



ELSEVIER

Contents lists available at ScienceDirect

JSES International

journal homepage: www.jseinternational.org

What do patients think about opioids? a survey of patient perceptions regarding pain control after shoulder surgery



Vani Sabesan, MD^{a,*}, Mirelle Dawoud, MS^b, Kiran Chatha, MD^a, Sandra Koen, ATC^a,
Laila Khoury, BS^b

^a Levitetz Department of Orthopedic Surgery, Cleveland Clinic Florida, Weston, FL, USA

^b Charles E Schmidt School of Medicine, Florida Atlantic University, Boca Raton, FL, USA

ARTICLE INFO

Keywords:

Opioid medication
Opioid dependence
Shoulder surgery
Patient perceptions
Patient education
Pain management

Level of evidence: Survey Study; Patients

Background: There is an increasing need to understand what barriers are present to reduce opioid consumption in orthopedic practice. The purpose of this study was to better understand patient perceptions and understanding of opioid use after shoulder surgery.

Methods: Eighty-five patients who underwent shoulder surgery anonymously completed a 27-question survey adapted from the Maryland Public Opinion Survey on Opioids with additional demographics. The patients were asked about pain expectations after surgery, use of and access to opioids, opioid perceptions, and information provided regarding safe use, storage, and disposal of opioids.

Results: When asked about receiving information regarding opioids, only 36% of the patients reported having a conversation with their physician. When asked about appropriate use, 10% agree it is permissible to take more than the recommended dosage of prescription narcotics if they are feeling more pain than usual and 8.5% of the patients reported taking an opioid to get high multiple times in the past year. Furthermore, a majority agreed that opioids may lead to other substance abuse with 76% reporting the risk of harm to be great, and only 55% believing that opioid abuse may lead to overdose or death.

Conclusions: Surgeons need to be aware that most patients expect to have significant pain after shoulder surgery and expect to be given necessary and continued amounts of opioids. This highlights the need for better counseling and innovative nonopioid pain management protocols. At the institutional level, more effort needs to be made on providing adequate education and disposal mechanisms to help reduce diversion and misuse.

© 2021 The Authors. Published by Elsevier Inc. on behalf of American Shoulder and Elbow Surgeons. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

In 2001, the Joint Committee on Accreditation of Healthcare Organizations released new pain management standards which instituted pain as the fifth vital sign.¹⁸ As a result, most physicians became acutely aware of patient pain levels and placed greater importance on the need for treatment. Moreover, treatment goals shifted from simply managing postoperative pain to eliminating it entirely. Given their efficacy, many surgeons turned to opiates as the first-line treatment for acute and chronic musculoskeletal pain. Another major driving force in the rise of opioid prescriptions was patients' anticipation of pain and expectation for large amounts of opioid prescriptions. In addition, hospital reimbursement is tied to the Hospital Consumer Assessment of Healthcare Providers and Systems survey, part of which ask patients to subjectively assess the

pain management provided by physicians.^{18–21} The inclusion of subjective pain management questions in this survey also incentivized physicians to prescribe opioids. This shift in thinking caused a drastic increase in both the number of opiates prescribed and their scope of use, leading to a nationwide crisis of opioid overuse and dependence.

Beginning in the 1990s, pharmaceutical companies aggressively marketed opioids not only to physicians but directly to the public as well as for all types of pain, including subacute and chronic pain such as that associated with arthritis.¹⁷ The risk of dependence was greatly understated, with addiction potential advertised as less than 1%.¹⁷ This campaign of active misinformation on the part of pharmaceutical companies led to a change in how patients viewed opiates, with many underestimating the risk associated with use. From 2003 to 2010, 1 study showed that nearly 50% of opioid naïve patients were discharged from the hospital with an opioid prescription postoperatively.⁵ This rise in opioid prescribing has led to a subsequent elevation in opioid addiction and abuse—with prescription opioids being misused by up to 29% of patients.²¹ Opioid

The Cleveland Clinic Institutional Review Board approved this study (FLA 17-022).

* Corresponding author: Vani Sabesan, MD, Levitetz Department of Orthopedic Surgery, Cleveland Clinic Florida, 2950 Cleveland Clinic Blvd, Weston, FL 33132, USA.

E-mail address: Sabes001@gmail.com (V. Sabesan).

