Effective Reduction in Opioid Prescriptions for Ambulatory Lesion Excisions in Pediatric Patients

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Background: Childhood opioid consumption is potentially deleterious to cognitive development and may predispose children to later addiction. Opioids are frequently prescribed for outpatient surgery but may not be necessary for adequate pain control. We aimed to reduce opioid prescriptions for outpatient pediatric skin and soft tissue lesion excisions using quality improvement (QI) methods.
Methods: A multidisciplinary team identified drivers for opioid prescriptions. Interventions were provider education, improving computer order set defaults, and promoting non-narcotic pain control strategies and patient-family education. Outcomes included percentage of patients receiving opioid prescriptions and patient-satisfaction scores. Data were retrospectively collected for 3 years before the QI project and prospectively tracked over the 8-month QI period and the following 18 months.
Results: The percentage of patients receiving an opioid prescription after outpatient skin or soft tissue excision dropped significantly from 18% before intervention to 6% at the end of the intervention period. Patient-reported satisfaction with pain control improved following the QI intervention. Satisfaction with postoperative pain control was independent of closure size or receipt of a postoperative opioid prescription. Intraoperative use of lidocaine or bupivacaine significantly decreased the incidence of postoperative opioid prescription in both bivariate and multivariate analyses. Results were maintained at 18 months after the conclusion of the QI project.
Conclusion: Raising provider awareness, educating patients on expected postoperative pain management options, and prioritizing non-narcotic medications postoperatively successfully reduced opioid prescription rates in children undergoing skin and soft tissue lesion excisions and simultaneously improved patient-satisfaction scores. *(Plast Reconstr Surg Glob Open 2021;9:e3466; doi: 10.1097/GOX.0000000000003466; Published online 15 March 2021.)*

INTRODUCTION

Opioid abuse is a national epidemic, contributing to more than 19,000 deaths annually in the United States.[1,2] Adult patients used only 5%–59% of prescribed opioid pills, with up to 70% of patients neglecting to dispose of unused pills.[3] Although not as well-studied in children, opioid prescribing practices are highly variable in pediatric patients, and opioids are often prescribed in excess of pain levels.[4] Prescription opioids have a high potential for misuse and adverse effects; the recent increase in opioid-associated deaths in the pediatric population highlights the importance of opioid stewardship for all pediatric surgeons.[5–9] Moreover, over-prescribing adds to the number of opioid pills in public circulation, thus enabling drug diversion and opioid abuse.[10] Therefore, efforts should continue to be made to minimize excess opioid prescriptions while ensuring adequate pain control.

Quality improvement (QI) studies involve systematic implementation of evidence-based interventions and assessments aimed at immediate improvements in the process/delivery, outcome, or efficiency of healthcare.[11,12] QI initiatives are process-driven and utilize methods such as Plan-Do-Study-Act (PDSA) or

Design-Measure-Analyze-Improve-Control to cyclically define modifiable risk factors for an unwanted clinical outcome (eg, opioid overprescribing), collect baseline data, implement evidenced-based measures to address risk factors, analyze results, and adopt strategies to improve care.[13] This article reports our QI interventions that successfully reduced opioid prescriptions given to pediatric patients after outpatient skin and soft tissue lesion excisions. We describe low-cost and self-sustaining strategies that can be implemented in a variety of surgical settings and populations.

MATERIALS AND METHODS

Setting and Study Population

A multidisciplinary team consisting of a plastic surgeon, surgical resident, anesthesiologist, nurse manager, and perioperative nurse formed for an opioid prescription reduction initiative at the Children's Hospital of Philadelphia (CHOP), where approximately 45 outpatient soft tissue lesion excisions are done monthly at the Division of Plastic and Reconstructive Surgery. The study population included all pediatric plastic surgery patients aged 6 months to 18 years who underwent outpatient excision of a soft tissue lesion or cyst (as identified by surgery scheduling codes) by a plastic surgeon from January 2015 to March 2020. QI interventions were implemented from February 2018 to September 2018. An automated visual data dashboard was created and permitted ongoing data collection of primary outcomes to confirm maintenance of project goals. This study was exempt from IRB review and received support from the Center for Healthcare Quality and Analytics in conjunction with the Department of Surgery at CHOP. Support included a project manager and a data analyst to develop data tracking tools.

