



Director, Ophthalmic Anesthesia

Eye Center of Texas
Houston Eye Associates
Retina Consultants of Texas / America

President, Ophthalmic Anesthesia Society

Board Member & President, Texas Ambulatory Surgery
Center Society

FINANCIAL DISCLOSURE:

Medical Advisory Committee member and consultant for
Imprimis and Melt Pharmaceuticals – nothing received
for this meeting or any talks



Disclosures

Consultant: Imprimis and Melt Pharmaceuticals.



Persistent opioid use in Cataract surgery

Davidson, Richard S. MD; Donaldson, Kendall MD, MS; Jeffries, Maggie MD; Khandelwal, Sumitra MD; Raizman, Michael MD; Rodriguez Torres, Yasaira MD; Kim, Terry MD. Persistent opioid use in cataract surgery pain management and the role of nonopioid alternatives. *Journal of Cataract & Refractive Surgery*: June 2022 - Volume 48 - Issue 6 - p 730-740

doi: [10.1097/j.jcrs.0000000000000860](https://doi.org/10.1097/j.jcrs.0000000000000860)



Summary

- Opioids remain a mainstay intraoperatively for cataract surgery.
- 99% of patients who undergo ANY surgery receive an opioid analgesic at some point¹⁸
- The “Perfect Storm” for opioid use disorder (OUD)
 - Those most at risk are over the age of 50¹⁻³
 - Cataract surgery is the most common outpatient procedure performed worldwide.⁴⁻⁹
 - Average age for cataract extraction is 68²⁶
- Preventing any individual point of opioid exposure may reduce overall risk
- Understanding prescribing and abuse patterns may help us participate in fixing this problem.



Anesthesia for Cataract surgery

- Most cataract surgery is performed utilizing a combo of local / topical anesthetics along with monitored anesthesia care (MAC).¹⁰⁻¹⁷
- Common MAC medications include benzodiazepines (midazolam, diazepam, remimazolam), opioids (fentanyl, remifentanyl), propofol, ketamine, methohexital, dexmedetomidine
- Mayo Clinic review from 2020 found 79.5% of ophthalmic surgery patients received fentanyl¹⁹
- Widespread use of fentanyl in ophthalmic clinical trials as a comparator
- Duke review from 2020 looked at 3764 cataract cases and 96.9% received fentanyl²⁰
- There is a meaningful % of patients who experience significant postoperative pain ranging from 5-35%^{29,35,36}



Opioid crisis

- Pain became the 5th vital sign in the 90s with resultant 4-fold increase in opioid pain medication use and corresponding overdose / death / hospital admissions ^{21,22}
- Most people with OUD are first exposed through prescription medication. Simply having surgery is a risk factor for chronic opioid use. ^{23,28}
- 61% of opioids prescribed after surgery are not used resulting in surplus of meds for abuse. 50.5% of non-medical users obtained their opioids for free from a prescription intended for a friend or relative. ^{2,24,30,39}
- ***Opioid paradox***: more opioids used intraoperatively = greater requirement for opioids postoperatively¹⁸



Age related factors & Opioid use disorder

- “At risk” group is ages 50 – 80 & growing fastest in the 50–64 year age group¹⁻³
- Co-morbidities such as diabetes, heart failure & pulmonary disease had greater risk for prolonged opioid use. Elderly are also more sensitive to adverse effects.^{28,31}
- Elderly are more likely to have surgery: increased exposures = increased risk³²⁻³⁴
- Anxiety, decrease in independence or loss of a partner can lead to dependence³
- Accidental misuse due to forgetfulness, confusion or impaired judgement²
- Review from 2001-2013 found that cataract extraction had an OUD rate of 0.14% but with being the most common surgery worldwide, this means a large number of patients are at risk.²⁵



Long-term analgesic use after low-risk surgery^{27,33}

- 5% of patients were prescribed an opioid after cataract surgery
- Those who received a postoperative opioid prescription were 60% more likely to be using opioids long-term than those who didn't receive a prescription.
- Compared to other low-risk surgeries (lap chole, TURP and vein stripping), cataract surgery had the largest odds ratio for the risk of long-term opioid use.
- Cataract surgery patients were 1.62 times more likely to use opioids long-term compared with the other procedures that ranged from 1.33-1.41.
- As more surgical techniques have made the procedure less invasive and painful, patient perceived pain and opioid prescriptions continue to increase.

