

Statement of Purpose

To determine the effect of an opioid prescribing protocol for patients undergoing elective foot and ankle surgeries at Hennepin Healthcare.

Methodology

- This retrospective study was approved by the Institutional Review Board. The prescribing of opioid pain medication was studied for patients undergoing elective foot and ankle surgery for a one-year time period after implementation of a specific prescribing protocol 1/1/2017-12/31/2017, and compared to a control group of patients undergoing the same types of procedures from 1/1/2014-12/31/2014.
- Exclusion criteria included certain procedures (non-elective incision and drainage, amputation, trauma) and patients with chronic pain, which was defined as patients receiving opioid prescriptions greater than two weeks prior to surgery.
- The protocol included written patient communications including instructions prior to any elective procedure as well as instructions for every postoperative visit. (See Figure 1).
- The protocol provided uniform parameters for prescribing types and amounts of pain medication based on procedures performed.



You have been scheduled to have surgery on your foot or ankle at HCMC. You should expect to have some amount of post-operative pain after the anesthetic wears off from your surgical procedure. The first 2-3 days after your surgery are usually the most uncomfortable. Our surgeons at HCMC hope to provide you this information so that you can be prepared and have the best possible outcome.

It is important to take your pain medication and Vistaril as prescribed. The types of medication that your surgeon prescribes will be based on your procedure. Your Foot & Ankle Surgeon will manage your pain after surgery for about 30 days.

Other ways to reduce pain are to elevate your foot above your heart, stay off your foot as much as possible, and you can also put an icepack on the top of your ankle or behind your knee to help relieve pain.

Most patients receive one narcotic pain prescription upon discharge from your surgery. You will then only receive one more prescription for your post-operative pain. Beyond this prescription you will be limited to non-narcotic pain medications and anti-inflammatories. This is hospital protocol. Your surgeon may also prescribe non-narcotic medications to help reduce your pain such as hydroxyzine or ibuprofen.

It is important to take your pain medication as prescribed because serious injury or death can occur if too much is taken. Do not drive, drink alcohol, or go to work while on narcotics. There has been a sharp increase in opioid related deaths nationwide recently, which is why our department has limited the amount of narcotic pain medication prescribed post-operatively. If you lose your pain pills or prescription, a new one will not be prescribed. This is non-negotiable. You will be limited to Tylenol or other non-narcotic pain medication.

Figure 1.Pre Operative instructions

Methodology continued

Prescribing protocol following elective surgeries at Hennepin health

| | NSAIDS | Narcotics |
|--|--|--|
| Foot surgery and RRA soft tissue type procedures (e.g. excision ganglion cyst, excision Neuroma) | Ibuprofen 600-800mg: 1 tablet tid or similar NSAID for 14 days #60 tablets | Hydrocodone 5mg/ Acetaminophen 325mg: 1 tablet q6h prn pain # 30 tablets No additional refills |
| Foot Surgery Osseous procedures (e.g. any metatarsal osteotomy, 1 st MPJ fusion) | Ibuprofen 600-800mg: 1 tablet tid or similar NSAID for up to 30 days #90 tablets | Hydrocodone 5mg/ Acetaminophen 325mg: 1 tablet q6h prn pain # 30 tablets or 10 day supply with 1 additional prescriptions if needed |
| RRA Surgery Osseous Procedure (e.g. flatfoot reconstruction, lateral ankle stabilization, Cava reconstruction) | | Hydrocodone 5 mg/ Acetaminophen 325mg: 1-2 tablets q6h prn pain #30 tablets with 2 additional prescriptions if needed |
| All patients also received a prescription for Hydroxyzine 25mg: 1 tablet Q6h to potentiate effects of narcotic #45 tablets with 2 additional prescriptions if needed | | |

Table 1. Summarization of prescribing protocol

The protocol divided patients into three different categories:

- Soft Tissue - Foot & Rearfoot
- Foot Surgery Osseous
- Reconstructive Rearfoot and Ankle (RRA) Osseous

Patients were to receive a set number pills and a set number of prescriptions based on the category (See Table 1)

Multimodal pain relief included use of non-steroidal anti-inflammatories, gabapentinoids, and hydroxyzine for added pain relief based on the categories above (See Table 1).

Any additional requests for pain medications after 30 days (or 90 days for RRA Osseous procedures), were referred to the primary care provider and/or a pain clinic referral.