The team developed a data collection plan and identified all necessary resources to initiate our first Plan-Do-Study-Act cycle with the goal of reducing the number of patients receiving opioid prescriptions by 50% at the end of the 8-month implementation period (September 2018) while maintaining a high level of patient satisfaction with postoperative pain management. Data collection and analysis continued for 18 months following the QI intervention phase to ensure long-term maintenance of the target.

Identification of Drivers

A root cause analysis identified the following drivers of a postoperative opioid prescription in our project cohort: surgeon concerns of inadequate treatment of postoperative pain, the role of residents and the electronic medical record (EMR) in prescription practices, lack of family education on multimodal pain control, and variable family and patient expectations of postoperative pain.

QI Process

Identification of the key drivers at both the provider and patient level guided development of the following interventions. A primary driver of postoperative opioid prescription was surgeon concern for undertreating pain in this vulnerable population. In February 2018, this QI project was introduced at a faculty meeting and prompted a discussion of the variable prescribing patterns amongst individual surgeons. Although some surgeons rarely prescribed postoperative narcotics, others routinely prescribed 1 or more doses and instructed caregivers to use these only in the case of severe postoperative pain. Surgeons who prescribed opioids at higher rates were persuaded to discontinue prescriptions based on the success of their colleagues. In addition, the surgeons established a consensus regarding the maximum number of doses to be dispensed if an opioid was deemed necessary postoperatively per the surgeon's discretion.

In August 2018, a new procedure-specific ambulatory soft tissue lesion postoperative order set was updated and integrated into the current EMR. The key components include a prompt notifying providers that oxycodone is not routinely used for small lesions and automatic ordering of acetaminophen and ibuprofen that are dosed by weight. All surgeons recommended acetaminophen and ibuprofen for pain control, but most did not provide prescription orders for these before implementation of the new order set. The prescriptions provided weight-based dosing instructions, decreasing the chance of inappropriate dosing of these medications. Order set medication instructions and activity restrictions were provided as part of the new order set. All order set changes were reviewed with prescribing providers.

Patient-family education (PFE) materials were created to guide parents/guardians with recognizing and managing postoperative pain following skin or soft tissue excisions. The content was age-appropriate, targeting (1) baby and toddler, (2) pre-school and young child, and (3) older child and adolescent. Handouts focused on multimodal strategies for pain management such as distraction, comfort, and non-opioid medications (eg, acetaminophen and ibuprofen). The PFE materials also included developmentally appropriate cues to guide caregivers in recognition of pain, such as food or sleep refusal or high pitched cry in an infant or refusal to use the affected area of the body in a young child. Development of the new PFEs were our final QI intervention, released in September 2018. We encouraged staff discussion with families regarding pain management expectations at the initial surgical consultation, and multi-modal pain control strategies were reinforced when families contacted the office with questions.

Data Collection and Analysis

Primary outcomes included postoperative opioid prescription rate and patient/guardian satisfaction with postoperative pain control. A data visualization tool (QlikView; Radnor, Pa.) captured patient and surgical variables from an enterprise data warehouse containing information from the EMR (Epic; Verona, Wis.). QlikView tracks information regarding patient demographics, prescriber, surgeon, lesion closure size, patient-satisfaction score, number of opioid doses prescribed, intraoperative use of lidocaine or bupivacaine, patient satisfaction, and order set utilization. Outcome metrics were tracked using statistical process control (SPC) methods with generated

run-sequence plots that were grouped in monthly and quarterly units. Run-sequence plots generated upper and lower control limits for each measure, calculated as ± 3 SDs from the baseline mean. The data were continuously tested for special cause variation, defined as (1) one or more points outside the control limits, (2) run of 6 or more points on the one side of the baseline mean, (3) unidirectional trend of 7 or more consecutive points, or (4) any obvious non-random patterns in the data. Every run of 6 consecutive values or more above or below the baseline mean resulted in a baseline shift at the first value in the series, indicating special cause variation. Special cause variation was used to determine successful process-driven changes in our metrics of interest.