<https://doi.org/10.1016/j.jseint.2020.12.019>

2666-6383/© 2021 The Authors. Published by Elsevier Inc. on behalf of American Shoulder and Elbow Surgeons. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

abuse is deadly; the number of opioid-related deaths nearly quadrupled between the years of 2000 and 2015, and currently, 130 Americans are dying each day from opioid overdoses, more than at the height of the Vietnam War.⁸

It has been well established that orthopedic surgeons have been among the highest prescribers of postoperative opioids.²⁰ After orthopedic surgery, patients have been found to experience chronic pain for up to 2 years.²² Patients assume that orthopedic trauma will be quite painful and expect that their pain will be appropriately addressed. Preoperative patient education is proven to have a significant effect on the duration of opioid consumption post-operatively.^{1,15–17,23} However, prior studies have suggested that opioid medication does not improve how patients rate their post-operative healthcare experience.⁶ This raises 2 important questions: how do patients perceive opioid medications and what can orthopedic surgeons do to adequately control pain and improve patient experience, while also decreasing the use of opioid prescriptions? Knowledge of this sort could demonstrate insight in the implementation of prescribing strategies and provide an improved preoperative educational approach to reduce opioid diversion and misuse.

The purpose of the present study is to evaluate patient perceptions of opioid medications for pain control. The hypothesis is that if patients expect to have high levels of postoperative pain, they will be more likely to believe that the pain can only be managed appropriately with opioid medications. We predicted that patients in the current climate would be aware of opioid use but unaware of alternative pain management options or appropriate utilization of these medications.

Methods

This is a cross-sectional study that looked at eighty-five patients who were anonymously surveyed using a 27-question survey adapted from the Maryland Public Opinion Survey on Opioids. Inclusion criteria included patients who presented at preoperative consultation with a shoulder-related complaint to a sports medicine or shoulder specialist at a single institution over a 2-year period. Patients were excluded if they had already undergone shoulder surgery before the survey. Patients who could not read or speak English were excluded from the study. Patients completed an anonymous survey on their smartphones or an iPad, and the provided data were recorded in a Research Electronic Data Capture database. Questions were presented exclusively in a multiple-choice or Likert scale format (Appendix 1). The first section of the questionnaire (6 questions) recorded demographic information such as age, gender, highest level of education, annual household income, race, and ethnicity (Appendix 1).

The following section (7 questions) asked patients to predict their future pain based off their beliefs and perception of pain after an orthopedic shoulder surgery and whether they felt they would need opioid medications to treat that pain. This section asked patients to rate the pain they would expect at different time intervals post-operatively from 0 to 10 with 10 being the worst pain they have ever experienced. In addition, this section included questions about beliefs regarding problems with opioid consumption in the United States. The survey included questions on consumption habits of participants, abuse of narcotics to get high, and misuse of opioids. The survey also includes a series of questions (12 questions) regarding the dangers of opioids. In this section, the participants reported all of the dangers they believe are associated with prescription, their beliefs regarding narcotic use combined with other medications and drugs, as well as how much risk there is for harm with use.

In the final section (10 questions), patients were asked to disclose how much they have been educated about opioids.

Participants were also asked about opioid abuse, taking prescription narcotics to get high and how easy it would be to obtain opioids. Participants then responded to whether they have seen or heard any information regarding safe storage, disposal of opioids, or about the dangers of prescription narcotics from their physicians. Finally, participants reported their own personal usage of narcotics.

Statistical analyses

Categorical variables were summarized in percentages of responses (%). Continuous variables were summarized using median (m) with standard deviations. The Fisher exact test and independent-sample t tests were used to examine differences on demographics. A P value less than 0.05 was considered statistically significant. Descriptive statistics were summarized for each question that assessed beliefs about pain, prescription opioids, and beliefs about opioid risks. The data were further analyzed for significant factors that correlated response to demographic variables using regression analyses.

Results

Eighty-five anonymous surveys were completed by patients who presented for preoperative consultation at an orthopedic clinic. Demographic variables of the cohort are reported in Table 1. Patients reported pain levels to be an average of 7.55 (± 2.13) at 24 hours, and this decreased to 5.1 (± 2.47) and 1.80 (± 2.50) at 1 week and 1 month, respectively (Fig. 1). Seventy-two percent of patients agreed they would feel pain after surgery and 76.4% believed they should be prescribed opioid medications to control their pain after surgery. Furthermore, 53.6% of patients believe that they should receive narcotic medications for as long as they feel they may need them.