Results

The primary procedure type is summarized in Table 2. The most common surgeries included soft tissue mass removal and hallux valgus procedures.

During 2014 96 procedures were performed: 17 soft tissue, 73 Foot Osseous and 6 RRA osseous procedures. During 2017 102 procedures were performed: 23 Soft Tissue, 70 Foot Osseous and 9 RRA Osseous procedures. The number of pills prescribed per patient during the 90 day post operative course were then recorded and converted to morphine milligram equivalents (MME) for direct comparison.

Overall the patient's 90 day total mean MME in 2014 prior to opioid protocol for Soft Tissue, Foot Osseous and RRA Osseous were 442, 546, and 683. After the initiation of our opioid protocol MME values were 215, 325 and 588 for Soft Tissue, Foot Osseous and RRA osseous procedures respectively.

Results Continued

Table 2. Types of procedures performed

| Primary procedure performed Soft tissue Soft tissue mass removal (ganglion cyst, mucoïd cyst) plantar plate repair Neuroma Excision Plantar fasciotomy Total Forefoot Hallux valgus procedures (Austin, Lapidus) Hallux rigidus procedure (decompression osteotomy, cheilectomy, fusion) Hammertoe (fusion, arthroplasty, <u>weil</u> osteotomy) Other bony procedures (midfoot fusion, <u>corticotomy</u>) Total Rearfoot flatfoot reconstruction Ankle Arthroscopy Retrocalcaneal <u>exostectomy</u> with repair of Achilles tendon Rearfoot fusion (talonavicular, subtalar) Total | Number of patients | |
|--|--------------------|------|
| | 2014 | 2017 |
| | 15 | 15 |
| | 0 | 1 |
| | 0 | 3 |
| | 2 | 4 |
| | 17 | 23 |
| | | |
| | 52 | 39 |
| | 4 | 13 |
| | | |
| | 14 | 16 |
| | 3 | 2 |
| | 73 | 70 |
| | | |
| | 3 | 3 |
| | 2 | 4 |
| | 1 | 0 |
| | 0 | 2 |
| | 6 | 9 |

Table 2. Types of procedures performed during 2014 and 2017

After initiation of the prescribing protocol, there was a significant decrease in overall narcotic prescribed following elective foot and ankle surgery for all three categories of surgery:

- Soft Tissue Surgery = 51% decrease
- Foot Osseous = 40% decrease
- RRA Osseous = 17% decrease

| ANALYSIS OF NARCOTIC USE 90 DAYS AFTER FOOT AND ANKLE SURGERY PRIOR TO NARCOTIC PROTOCOL (2014) AND AFTER NARCOTIC PROTOCOL (2017) | | | | | |
|--|----------------------|----------------------|--|--|-----------------------|
| PROCEDURES | No. of patients 2014 | No. of patients 2017 | Average MME (mg) post operatively 2014 | Average MME (mg) post operatively 2017 | Percentage difference |
| SOFT TISSUE | 17 | 23 | 442 | 215 | 51% decrease |
| FOREFOOT | 73 | 70 | 546 | 325 | 40% decrease |
| REARFOOT | 6 | 9 | 683 | 588 | 13% decrease |

Table 3. Summarization of total procedures performed and average MME post operatively

Literature Review

Over the past two decades, the number of opioid prescriptions in the United states has nearly tripled from 76 million in 1991 to 207 million in 2013. This increase may be an unintended consequence of a federal mandate to include rating pain as the “fifth vital sign” and the push for proper post operative pain control in the 1990s. However this increase in prescribed opioids has also lead to a crisis in opioid-related deaths. In 2016 there were more than 63,000 drug related deaths. Of these 66% were related to opioids.

Literature Review Continued

- Currently the United states consumes about 80 percent of the global opioid supply and 99 percent of the hydrocodone supply. Orthopedic surgeons prescribe 8% of the total opioid prescriptions in the United States.
- Saini et al look at the total opioid consumption patterns following outpatient orthopedic foot and ankle surgeries. In their study they found that on average patients were prescribed 40 narcotic pills, while consuming only 20 pills on average, or a 50% utilization rate. They also reported that bony procedures, procedures requiring regional anesthesia, age < 60, and pre operative VAS scores resulted in more opioid needs. Gupta et al also reported that patients on average required 22.5 pills on average post operatively after outpatient foot and ankle surgery.
- Elizabeth et al studied total number of opioids required after foot and ankle surgery. Patients were randomized into two groups, one receiving post operative ketorolac and the other not. They reported that although adding ketorolac did not decrease the number of narcotic pills consumed, it did significantly decrease patients pain post operatively though post op day 2.