A total of 781 encounters had complete data for all variables of the multivariate analysis during the study period. Of these 781 encounters, 352 (45%) and 429 (55%) encounters happened before and after QI intervention, respectively. Any intervention after September 30, 2018 was considered post-QI intervention. The primary outcomes of postoperative opioid prescription and satisfaction with postoperative pain control were coded as binary variables (Yes/No). Predictors and covariates for both the primary outcomes included (1) whether the procedure was performed before or after QI intervention, (2) closure size, and (3) intraoperative lidocaine or bupivacaine use. Closure sizes were categorized as "large" if >3.0 cm (the cohort's 75th percentile closure size) and "small" if ≤3.0 cm. Additional covariates for the analysis of postoperative opioid prescription were patient age at the time of procedure and whether the lesion order set was utilized. The additional covariate for the analysis of satisfaction with postoperative pain control was whether opioids were prescribed postoperatively. Univariate and multiple logistic regression models were used to evaluate the unadjusted and adjusted associations, respectively, between the primary outcomes and the corresponding predictors and covariates.

Multicollinearity of independent variables was assessed by calculating Variance Inflation Factors (VIFs); VIF of >5 indicates significant concerns for multicollinearity.[14] Predictive accuracy of multiple logistic regression models was evaluated by calculating c-statistic, which is equivalent to the area under the receiver operating characteristic curve; c-statistic ≥ 0.7 indicates a good predictive accuracy.[15] Significance levels were 2-tailed and set at 0.05. Statistical analysis was performed using RStudio 1.2 (The R Foundation for Statistical Computing, Vienna, Austria).

RESULTS

Baseline Trends in Opioid Prescription
Before initiation of our QI project, the rate of surgeries with postoperative opioid prescription decreased 66% from 53% in 2015 to 18% in 2018 (Fig. 1). Special cause variation was detected in the run-sequence plot in May 2016, indicating a decrease in the percentage of opioid prescriptions below 3 SD from the baseline mean. Two additional special-cause variations were observed pre-QI: 1 was seen between July and August 2016, and another seen between May and June 2017.

Opioid Prescription Rates
The percentage of patients receiving an opioid prescription after outpatient lesion excision dropped 67% from 18% at the beginning of 2018 to 6% by end of the 8-month QI study period (Fig. 1). A shift from 18%–6% was observed at the time period between February and March 2018, which represents the first data point out of 6 required for special cause variation. Mean opioid prescription rate remained stable and below target goal for the duration of the QI study and the months following.

Quality of Multiple Regression Models
Independent variables in multiple logistic regression models showed no significant concern for multicollinearity (corrected VIF < 5 for all). Both multiple regression models for postoperative opioid prescription and satisfaction with postoperative pain control showed good predictive accuracy (C-statistic = 0.8 and 0.7, respectively).
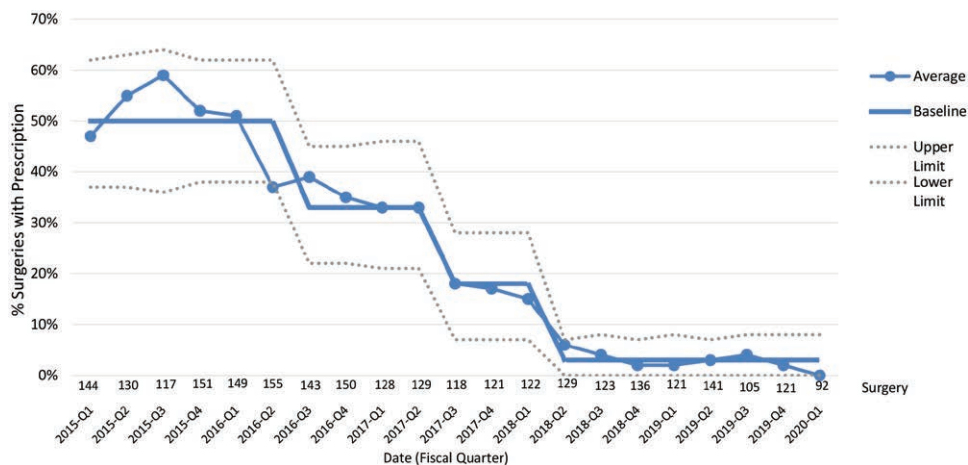

Fig. 1. Trend in opioid prescription rate (2015–2020).