Within this cohort, 87.5% of patients believe that narcotic medications are misused. When asked how concerned participants

Table 1
Demographic characteristics of survey participants.

Demographic characteristics	Percentage (n = 85)
Gender	
Female	51.8%
Male	48.2%
Age group	
18-29	3.6%
30-45	5.4%
46-60	30.4%
61-75	39.3%
75 and up	21.4%
Highest level of education	
Some high school	1.8%
High school graduate	8.9%
Some college	28.6%
Bachelor's degree	44.6%
Masters or professional degree	16.1%
Annual household income	
Less than \$25,000	7.7%
\$25,000-\$50,000	25%
\$50,000-\$75,000	17.3%
\$75,000-\$100,000	13.5%
over \$100,000	36.5%
Race	
White/Caucasian	80%
African American	12.7%
Asian	1.8%
Multiracial	1.8%
Other	3.6%
Ethnicity	
Hispanic	12.5%
Non-Hispanic	87.5%

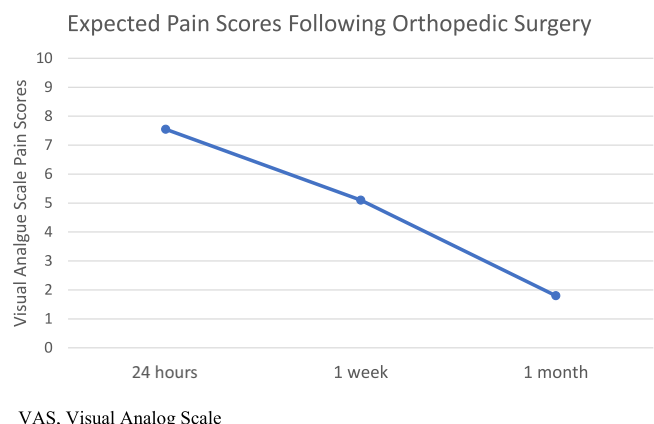


Figure 1 Patient-reported expected visual analog scale pain scores after an orthopedic surgery at 24 hours, 1 week, and 1 month postoperatively.

were with prescription narcotic abuse in their communities 60.7% responded either concerned or very concerned. Respondents were asked what age groups they believe to be the most likely to misuse these medications and 42.9% answered between the ages 18 and 25 years, while 35.7% answered between the ages 26 and 45 years. Twenty-one percent of patients personally knew someone who uses or has used prescription drugs to get high. When asked if they had taken opioids exactly as prescribed, 37.5% reported they should be taken exactly as the physician prescribed.

Eighty percent of patients believed addiction is a risk when taking opioids. Furthermore, a majority also believed that they may lead to other substance abuse. Only 55% of patients reported to believe that opioid abuse may lead to overdose or death. When asked about safety of opioids, 76% of patients reported the risk of harm to be great. They were then asked whether it is dangerous to mix narcotics with alcohol, sleep medications, or anti-anxiety medications in which nearly all patients agreed. 17 percent of patients reported it would be acceptable for someone to take prescription drugs that were not prescribed to them. Ten percent agreed it is permissible to take more than the recommended dosage of prescription narcotics if they are feeling more pain than usual, and 23.1% of patients agreed that getting high with prescription narcotics would be safer than with street drugs. Overall, half of the patients believed that prescription narcotics are dangerous (Fig. 2). Furthermore, 14.3% report that prescription opioids are safer than marijuana, 62.5% report safer than heroin, 55.4% report safer than methamphetamines, and 57.1% report safer than cocaine. Patients reported that within the past 12 months, 40.4% of patients indicated that they have seen or heard of information regarding safe storage of prescription drugs. When asked to check all that apply regarding storage and disposal of prescription narcotic medications, the responses were very widespread, Figure 3a and b.

