pain contributed to the rise in opioid abuse and overdose. As a result of the combined effects opioid consumption tripled in the United States between 2000 and 2012.<sup>3</sup> Even as efforts to aggressively treat pain were ramping up, reports from institutions across the nation began to recognize adverse drug reactions associated with increased opioid usage. In 2005, a large prospective study found that the incidence of opioid-related oversedation and respiratory depression events more than doubled following implantation of a numerical pain treatment protocol.<sup>7</sup> Gradually, evidence of problems from overuse of opioids emerged and by 2012 it became clear that there was a rising epidemic of opioid abuse and overdose.<sup>8</sup> Sadly, since 2000 more than 300,000 Americans have died as a result of opioid overdose.<sup>9</sup>

## NATIONAL EFFORTS TO RESPOND TO THE OPIOID EPIDEMIC

Although neither the Joint Commission's Pain Management Standards nor the HCAHPS survey explicitly promote opioid use, the focus on aggressive pain management may have contributed to increases in prescribing. In response to the opioid epidemic, these organizations have made changes to address the embedded issues.

By 2004, the Joint Commission removed the phrase "pain as the fifth vital sign" from the Accreditation Standards Manual and by 2009 the requirement that pain be assessed in all patients was also removed. In 2011, a statement was added encouraging the use of pharmacologic and nonpharmacologic strategies for pain control, and examples of nonpharmacologic strategies to be tried.<sup>2</sup> On January 1, 2018 the Joint Commission revised the pain assessment and management standards to encourage safe opioid use and pain control. These new requirements call for educational resources for licensed independent practitioners; referrals to pain management specialists in cases of complex pain management needs; an online prescription drug monitoring program accessible to practitioners and pharmacists; the development of realistic expectations and goals that are understood by the patient for the degree, duration, and reduction of pain; and regular monitoring of opioid use and prescription by the organization.

Similarly, the HCAHPS survey questions discussing pain control in the hospital have undergone an evolution. Beginning in 2018, CMS announced that it would remove pain management questions from its determination of hospital payments. Pain management questions are now refined to focus on the health care organizations' communication with patients about pain during the hospital stay instead of focusing on how well pain was controlled. **Box 2** displays the new HCAHPS pain questions.

### Box 2

#### Revised HCAHPS questions

During this hospital stay, did you have pain?

During this hospital stay, how often did hospital staff talk with you about how much pain you had?

During this hospital stay, how often did hospital staff talk with you about how to treat your pain?

It is important for surgeons to understand that the quality metrics assessing pain have changed such that incentives to potentially overtreat pain have been removed. Furthermore, although providers may have felt pressured to aggressively treat pain to improve satisfaction scores, recent data indicate that this belief may be unfounded. A hospital level cohort study of 31,481 patients that underwent surgery at 47 different hospitals across Michigan looking at postoperative opioid prescribing and HCAHPS pain measures, found there to be no correlation between postoperative opioid prescribing and HCAHPS scores.<sup>10</sup>

### **USING A QUALITY IMPROVEMENT FRAMEWORK TO ADDRESS OPIOID PRESCRIBING**

Postoperative pain control is highly variable and ripe for quality improvement. One of the grandfathers of the modern quality improvement, Dr W. Edwards Deming, is quoted, "Uncontrolled variation is the enemy of quality."<sup>11</sup> Standardizing postoperative opioid prescribing and using multimodal nonopioid analgesia are two strategies that can address this variation and minimize excess opioids. Excess opioid prescribing places patients at risk of developing opioid dependency and communities at risk because of diversion.

Wide variation exists in prescribing for postoperative pain control.<sup>12</sup> A prospective study of patients undergoing thyroidectomy, parathyroidectomy, parotidectomy, sialendoscopy, and transoral robotic surgery identified that more than 50% of postoperative opioids went unused.<sup>13</sup> As expected there was wide variation in opioid consumption from a mean of 30 morphine milligram equivalent (MME; equivalent to four tablets of 5 mg oxycodone) for parathyroidectomy to 221 MME for transoral robotic surgery (equivalent to 30 tablets of 5 mg oxycodone). Numerous other studies have similarly found wide variation. Many otolaryngology departments have used a quality improvement framework to investigate this variation and improve pain management while minimizing opioid prescribing.

### **INCORPORATION OF MULTIMODAL ANALGESIA**

Postoperative pain control and opioid consumption depend on the complete perioperative pain control strategy used. Preoperative education, medications given before incision, and postoperative medications all impact patients' perceived pain after surgery and it is necessary to consider the entire perioperative pain control strategy used. Postoperatively, the number of opioid tablets prescribed may anchor patients' expectations for pain and influence opioid consumption. Overall, patients consume five additional pills for every 10 pills overprescribed.<sup>14</sup> Another source of variation in postoperative opioid consumption depends on concomitant analgesia modalities. Combinations of multiple scheduled nonopioid pain medications have been increasingly used by many surgeons to replace and/or decrease postoperative opioids. Given the risks of subsequent opioid addiction developing from short-term opioids for acute pain, multimodal nonopioid therapy should be favored for mild to moderately painful surgeries.