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Table 1. Bivariate and Multivariate Analyses: Predictors of Postoperative Opioid Prescription

Predictor	OR [95% CI]	P	AOR [95% CI]	Adjusted P
QI Intervention: before (versus after)	5.80 [3.34, 10.07]	**<0.001**	4.60 [2.06, 11.71]	**<0.001**
Closure size > 3.0 cm	4.05 [2.06, 7.98]	**<0.001**	3.81 [1.85, 7.90]	**<0.001**
Use of lidocaine or bupivacaine	0.15 [0.07, 0.31]	**<0.001**	0.13 [0.04, 0.43]	**<0.001**
Use of lesion order set	0.66 [0.42, 1.02]	0.063	1.21 [0.59, 2.63]	0.611
Age at procedure	1.04 [1.00, 1.09]	**0.032**	1.00 [0.94, 1.07]	0.947
				C-statistic = 0.8

Significant associations at α = 0.05 were in bold. OR, odds ratio; AOR, adjusted odds ratio; 95% CI, 95% confidence interval; c-statistic, area under the receiver operating characteristic curve (AUC ROC).

Postoperative Opioid Prescription

Postoperative opioid prescription was nearly 5 times as likely before, compared with after, QI intervention, in both adjusted and unadjusted analyses (OR = 5.80 [3.34, 10.07], AOR = 4.60 [2.06, 11.71]; $P < 0.001$ for both). Compared with closure sizes ≤3.0 cm, closure sizes >3.0 cm were significantly associated with increased opioid prescription (OR = 4.05 [2.06, 7.98], AOR = 3.81 [1.85, 7.90]; $P < 0.001$ for both). Intraoperative use of lidocaine or bupivacaine significantly decreased the odds of postoperative opioid prescription in both bivariate and multivariate analyses (OR = 0.15 [0.07, 0.31], AOR = 0.13 [0.04, 0.43]; $P < 0.001$ for both). No significant adjusted associations existed between postoperative opioid prescription and either patient age at the time of surgery or use of lesion order set (AOR = 1.00 [0.94, 1.07] and 1.21 [0.59, 2.63]; $p = 0.947$ and 0.611, respectively). Table 1 summarizes the studied predictors of postoperative opioid prescription.

Satisfaction with Postoperative Pain Control

Satisfaction with patient pain control remained high and slightly increased during our study period (Fig. 2). Satisfaction with postoperative pain control was significantly lower pre-QI compared with post-QI intervention in both bivariate and multivariate analyses (OR = 0.37 [0.19, 0.75], $P = 0.006$; AOR = 0.33 [0.13, 0.75], $P = 0.011$). Intraoperative use of lidocaine or bupivacaine trended toward higher satisfaction on adjusted analysis, although this relationship did not meet the threshold for statistical significance (AOR = 3.99 [0.82, 14.64], $P = 0.052$). Satisfaction with postoperative pain control was independent of closure size and postoperative opioid prescription ($P > 0.1$) (Table 2).

DISCUSSION

In this study, we used QI methodology to significantly reduce the percentage of pediatric patients who had ambulatory skin and soft tissue lesion excisions discharged home with opioid prescriptions while maintaining high patient-satisfaction levels. The percentage of patients receiving an opioid prescription in our practice began to fall before our QI study. This trend could reflect a larger-scale increase in regulatory efforts to decrease opioid prescriptions in the outpatient setting in response to the opioid epidemic.[16–20] Additionally, other regulatory efforts such as scheduling changes for opioid medications, prescription drug monitoring programs, and insurance policy changes could have contributed to our pre-QI decline in opioid prescriptions.[14, 20–23] Anecdotally, parents were receptive to non-opioid strategies of pain control and physician reassurance of not needing opioids postoperatively. The emergence of both clinician awareness and regulatory opioid control efforts is likely to heighten overall provider and parental recognition of opioid over-prescribing and the associated adverse effects. This context may have primed our practice for success in reducing opioid prescriptions in this patient population.