When asked about where people taking opioids may get these medications, most participants selected response was that family or friends, followed by doctors, and then by stealing from family or friends (Fig. 4). Forty-seven percent of participants stated it would be easy for someone to get prescription opioid medications from a doctor, friend, or family member to get high. Thirty percent of patients report receiving information about the dangers of prescription narcotic medications at their doctor’s offices (Fig. 5). When asked about self-reported consumption patterns, 13% percent reported taking a prescription narcotic that was not prescribed to them, and during the past year, 5.7% reported taking it 3 or more

Responses When Asked About Safety of Opioids

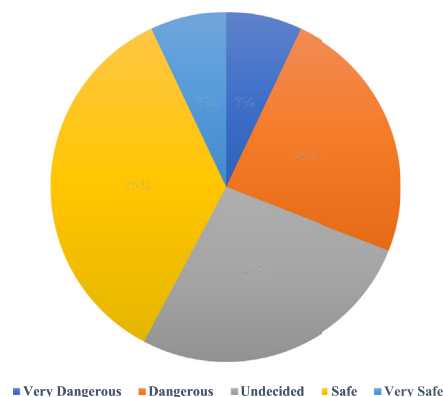


Figure 2 Patients' responses when asked if opioid medications are dangerous or safe for use in managing pain.

times without having them prescribed. Eight percent of patients reported taking prescription opioids for the feeling of getting high more than once.

Discussion

This study illustrates that patients who underwent orthopedic surgery and on sports medicine still believe there is extreme pain after shoulder surgery that warrants need for these opioid medications. This is consistent with our hypothesis that these orthopedic patients believe that their postoperative pain can only be managed appropriately with opioid medications given the high level of pain expectations. Our results show that 75% of patients expected to take opioids after surgery and more than two thirds of our patient population reported not having a conversation with their physician regarding opioids or alternatives. Studies assessing patients' perceptions of opioids in other fields have found similar results, whereby patients report that they feel opioids are a valid option for their pain management.^{1,7,14,19} Despite such perceptions, other studies have found associations between postoperative opioid use with lower satisfaction, poorer physical function, and greater pain intensity.^{1,4,10–12} This explicitly expresses the need for preoperative patient education about the risk and benefits of opioid use.

Recently, there has been a focus on improving patient education to help curtail opioid use and ultimately abuse among orthopedic surgery patients.^{1,15–17,23} Some studies have also proposed valid and applicable protocols such as reducing opioid prescribing, offering alternate nonopioid options, integrating better patient education or a combination of the 3 to increase patient engagement and help reduce opioid use.^{2,13,16–18} Furthermore, it was found that the majority of orthopedic subspecialties have been over-prescribing to patients and recent studies have shown that providing disposal mechanisms for opioids can eliminate them from circulation.^{3,9,20,21,23} Our study shows when patients were asked to check all that apply regarding storage and disposal of prescription narcotic medications, the responses were very widespread, Figure 3a and b, reinforcing the gap of education on proper disposal mechanisms that can be addressed.

With orthopedic surgeons being among the highest prescribers of opioids, concentration on such methods should be at the forefront to reduce the demand for opioids. Understanding what patients perceive regarding postoperative opioid usage is critical for orthopedic shoulder surgeons to contribute their efforts in the battle