Although the risk of bleeding from nonsteroidal anti-inflammatory drugs (NSAIDs) is low,<sup>15</sup> many surgeons concerned about the potential risk of bleeding have been hesitant to use NSAIDs postoperatively. However, NSAIDs are a diverse family of medications with different potential risks of bleeding depending on the proportion of cyclooxygenase (COX)-1 inhibition. Celecoxib is a selective COX-2 inhibitor that has been associated with fewer negative systemic effects, such as gastric ulceration and bleeding.<sup>16</sup> Celecoxib has recently been incorporated in nonopioid pain

management regimens,<sup>17</sup> whereas other surgeons encourage use of nonselective NSAIDs, such as ibuprofen.<sup>18</sup>

## SUCCESSFUL CASE STUDIES IN OTOLARYNGOLOGY

Recently, several examples of multimodal nonopioid analgesia for mild to moderately painful otolaryngologic surgeries have demonstrated success. Many of these examples have used a quality improvement framework including components of a Plan-Do-Study-Act cycle addressing excess opioid prescribing. These examples illustrate the potential of quality improvement methodology to iteratively improve care for patients. The University of Nebraska conducted a series of studies that illustrate some of the potential benefits of incorporation of evidence-based best practices and iterative quality improvement.

In an initial pilot evaluation of prospectively collected data on adults who underwent outpatient thyroid, parathyroid, and parotid surgery they investigated the use of a multimodal analgesia strategy incorporating acetaminophen, ibuprofen, and gabapentin.<sup>19</sup> This study included 64 patients and found that 61% of patients were able to avoid postoperative opioid use on discharge. These authors rapidly expanded on this pilot study and published a follow-up of 588 patients soon afterward illustrating how an initial pilot study can rapidly expand. They identified that adherence with the multimodal pathway increased to 88% over time, whereas the need for postoperative opioid prescriptions reduced to 1.9%.<sup>20</sup> Furthermore, incorporating NSAIDs was safe and did not lead to an increase risk of bleeding.<sup>20</sup> Among 1702 patients undergoing thyroid and parathyroid surgery from a different institution, investigators found that prescriptions for opioids were reduced after initiation of preoperative patient education and the use of nonopioid medications.<sup>12</sup>

To understand how to apply some of these data to other procedures in otolaryngology it is necessary to understand the variation that exists in postoperative pain and opioid requirements. In one of the landmark studies that provides a framework for this question, investigators prospectively studied postoperative pain and opioid consumption in 70,764 patients undergoing 179 different operations.<sup>21</sup> Among these a total of nine otolaryngology operations were included. Eight of nine otolaryngologic operations were rated among the least painful with maximum pain scores of 2.3 to 4.4/10 points. These surgeries including septoplasty, thyroidectomy, facial fracture reduction, rhinoplasty, endoscopic sinus surgery, middle ear surgery, salivary gland surgery, and lymph node biopsy.<sup>21</sup> Tonsillectomy was the only otolaryngologic surgery identified as a high-pain surgery. These data indicate that most otolaryngologic surgery produces mild to moderate pain and that multimodal analgesia pathways, such as those used in the thyroid/parathyroid surgery examples, can be applied.

In highly painful operations, such as, tonsillectomy, other oral cavity/oropharyngeal surgery, and major head and neck oncologic surgery, opioids may be required in addition to other multimodal strategies. A retrospective cohort study of patients undergoing free tissue transfer for head and neck reconstruction analyzed a group of 28 patients receiving multimodal analgesia and 37 patients undergoing a standard opioid-based analgesia.<sup>22</sup> Patients receiving multimodal analgesia received preoperative patient counseling; preoperative oral acetaminophen and gabapentin; intraoperative acetaminophen; and postoperative acetaminophen, gabapentin, celecoxib, and ketorolac. Further analgesia involved intravenous fentanyl pushes for breakthrough pain. The number of morphine equivalent doses for the multimodal analgesia cohort was 10.0 compared with 89.6 in the control cohort. Postoperative bleeding was similar between the two groups. The median number of MME doses prescribed at discharge

was 0 for the multimodal analgesia cohort and 300 for the control cohort. This example shows the importance of a thorough treatment course beginning preoperatively and involving counseling and nonmedicinal measures.

Another example in highly painful head and neck cancer surgery undergoing free tissue transfer examined a simpler multimodal pathway incorporating COX-2 inhibitors. In this retrospective matched-cohort study of 147 patients, the effect of 200 mg of celecoxib scheduled twice daily through the feeding tube for a minimum of 5 days starting on postoperative Day 1 was investigated.<sup>17</sup> Oral opioids were offered to both patient cohorts in a scheduled manner and as needed and PRN intravenous opioids for severe pain that could be up-titrated depending on pain levels. Treatment with celecoxib was associated with significantly decreased mean use of intravenous and total opioids. Celecoxib patients used a mean of 1.5 mg of intravenous MME per day versus 5.3 mg of IV MME per day in the control group. Looking at cohorts that underwent the most common ablative procedure (composite oral resection), oral MME, intravenous MME, and total MME were all statistically significantly decreased in the celecoxib group compared with the noncelecoxib group. There were no statistically significant differences in the incidence of complications between the two groups. Of note, there was no difference in cardiovascular complications between the two groups.