The significantly higher opioid prescription rates in our practice before this QI project reveals an example of overprescribing. Previous literature demonstrates that physicians are likely to overprescribe opioid mediations in the outpatient setting, such as for soft tissue procedures of the hand and wrist.[24] Similar findings have been reported in the pediatric population, in addition to low rates of education on proper controlled substances disposal.[6] Educational interventions for providers and patients have
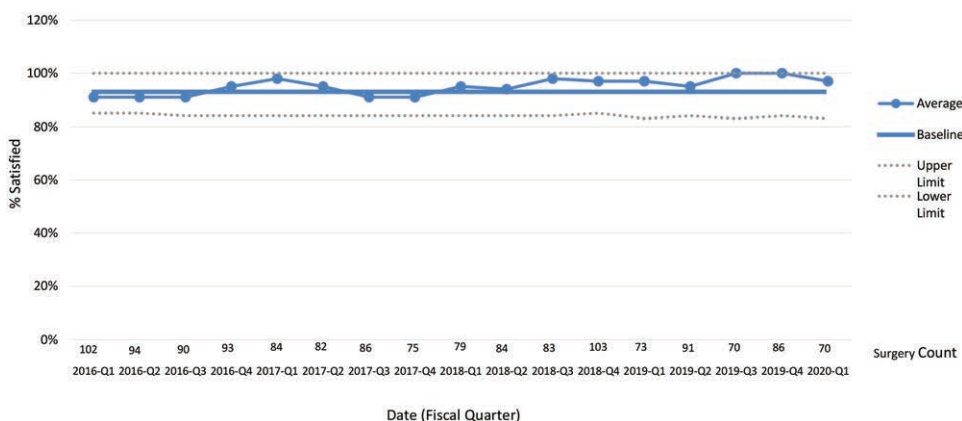

Fig. 2. Percentage of patients reporting positive satisfaction with pain control (2015–2020).

Table 2. Bivariate and Multivariate Analyses: Predictors of Satisfaction with Postoperative Pain Control

Predictor	OR [95% CI]	P	AOR [95% CI]	Adjusted P
QI Intervention: before (versus after)	0.37 [0.19, 0.75]	**0.006**	0.33 [0.13, 0.75]	**0.011**
Closure size > 3.0 cm	1.18 [0.43, 3.19]	0.748	1.17 [0.45, 3.69]	0.767
Use of lidocaine or bupivacaine	2.62 [0.76, 9.06]	0.128	3.99 [0.82, 14.64]	0.052
Postoperative opioid prescription	0.45 [0.17, 1.21]	0.115	2.27 [0.36, 46.46]	0.471
				C-statistic = 0.7

Significant associations at α = 0.05 were in bold.OR, odds ratio; AOR, adjusted odds ratio; 95% CI, 95% confidence interval; c-statistic, area under the receiver operating characteristic curve (AUC ROC).

shown promising results in addressing this issue, ranging from changes in prescribing guidelines for physicians to simple educational materials provided to patients.[25,26] In our study, surgeon discussion served the dual purpose of education and obtaining provider buy-in, which are both critical components of QI success. Importantly, a simple conversation to align practice patterns highlights a low-cost and low-burden method for opioid reduction that can be adapted at other institutions and for many other outpatient procedures. This practice-wide discussion also temporally matches the significant decrease in opioid prescription rate to our target goal in the early stages of our QI initiatives. Other considerations are hospital/institutional culture and personal beliefs on opioid prescribing, which have been reported as significant influencers of opioid prescribing practice.[27] Further work on how to standardize discussion of perioperative care among surgeons may provide a more definitive framework for widespread adaptation of clinical practice changes and other QI initiatives.

Patient reported satisfaction with pain control served as a balancing measure to ensure that our decrease in opioid prescriptions were not harmful for patients. Prior studies on opioid prescriptions and patient satisfaction have found that providers often prescribe more pills than required for adequate pain control and patient satisfaction.[16,17] In our study, maintenance of high patient/guardian satisfaction demonstrates that more than 90% of children undergoing outpatient lesion excisions do not require opioids for pain management, adding to current evidence. The authors are not aware of any included patients who were seen postoperatively in the emergency room or as an unscheduled outpatient clinic visit due to inadequate pain relief. High satisfaction may also reflect increased communication between providers and families that arises from deliberate conversation of pain control modalities. The use of non-opioid medications, namely acetaminophen and ibuprofen, likely rose in compensation. Although not tracked in our study, a compensatory rise in non-opioid medication usage would be consistent with findings from previous studies.[28] Future studies tracking the use of non-opioid medications in the context of decreased opioid administration could better determine relative opioid-sparing effects of different non-opioid medications. Evidence suggests that multidisciplinary analgesia treatments incorporating non-opioid pharmacological and integrative non-pharmacological therapies can decrease opioid use and related adverse side-effects in the perioperative period.[29–31] For this reason, age-appropriate distraction techniques and therapeutic touch were

the initial strategy of multi-modal pain relief presented to caregivers in the new PFE materials.