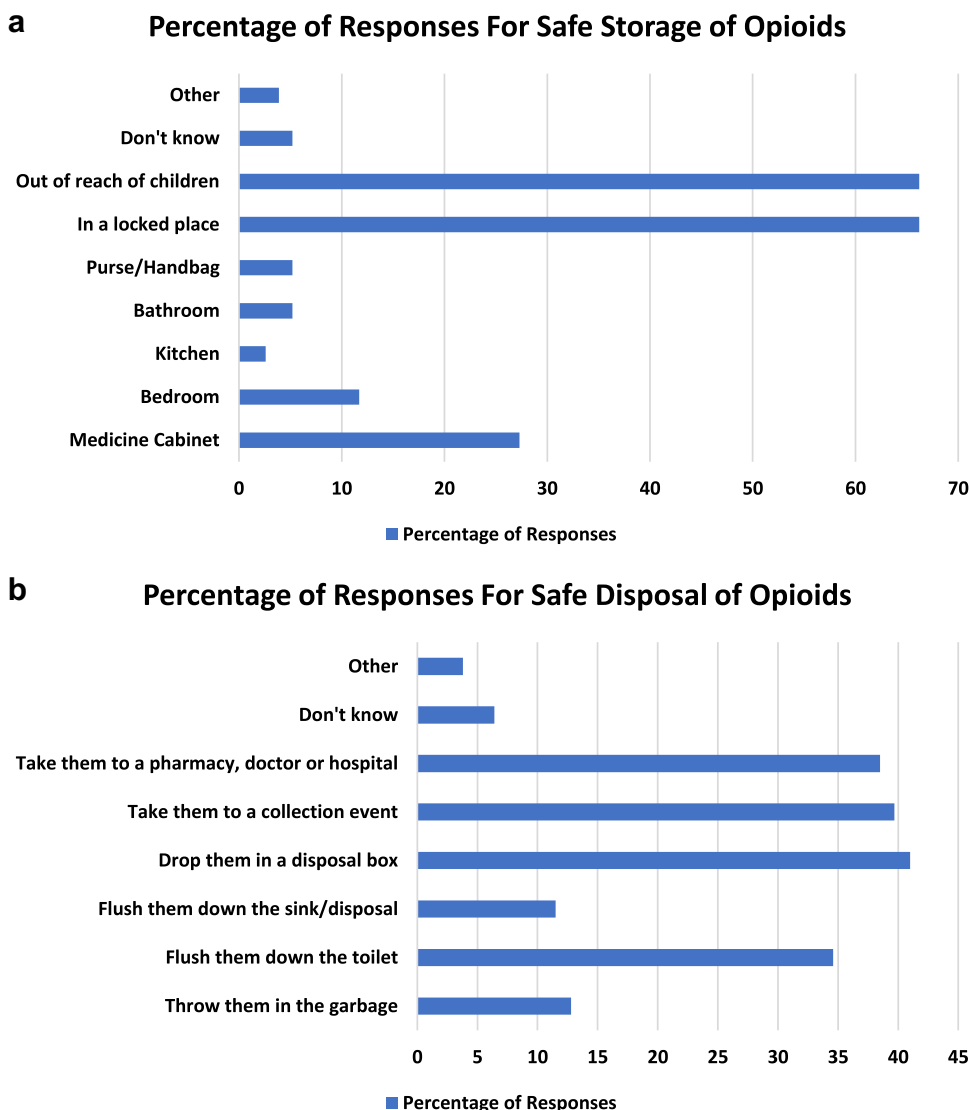


Figure 3 Patient responses for storage and disposal of narcotic medications. (a) Percentage of responses to having seen or heard of information regarding safe storage of narcotics in the past 12 months. (b) Percentage of responses to having seen or heard of information regarding safe disposal of narcotics in the past 12 months.

against opioids. Future studies and efforts need to be made to increase education for patients and provide them with alternative avenues to manage their pain. Recent focus has been on including preoperative education as well as specialized discharge instructions to aid in these efforts and have found success.²³ Another more recent study has furthered described a combined preoperative education and multimodal pain management protocol that nearly eliminates the need for opioids in shoulder arthroplasty.¹³ Our study suggests variability in the understanding of disposal mechanisms which should be taken under consideration for inclusion in these educational practices. And, futures studies should continue to investigate its applicability to do so. As for now, it seems that by integrating education, adjusting expectations, and working with pain management subspecialties, it may be possible to reduce opioid consumption after orthopedic procedures for higher-risk patients.

While this study brings to light some important conclusions regarding patient’s perceptions of opioids, it is not without limitations. There are limitations that are inherent to a survey study, whereby minimal participant specific data were included to

respect anonymity, such as smoking history, insurance type, or patient history associated with chronic pain. These may impact survey results and were not available for further subanalyses. In addition, there may have been inherent bias in the question design, as our survey was not previously validated. This cohort excluded patients who could not speak or read English, which may undermine preoperative educational approaches, but can be an avenue for further investigation with the inclusion of surveys in other languages. Other possibly confounding variables may include the variability among the different types of shoulder injuries and various stages of treatment. The survey response among a broad variety of shoulder types may not be relevant to more specific surgery types or to orthopedics as a whole. As so, future studies can analyze these surveys in the context of more specific types of surgeries, patients with comorbidities, or specific risk factors to evaluate for difference in perception based on these specific factors. In addition, because the survey was conducted at 1 institution, the applicability may be limited to regional interpretations.

Where patients perceive narcotics come from

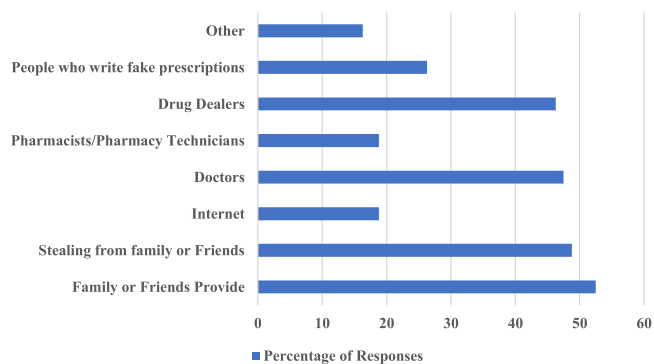


Figure 4 Patient responses for where people can get prescription opioid medications to get high.