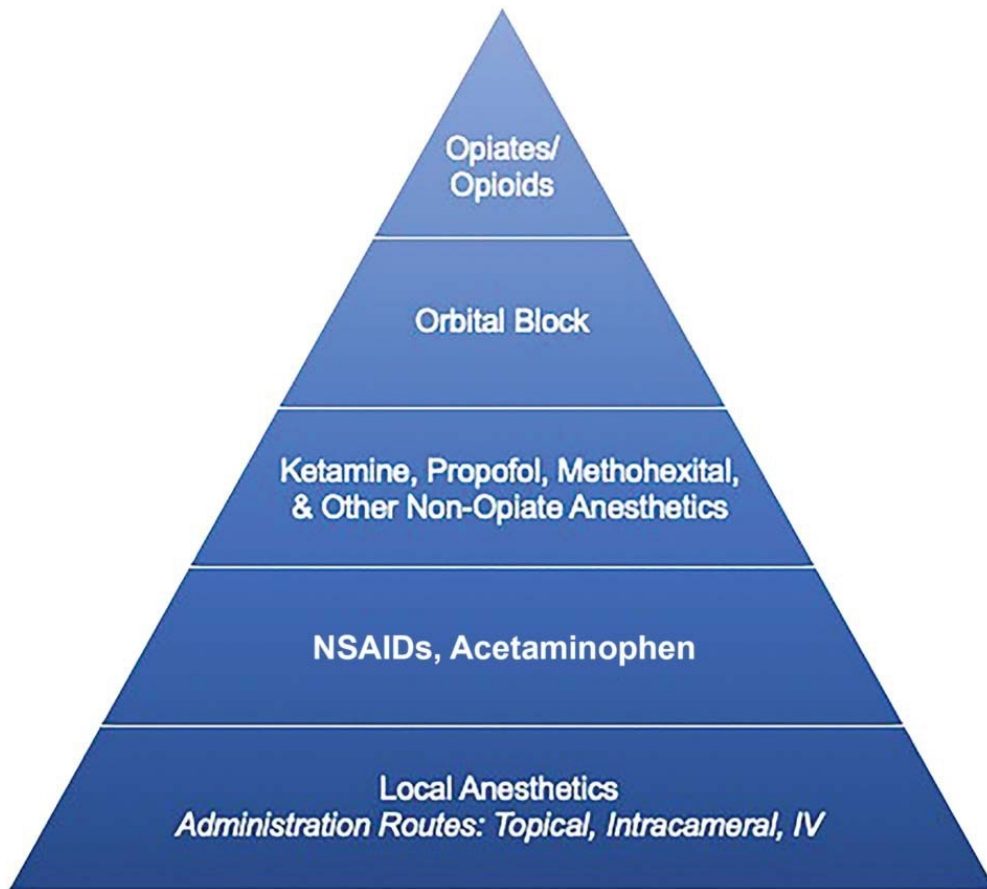


Prescribing habits and Ophthalmology

- 88-89% of ophthalmologists write <10 opioid prescriptions per year with the average writing 7 per year with a 5-day mean supply. ³²
- BUT even with a limited 5-day supply, 10% of patients can become chronic opioid users at one year. ^{32,38}
- Kolomeyer et al found that rates of filled opioid prescriptions increased for all types of ocular surgery over time. ³³
- Among eye surgeries, cataract surgery had the highest number of filled opioid prescriptions over a 17-year period. ³³



Pain management during cataract surgery



- Patient education
- Set realistic expectations
- Be creative and open minded
- Use intracameral lidocaine
- MKO melt allows you to go IV free while still providing sedation,
- Omidria was found to decrease pain and opioid use during & after cataract surgery



Omidria

Phenylephrine/ketorolac 1%/0.3%^{40-45,34}

- Mydriatic and NSAID combined which, when added to the irrigating solution for continuous intracameral administration during cataract surgery, minimizes intra- and postoperative opioid exposure and decreases postoperative pain
- 50% decrease in mean VAS scores with Omidria vs placebo or control group
- Use of oral analgesics on the day of surgery significantly lower
- Allowed for a 13% reduction in surgical time
- Ketorolac has been demonstrated in therapeutic concentrations in the aqueous and vitreous up to 10 hrs post-op in canines compared to topical dosing with similar results in humans.