We found that larger closure sizes (>3.0 cm) had a higher likelihood of opioid prescription, but this should not be interpreted as an absolute threshold that all patients with closures >3 cm require opioids postoperatively. In fact, patients with closure sizes of 3–5 cm had an opioid prescription rate of 6% in the post-QI period, and patients with closure sizes of 6–15 cm had varying opioid prescription rates of 0%–67% (data not shown). Thus, the senior author routinely assures families that anticipated closure size up to 5–6 cm can be well managed with non-opioid modalities and discusses treatment modalities with families for shared decision-making in longer closure sizes. More detailed research on opioid utilization for larger soft tissue procedures may provide more explicit clinical practice guidelines.

This study was limited by its methodological design of being a QI initiative to track easily attainable information within the EMR. Thus, we did not prospectively document opioid doses taken or non-opioid medication consumption. Without the ability to track opioid consumption, we could not address unused opioid doses. Additionally, we did not stratify size of closure as a proportion of the patient's total body surface area, nor was anatomical location of the lesion considered in our analysis. We recognize that a 2-cm excision with tight closure on a toddler could be subjectively more painful than a 2-cm excision in an area with significant skin laxity on an adolescent.

Other than the time required to hold team meetings, which were often held virtually, and the configuration of data collection tools, QI measures outlined in this article were low-cost and conferred little opportunity costs for key stakeholders in the QI process. Therefore, we anticipate that other institutions could successfully implement similar QI measures with comparable results. Additionally, the results have been maintained for an additional 18 months without any further interventions by the project team.

CONCLUSIONS

We describe multiple self-sustaining QI interventions for addressing unnecessary opioid prescriptions for pediatric outpatient soft tissue lesion excision patients. We used strategies of explicit discussion, EMR changes, and PFE materials to raise surgeon awareness and align practice patterns, emphasize non-opioid medications, and educate patients/family on expected postoperative pain and multimodal pain management. These interventions significantly reduced opioid prescription rates in children undergoing ambulatory soft tissue lesion excisions, and maintained high patient-satisfaction scores.