Responses When Asked About Receiving Opioid Information from their Doctor

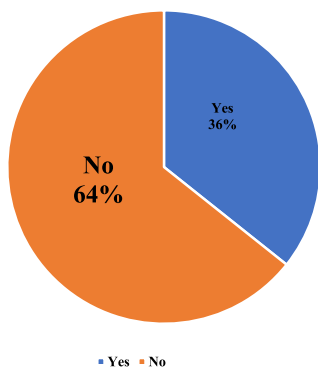


Figure 5 Patient responses when asked if they have had a conversation with their doctor regarding opioid medications.

Conclusions

In order to properly counsel patients on postoperative opioid use and pain management, surgeons must first understand their patients' expectations regarding both pain and postoperative opioid usage. Using a survey of patient perceptions, we found that the majority of orthopedic surgery patients expect to have significant pain after surgery and expect to be given necessary and continued amounts of opioids. Patients are unaware of appropriate opioid use, storage, and disposal and that further education needs to be integrated into our patient counseling. Patients also need to be counseled regarding alternative pain management options as the majority believes they should be prescribed opioids after a surgical procedure. At the institutional level, it seems that more effort needs to be made on providing adequate disposal mechanisms to help reduce diversion.

Disclaimers:

Funding: No funding was disclosed by the author(s).

Conflicts of interest: The authors, their immediate families, and any research foundations with which they are affiliated have not received any financial payments or other benefits from any commercial entity related to the subject of this article.