The problem with preoperative opioid use

- Overall rates of intraoperative and postoperative complications were higher in opioid users than non-users
- This included visually significant and vision-threatening complications
- Opioid users 5 times more likely to experience intraoperative complications
- 3 times more likely to experience postoperative complications⁴⁷



Why do we prescribe opioids after cataract surgery?³³

- Deficient physician education
- Greater focus on pain as a 5th vital sign
- Lack of state/national standardization of prescribing regulations
- Increased awareness by physicians about patient pain/pain perception and correlation with satisfaction scores
- Drug company marketing strategies



What can we do?

- Understand that there is a disconnect between pain management and patient pain experience in cataract surgery despite increasingly refined surgical techniques
- Take the time to assess, change and improve standard of care practices
- Be mindful of cataract surgery patients already on an opioid regimen for another condition and take mitigating steps to decrease the potential for complications
- Reevaluate your standard protocols for pain management and analgesia surrounding cataract surgery and collaborate with colleagues in Anesthesia.
- Balance patients' pain control needs with judicious use of opioids while better utilizing newer and safer non-opioid alternatives such as MKO melt and Omidria



I leave you with this.....

“Reducing exposure to opioids even after small surgeries may have even greater benefits in that it could reduce the cumulative risk resulting from multiple opioid exposures. Those in the elderly patient population may undergo multiple temporally related procedures, almost all of which entail opioid administration both during surgery and postoperatively.”

David J Clark, MD PhD, Veterans Affairs Palo Alto and Stanford University Department of Anesthesiology³⁷



References

1. Zhao S, Chen F, Feng A, Han W, Zhao Y. Risk factors and prevention strategies for postoperative opioid abuse. *Pain Res Manag* 2019;2019: 7490801
2. Chang Y, Compton P. Opioid misuse/abuse and quality persistent pain management in older adults. *J Geron Nurs* 2016;42:21–29
3. Tilly J, Skowronski S, Ruiz S. The Opioid Public Health Emergency and Older Adults. Department of Health and Human Services. Administration for Community Living Issue Brief; 2017. Available at: https://the-consumervoice.org/uploads/files/general/ACL_Issue_Brief_-_Opioid_Abuse_and_Older_Adults_-_Dec2017.pdf. Accessed December 20, 2020
4. Schrader WE. Traditional cataract treatment and the healers perspective: dialogue with western science and technology in Nigeria, West Africa. *Ann Afr Med* 2004;3:153–158
5. Davis G. The evolution of cataract surgery. *Mo Med* 2016;113:58–62
6. Rho J, Houser K, Patel AS. History of Cataract Surgery. American Academy of Ophthalmology; 2020. Available at: https://eyewiki.aao.org/History_of_-
7. Cataract_Surgery. Accessed November 18, 2020 . Cataract Surgery: Couching to Phaco. An Exhibit Celebrating the 50th Anniversary of Phacoemulsification and all the Achievements in Cataract Surgery Leading to it. American Academy of Ophthalmology; 2017.
8. KiatosE. A Systematic Review and Meta-analysis of Intravenous Sedation in Modern Cataract Surgery [dissertation]. University of Western Ontario; 2017
9. Moore DB, Harris A, Siesky B. The world through a lens: the vision of Sir Harold Ridley. *Br J Ophthalmol* 2010;94:1277–1280
10. Greenbaum S. Anesthesia for eye surgery. In: *Ocular Anesthesia*. WB Saunders Co. Ltd: 1997. Available at: <http://www.oculist.net/download502/prof/ebook/duanes/pages/v6/v6c001.html>. Accessed December 2, 2020
11. History of Anesthesia. Wood Library-Museum of anesthesiology. Available at: <https://www.woodlibrarymuseum.org/history-of-anesthesia/>. Accessed December 2, 2020