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REFERENCES

1. Rudd RA, Aleshire N, Zibbell JE, et al; National Center for Injury Prevention and Control, CDC. Increases in drug and opioid overdose deaths – United States, 2000–2014. *MMWR Morb Mortal Wkly Rep.* 2016;64:1378–82.
2. Traynor K. FDA advisers support rescheduling of hydrocodone products. *Am J Health Syst Pharm.* 2013;70:383–384.
3. Feinberg AE, Chesney TR, Srikandarajah S, et al; Best Practice in Surgery Group. Opioid use after discharge in postoperative patients: A systematic review. *Ann Surg.* 2018;267:1056–1062.
4. Horton JD, Munawar S, Corrigan C, et al. Inconsistent and excessive opioid prescribing after common pediatric surgical operations. *J Pediatr Surg.* 2019;54:1427–1431.
5. Gaither JR, Shabanova V, Leventhal JM. US National trends in pediatric deaths from prescription and illicit opioids, 1999–2016. *JAMA Netw Open.* 2018;1:e186558.
6. Van Cleve WC, Grigg EB. Variability in opioid prescribing for children undergoing ambulatory surgery in the United States. *J Clin Anesth.* 2017;41:16–20.
7. Monitto CL, Hsu A, Gao S, et al. Opioid prescribing for the treatment of acute pain in children on hospital discharge. *Anesth Analg.* 2017;125:2113–2122.
8. Harbaugh CM, Lee JS, Mei Hu H, et al. Persistent opioid use among pediatric patients after surgery. *Pediatrics.* 2018;141:e20172439.
9. Bennett KG, Harbaugh CM, Hu HM, et al. Persistent opioid use among children, adolescents, and young adults after common cleft operations. *J Craniofac Surg.* 2018;29:1697–1701.
10. Allen JD, Casavant MJ, Spiller HA, et al. Prescription opioid exposures among children and adolescents in the United States: 2000–2015. *Pediatrics.* 2017;139:e20163382.
11. Casarett D, Karlawish JH, Sugarman J. Determining when quality improvement initiatives should be considered research: Proposed criteria and potential implications. *JAMA.* 2000;283:2275–2280.
12. Lynn J, Baily MA, Bottrell M, et al. The ethics of using quality improvement methods in health care. *Ann Intern Med.* 2007;146:666–673.
13. Girdler SJ, Glezos CD, Link TM, et al. The science of quality improvement. *JBJS Rev.* 2016;4:e1 (E-pub ahead of print).
14. Hosmer DW Jr, Lemeshow S, Sturdivant RX. *Applied Logistic Regression.* Hoboken, N.J.: John Wiley & Sons; 2013.
15. Sheather S. *A Modern Approach to Regression with R.* New York, N.Y.: Springer Science & Business Media; 2009.
16. Hart AM, Broecker JS, Kao L, et al. Opioid use following outpatient breast surgery: Are physicians part of the problem? *Plast Reconstr Surg.* 2018;142:611–620.
17. Rose KR, Christie BM, Block LM, et al. Opioid prescribing and consumption patterns following outpatient plastic surgery procedures. *Plast Reconstr Surg.* 2019;143:929–938.
18. Cardona-Grau D, Bush RA, Le HK, et al. Reducing opioid prescriptions in outpatient pediatric urological surgery. *J Urol.* 2019;201:1012–1016.
19. Donohoe GC, Zhang B, Mensinger JL, et al. Trends in postoperative opioid prescribing in outpatient pediatric surgery. *Pain Med.* 2019;20:1789–1795.
20. Baker DW. History of the joint commission's pain standards: Lessons for today's prescription opioid epidemic. *JAMA.* 2017;317:1117–1118.
21. García MC, Dodek AB, Kowalski T, et al. Declines in opioid prescribing after a private insurer policy change – Massachusetts, 2011–2015. *MMWR Morb Mortal Wkly Rep.* 2016;65:1125–1131.
22. Pomerleau AC, Nelson LS, Hoppe JA, et al. The impact of prescription drug monitoring programs and prescribing guidelines on emergency department opioid prescribing: A multi-center survey. *Pain Med.* 2017;18:889–897.
23. Frieden TR, Houry D. Reducing the risks of relief—The CDC opioid-prescribing guideline. *N Engl J Med.* 2016;374:1501–1504.
24. Rodgers J, Cunningham K, Fitzgerald K, et al. Opioid consumption following outpatient upper extremity surgery. *J Hand Surg Am.* 2012;37:645–650.
25. Rose P, Sakai J, Argue R, et al. Opioid information pamphlet increases postoperative opioid disposal rates: A before versus after quality improvement study. *Can J Anaesth.* 2016;63:31–37.
26. Stanek JJ, Renslow MA, Kalliainen LK. The effect of an educational program on opioid prescription patterns in hand surgery: A quality improvement program. *J Hand Surg Am.* 2015;40:341–346.
27. Baruch AD, Morgan DM, Dalton VK, et al. Opioid prescribing patterns by obstetrics and gynecology residents in the United States. *Subst Use Misuse.* 2018;53:70–76.
28. Harrison ML, Walsh TL. The effect of a more strict 2014 DEA schedule designation for hydrocodone products on opioid prescription rates in the United States. *Clin Toxicol (Phila).* 2019;57:1–9.
29. Wren AA, Ross AC, D'Souza G, et al. Multidisciplinary pain management for pediatric patients with acute and chronic pain: A foundational treatment approach when prescribing opioids. *Children (Basel).* 2019;6:33.
30. Gritsenko K, Khelemsky Y, Kaye AD, et al. Multimodal therapy in perioperative analgesia. *Best Pract Res Clin Anaesthesiol.* 2014;28:59–79.
31. Friedrichsdorf SJ. Contemporary pediatric palliative care: Myths and barriers to integration into clinical care. *Curr Pediatr Rev.* 2017;13:8–12.