References

- Bargon CA, Zale EL, Magidson J, Chen N, Ring D, Vranceanu AM. Factors Associated With Patients' Perceived Importance of Opioid Prescribing Policies in an Orthopedic Hand Surgery Practice. *J Hand Surg Am* 2019;44:340.e1-8. <https://doi.org/10.1016/j.jhsa.2018.06.118>.
- Becchi C, Al Malyan M, Coppini R, Campolo M, Magherini M, Boncinelli S. Opioid-free analgesia by continuous psoas compartment block after total hip arthroplasty. A randomized study. *Eur J Anaesthesiol* 2008;25:418-23. <https://doi.org/10.1017/S026502150700302X>.
- Berglund DD, Rosas S, Kurowicki J, Mijic D, Levy JC. Effect of opioid dependence or abuse on opioid utilization after shoulder arthroplasty. *World J Orthop* 2018;9:105-11. <https://doi.org/10.5312/wjo.v9.i8.105>.
- Bot AGJ, Bekkers S, Arnstein PM, Smith RM, Ring D. Opioid use after fracture surgery correlates with pain intensity and satisfaction with pain relief. *Clin Orthop Relat Res* 2014;472:2542-9. <https://doi.org/10.1007/s11999-014-3660-4>.
- Clarke H, Soneji N, Ko DT, Yun L, Wijeyesundera DN. Rates and risk factors for prolonged opioid use after major surgery: Population based cohort study. *BMJ* 2014;348:g1251. <https://doi.org/10.1136/bmj.g1251>.
- Etcheson JI, Gwam CU, George NE, Virani S, Mont MA, Delanois RE. Opioids Consumed in the Immediate Postoperative Period Do Not Influence How Patients Rate Their Experience of Care After Total Hip Arthroplasty. *J Arthroplasty* 2018;33:1008-11. <https://doi.org/10.1016/j.arth.2017.10.033>.
- Glaser GE, Kalogera E, Kumar A, Yi J, Destephano C, Ubl D, et al. Outcomes and patient perspectives following implementation of tiered opioid prescription guidelines in gynecologic surgery. *Gynecol Oncol* 2020;157:476-81. <https://doi.org/10.1016/j.ygyno.2020.02.025>.
- Jones J, Southerland W, Catalani B. The Importance of Optimizing Acute Pain in the Orthopedic Trauma Patient. *Orthop Clin North Am* 2017;48:445-65. <https://doi.org/10.1016/j.ocl.2017.06.003>.
- Kim N, Matzon JL, Abboudi J, Jones CM, Kirkpatrick W, Leinberry C, et al. A prospective evaluation of opioid utilization after upper-extremity surgical procedures: Identifying consumption patterns and determining prescribing guidelines. *J Bone Joint Surg Am* 2016;98:e89. <https://doi.org/10.2106/JBJS.15.00614>.
- Menendez ME, Ring D. Factors Associated with Greater Pain Intensity. *Hand Clin* 2016;32:27-31. <https://doi.org/10.1016/j.hcl.2015.08.004>.
- Menendez ME, Ring D, Bateman BT. Preoperative Opioid Misuse is Associated With Increased Morbidity and Mortality After Elective Orthopaedic Surgery. *Clin Orthop Relat Res* 2015;473:2402-12. <https://doi.org/10.1007/s11999-015-4173-5>.
- Nota SPFT, Spit SA, Voskuyl T, Bot AGJ, Hageman MGJS, Ring D. Opioid Use, Satisfaction, and Pain Intensity After Orthopedic Surgery. *Psychosomatics* 2015;56:479-85. <https://doi.org/10.1016/j.psych.2014.09.003>.
- Sabesan VJ, Chatha K, Koen S, Dawoud M, Gilot G. Innovative patient education and pain management protocols to achieve opioid-free shoulder arthroplasty. *JSES Int* 2020;4:362-5. <https://doi.org/10.1016/j.jseint.2020.01.005>.
- Scherer M, Weiss L, Kamler A, George MC, Navis A, Gebhardt Y, et al. Patient recommendations for opioid prescribing in the context of HIV care: findings from a set of public deliberations. *AIDS Care* 2019;32:1471-8. <https://doi.org/10.1080/09540121.2019.1705962>.
- Seymour RB, Ring D, Higgins T, Hsu JR. Leading the Way to Solutions to the Opioid Epidemic. *J Bone Joint Surg Am* 2017;99:e113. <https://doi.org/10.2106/JBJS.17.00066>.
- Smith DH, Kuntz J, DeBar L, Mesa J, Yang X, Boardman D, et al. A qualitative study to develop materials educating patients about opioid use before and after total hip or total knee arthroplasty. *J Opioid Manag* 2018;14:183-90. <https://doi.org/10.5055/jom.2018.0448>.
- Syed UAM, Aleem AW, Wowkanech CD, Weekes D, Freedman M, Pepe MD, et al. The Effect of Preoperative Education on Opioid Consumption in Patients Undergoing Arthroscopic Rotator Cuff Repair: A Prospective, Randomized Control Trial. *J Shoulder Elbow Surg* 2018;27:e123. <https://doi.org/10.1016/j.jse.2018.02.009>.
- Tedesco D, Gori D, Desai KR, Asch S, Carroll IR, Curtin C, et al. Drug-free interventions to reduce pain OR opioid consumption after total knee arthroplasty: a systematic review and meta-analysis. *JAMA Surg* 2017;152:e172872. <https://doi.org/10.1001/jamasurg.2017.2872>.
- Thiels CA, Ubl DS, Yost KJ, Dowdy S, Mabry T, Gazelka H, et al. Results of a Prospective, Multicenter Initiative Aimed at Developing Opioid-prescribing Guidelines After Surgery. *Ann Surg* 2018;268:457-68. <https://doi.org/10.1097/SLA.0000000000002919>.
- Volkow ND, McLellan TA, Cotto JH, Karithanom M, Weiss SRB. Characteristics of opioid prescriptions in 2009. *JAMA* 2011;305:1299-301. <https://doi.org/10.1001/jama.2011.401>.
- Vowles KE, McEntee ML, Julnes PS, Frohe T, Ney JP, Van Der Goes DN. Rates of opioid misuse, abuse, and addiction in chronic pain: A systematic review and data synthesis. *Pain* 2015;156:569-76. <https://doi.org/10.1097/01.j.pain.0000460357.01998.f1>.
- Yajnik M, Hill JN, Hunter OO, Howard SK, Kim TE, Harrison TK, et al. Patient education and engagement in postoperative pain management decreases opioid use following knee replacement surgery. *Patient Educ Couns* 2019;102:383-7. <https://doi.org/10.1016/j.pec.2018.09.001>.
- Yorkgitis BK, Brat GA. Postoperative opioid prescribing: Getting it RIGHT. *Am J Surg* 2018;215:707-11. <https://doi.org/10.1016/j.amjsurg.2018.02.001>.