12. Preoperative considerations for cataract surgery. In: Tsai LM, Afshari NA, Brasington CR, Cole C, Currie BD, Edgington BD, Horn EP, eds. 2020-2021 Basic and Clinical Science Course (BCSC) Section 11 - Lens and Cataract; 2020. Available at: <https://www.aao.org/bcscsnippetdetail.aspx?id=c6b-ba5fc-cfa7-4c0f-a879-b184f4cf7f4d>. Accessed December 2, 2020
13. Reddy SC, Thevi T. Local anaesthesia in cataract surgery. *Int J Ophthalmol* 2017;3:201–210
14. Sanders RD, Cutler NL. General anesthesia in cataract surgery. *Arch Ophthalmol* 1950;43:653–660
15. Vann MA, Ogunnaike BO, Joshi GP. Sedation and anesthesia care for ophthalmologic surgery during local/regional anesthesia. *Anesthesiology* 2007;107:502–508
16. Knapp H. On cocaine and its use in ophthalmic and general surgery. *Arch Ophthalmol* 1884;13:402–448
17. Atkinson WS. Retrobulbar injection of anesthetic within the muscular cone. *Arch Ophthalmol* 1936;16:494–503
18. Koepke EJ, Manning EL, Miller TE, Ganesh A, Williams DGA, Manning MW. The rising tide of opioid use and abuse: the role of the anesthesiologist. *Perioper Med (Lond)* 2018;7:16
19. Russell KM, Warner ME, Erie JC, Kruthiventi SC, Sprung J, Weingarten TN. Anesthesia recovery after ophthalmologic surgery at an ambulatory surgical center. *J Cataract Refract Surg* 2019;45:823–829
20. Shetabi H, Hashemi SJ, Haghi F, Moradi Farsani D. Safety and efficacy of fentanyl vs pethidine in cataract surgery under propofol- based sedation: a double-blind randomized controlled clinical trial. *J Res Med Sci* 2020;25:81
21. American Pain Society Quality of Care Committee. Quality improvement guidelines for the treatment of acute pain and cancer pain. *JAMA* 1995;274:1874–1880
22. Paulozzi LJ, Jones C, Mack K, Rudd R. Vital signs: overdoses of prescription opioid pain relievers. *CDC Morb Mortal Wkly Rep* 2011;60:1487–1492
23. Centers for Disease Control and Prevention. Prescription opioid overdose data. Available at: <https://www.cdc.gov/drugoverdose/data/overdose.html>. Accessed December 7, 2020
24. Schirle L, Stone AL, Morris MC, Osmundson SS, Walker PD, Dietrich MS, Bruehl S. Leftover opioids following adult surgical procedures: a systematic review and meta-analysis. *Syst Rev* 2020;9:139
25. Sun EC, Darnall BD, Baker LC, Mackey S. Incidence of and risk factors for chronic opioid use among opioid-naive patients in the postoperative period. *JAMA Intern Med* 2016;176:1286–1293