Analysis and Discussion:

Opioids are essential for effective analgesia after most orthopedic procedures. Along with opioids, additional supplementary techniques are frequently used to help decrease the use of post operative opioids, including NSAID's, hydroxyzine, and gabapentanoids to name a few. Physicians face multiple challenges - balancing the need to provide adequate pain relief and prevention of abuse or addiction - following surgery.

The advantages of a prescribing protocol include providing a framework for uniform prescribing expectations and tools for communication - for providers, nursing staff, and patients alike - during the perioperative period. The greatest advantage of initiating a protocol is the significant reduction of opioids prescribed, as discovered in this study.

This protocol is intended to help reduce the total opioids prescribed post operatively and therefore limit the availability in the community. Despite the advances toward understanding the dangers or opioids, rates of addiction, overdoses and death continue to rise. Additional research into patient quality of care and safety following elective foot and ankle surgery is needed.

References

- [The Opioid Epidemic in 2017: Are We Making Progress?](#) Woodard D, Van Demark RE Jr. S D Med. 2017 Oct;70(10):467-471.
- Baker DW. The Joint Commision's Pain Standards: Origins and Evolution. Oakbrook Terarace, IL: The joint Commision; 2017
- Opioid Overdose.” *Centers for Disease Control and Prevention*, Centers for Disease Control and Prevention, 30 Aug. 2017, www.cdc.gov/drugoverdose/epidemic/index.html.
- Morone NE, Weiner DK. PAIN AS THE 5TH VITAL SIGN: EXPOSING THE VITAL NEED FOR PAIN EDUCATION. *Clinical therapeutics*. 2013;35(11):1728-1732. doi:10.1016/j.clinthera.2013.10.001.
- An Evidence-Based Approach to the Prescription Opioid Epidemic in Orthopedic Surgery Soffin, Ellen M., MD, PhD; Waldman, Seth A., MD; Stack, Roberta J., MS; Liguori, Gregory A., MD Anesthesia & Analgesia: [November 2017 - Volume 125 - Issue 5 - p 1704-1713](#)
- McDonald, E., Daniel, J., Nicholson, K., Shakked, R., Raikin, S., Pedowitz, D., & Winters, B. (2018). A Prospective Randomized Study Evaluating the Effect of Perioperative NSAIDs on Opioid Consumption and Pain Management After Ankle Fracture Surgery. *Foot & Ankle Orthopaedics*. <https://doi.org/10.1177/2473011418S00085>
- Rudd RA, Seth P, David F, Scholl L. Increases in Drug and Opioid-Involved Overdose Deaths – United States, 2010-2015. *MMWR Morb Mortal Wkly Rep* 2016;65:1445-1452. DOI: <http://dx.doi.org/10.15585/mmwr.mm6505051e1>
- Jones MR, Viswanath O, Peck J, Kaye AD, Gill JS, Simopoulos TT. A Brief History of the Opioid Epidemic and Strategies for Pain Medicine. *Pain Ther*. 2018;7(1):13-21.
- Saini, S., McDonald, E. L., Shakked, R., Nicholson, K., Rogero, R., Chapter, M., ... Daniel, J. N. (2018). Prospective Evaluation of Utilization Patterns and Prescribing Guidelines of Opioid Consumption Following Orthopedic Foot and Ankle Surgery. *Foot & Ankle International*. <https://doi.org/10.1177/1071100718790243>
- McDonald, E., Daniel, J., Nicholson, K., Shakked, R., Raikin, S., Pedowitz, D., & Winters, B. (2018). A Prospective Randomized Study Evaluating the Effect of Perioperative NSAIDs on Opioid Consumption and Pain Management After Ankle Fracture Surgery. *Foot & Ankle Orthopaedics*. <https://doi.org/10.1177/2473011418S00085>

Financial Discolosures

None

Contact Information

Matthew Tschudy, DPM
Matthew.Tschudy@hcmed.org