Incorporation of Plan-Do-Study-Act agendas aimed at decreasing opioid prescriptions and subsequent consumption in the perioperative period require overcoming several barriers to become successful quality improvement initiatives. **Box 3** displays examples of potential barriers to quality improvement in perioperative pain control.

### GUIDELINES TO STANDARDIZE CARE

The final challenge is standardizing and disseminating evidence-based recommendations for postoperative pain control. Simply lowering the default reset prescription quantity for opioid prescriptions has changed practice. Investigators at Yale lowered the amount of pills autopopulated in the electronic medical record (EMR) when prescribing discharge analgesia from 30 to 12. They looked at preintervention and post-intervention prescriptions and found an overall decrease in opioids prescribed from 30 to 20, with no statistical significant increase in refill rates.<sup>23</sup> Furthermore, decreasing the amount of pills prescribed decreased consumption of opioids.

Another high-impact example used a quality improvement framework across multiple hospital systems in the Michigan Surgical Quality Collaborative. Investigators

#### Box 3

##### Potential barriers to quality improvement in perioperative pain control

Clinicians comfort using NSAIDs (nonselective or selective inhibitors) in the perioperative setting

Time to educate patients about multimodal analgesia

Need to develop systems to assess pain and refill medications for the minority of patients with high pain and/or opioid requirements after surgery

Cost of some multimodal analgesia strategies, such as liposomal bupivacaine

Patient perceptions that opioids are necessary

Patients hesitancy to dispose of unused opioids

Lack of collaboration among anesthesia, nurses, and surgeons in creating multimodal analgesic plans beginning preoperatively

**Box 4****Strategies for quality improvement in perioperative pain control**

- Incorporate multimodal analgesia for all patients unless contraindicated
  - Consider preventive analgesia with preoperative acetaminophen/NSAIDs/gabapentin
  - Use of long-acting local and/or regional anesthesia whenever possible
  - Scheduled acetaminophen
  - Scheduled NSAIDs (nonselective COX-1 and -2 inhibitors or selective COX-2 inhibitors)
  - Limit opioid prescribing if necessary
  - Limit the usage of preset postoperative order sets, which include PRN opioids
- Protocolize analgesia and opioid prescribing (update EMR default settings)
- Develop patient educational resources to standardize multimodal analgesia
- Educate patients about the risks of opioids including abuse and fatal overdose
- Educate patients about disposal of unused opioids
- Educate patients on the average number of opioids used by the general population after undergoing specific procedure
- Partner with other health care stakeholders (anesthesia, nurses, residents, pharmacists) to encourage implementation
- Ongoing monitoring of use of multimodal analgesia, opioid usage, patient pain, and satisfaction with pathway

designed guidelines for pain control and opioid prescribing for various general/vascular and gynecologic procedures and examined their impact in this statewide quality-improvement collaborative. Investigators found that after guideline implementation, prescription of postoperative opioids decreased in size from  $26 \pm 2$  pills in the preguideline period to  $18 \pm 3$  pills after the guidelines were released.<sup>24</sup> Opioid consumption also decreased, with no changes in satisfaction or pain scores.

In response to evidence that postoperative opioid prescribing guidelines decrease opioid prescribing without compromising patient satisfaction,<sup>18,25</sup> the American Academy of Otolaryngology – Head and Neck Surgery has sponsored a single specialty guideline directed at opioid and analgesic prescribing for acute postoperative pain in otolaryngology. These guidelines are targeted at common otolaryngology procedures; however, it is hoped that they will provide a framework that could be applied to less common procedures. Instituting prescribing recommendations for one procedure may result in decreased prescribing for other related procedures from spillover.<sup>24</sup>

**Box 4** synthesizes several quality improvement strategies in perioperative pain control that could be used including multimodal analgesia, lowering default quantities on the EMR, and postoperative opioid prescribing guidelines.

**SUMMARY**

Efforts to make pain control a quality metric to compare hospitals may have incentivized overuse of opioids in the past. Fortunately, in response to the opioid epidemic, these incentives have been refined to remove any enticement to prescribe opioids. Although previous efforts to improve patient satisfaction by improving pain control may have had unintended consequences, the quality improvement framework also provides techniques to respond to this crisis. Several surgical specialties, including otolaryngology, have demonstrated that quality improvement efforts using prescriber guidelines and multimodal analgesia can address postoperative pain, maintain patient satisfaction, and minimize the use of opioids.

**DISCLOSURE**

None.

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