26. Kauh CY, Blachley TS, Lichter PR, Lee PP, Stein JD. Geographic variation in the rate and timing of cataract surgery among US communities. *JAMA Ophthalmol* 2016;134:267–276
27. Alam A, Gomes T, Zheng H, Mamdani MM, Juurlink DN, Bell CM. Long-term analgesic use after low-risk surgery: a retrospective cohort study. *Arch Intern Med* 2012;172:425–430
28. Clarke H, Soneji N, Ko DR, Yun L, Wijeyesundera DN. Rates and risk factors for prolonged opioid use after population based cohort study. *BMJ* 2014;348:g1251
29. Coppens M, Versichelen L, Mortier E. Treatment of postoperative pain after ophthalmic surgery. *Bull Soc Belge Ophtalmol* 2002;285:27–32
30. Charlson ES, Feng PW, Bui A, Grob S, Tao JP. Opioid prescribing patterns among American society of ophthalmic plastic and reconstructive surgery members in the Medicare part D database. *Ophthalmic Plast Reconstr Surg* 2019;35:360–364 68.
31. Scott JC, Stanski DR. Decreased fentanyl and alfentanil dose requirements with age. A simultaneous pharmacokinetic and pharmacodynamic evaluation. *J Pharmacol Exp Ther* 1987;240:159–166
32. Patel S, Sternberg P Jr. Association between opioid prescribing patterns and abuse in ophthalmology. *JAMA Ophthalmol* 2017;135:1216–1220
33. Kolomeyer AM, Yu Y, VanderBeek BL. Association of Opioids With Incisional Ocular Surgery. *JAMA Ophthalmol*. 2019 Nov;137(11):1283-1291.
34. Donnenfeld ED, Shojaei RD. Effect of intracameral phenylephrine and ketorolac 1.0%/0.3% on intraoperative pain and opioid use during cataract surgery. *Clin Ophthalmol*. 2019;13:2143–2150.
35. Porela-Tiihonen S, Kaarniranta K, Kokki, H. Postoperative pain after cataract surgery, *J Cataract Refract Surg*. 2013;39(5):789-798.
36. Porela-Tiihonen S, Kaarniranta K, Kokki, M, Purhonen S, Koki H. A prospective study on postoperative pain after cataract surgery. *Clin Ophthalmol*. 2013;7:1429-1435. doi: 10.2147/OPHTH.S47576.
37. Department of Health and Human Services, Centers for Medicare & Medicaid Services. *Medicare Program: Changes to Hospital Outpatient Prospective Payment and Ambulatory Surgical Center Payment Systems and Quality Reporting Programs. Evaluation and CY 2020 Proposal for Payment for Non-Opioid Alternatives. Fed Regist*. 2019;84(218):61176-61197, 61402. Accessed March 18, 2021. <https://www.govinfo.gov/content/pkg/FR-2020-12-29/pdf/2020-26819.pdf>



38. Shah A, Hayes CJ, Martin BC. Characteristics of Initial Prescription Episodes and Likelihood of Long-Term Opioid Use — United States, 2006–2015. *MMWR Morb Mortal Wkly Rep.* 2017;66:265–269. doi:[10.15585/mmwr.mm6610a1](https://doi.org/10.15585/mmwr.mm6610a1)
39. Center for Behavioral Health Statistics and Quality. *Behavioral health trends in the United States: Results from the 2014 National Survey on Drug Use and Health.* 2015. Accessed December 11, 2020. <http://www.samhsa.gov/data/sites/default/files/NSDUH-FRR1-2014/NSDUH-FRR1-2014.pdf>.
40. Omidria. Prescribing information. Omeros Corporation; December 2017.
41. Hovanesian JA, Sheppard JD, Trattler WB, Gayton JL, Malhotra RP, Schaaf DT, Ng E, Dunn SH. Intracameral phenylephrine and ketorolac during cataract surgery to maintain intraoperative mydriasis and reduce postoperative ocular pain: Integrated results from 2 phase 3 studies. *J Cataract Refract Surg.* 2015;41:2060-2068.
42. Reddy R, Kim SJ. Critical appraisal of ophthalmic ketorolac in treatment of pain and inflammation following cataract surgery. *Clin Ophthalmol.* 2011;5:751-758.
43. Waterbury LD. Alternative drug delivery for patients undergoing cataract surgery as demonstrated in a canine model. *J Ocul Pharmacol Ther.* 2018 Jan/Feb;34(1-2):154-160. doi:10.1089/jop.2017.0048.
44. Katsev DA, Katsev CC, Pinnow J, Lockhart CM. Intracameral ketorolac concentrations at the beginning and end of cataract surgery following preoperative topical ketorolac administration. *Clin Ophthalmol.* 2017;11:1897-1901.
45. Schoenberger SD, Kim SJ, Sheng J, Calcutt MW. Reduction of vitreous prostaglandin E2 levels after topical administration of ketorolac 0.45%. *JAMA Ophthalmol.* 2014 Feb;132(2):150-4.
46. Jackson K, Wisely CE, Davis BM, Griffin B, Kim T. Real-world opioid prescribing after cataract surgery among patients who received intracameral phenylephrine and ketorolac 1.0%/0.3%. *Curr Med Res Opin.* 2020. doi:10.1080/03007995.2020.1834373
47. Rodriguez Torres Y, Skender S, McDermott M. Association between cataract use and prescription opioid use. Poster presented at: Cataract Surgery: Telling it Like it Is, February 12–16, 2020