

# Less is More: Limiting Narcotic Prescription Quantities for Common Orthopedic Procedures

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Daniel Fulham O'Neill, MD,  
EdD<sup>1</sup>Christopher Webb Thomas,  
MS, ATC, OTC<sup>1</sup><sup>1</sup>The Alpine Clinic, PLLC, a division  
of Littleton Regional Healthcare,  
Plymouth, NH

## Abstract

**Background:** Clinicians are now appreciating that the perception of pain is a multifaceted, biopsychosocial construct. Expectation of postsurgical pain is part of this construct and should be considered preoperatively. It is our belief that by establishing reasonable expectations with preoperative teaching, we can minimize narcotic use and lessen untoward issues that can potentially follow. With this goal in mind, we have been using a comprehensive pre- and postoperative program for our outpatient orthopedic surgery patients for the last 5 years, which includes physical, pharmacologic, and simple sport psychological techniques. **Materials and Methods:** We reviewed postoperative prescription narcotic purchases in 133 consecutive surgical patients during the last year (2013). All patients were given a prescription postoperatively for 10 hydrocodone 5-mg/acetaminophen 500-mg tablets, with 1 refill. We then contacted the patients' pharmacies to assess the actual amount purchased. **Results:** Data were available for 100 patients. Of these, 62 patients had undergone "simple" arthroscopies and 38 had had "open" procedures, including 25 anterior cruciate ligament reconstructions, 4 tibial tubercle osteotomies, and various other surgeries. Of the 62 arthroscopies, 24 patients (39%) refilled their prescriptions, with 4 patients (6%) needing > 1 refill. Of the 38 open procedures, 16 patients (42%) refilled their medications, 2 (5%), more than once. Thus, 89% of patients required ≤ 20 narcotic tablets after undergoing common orthopedic operations. No patient needed chronic narcotic medication. **Discussion:** Pain is a complex issue and patient expectation of postoperative pain is one aspect that can potentially affect the amount of narcotics used. By preparing the patient both physically and psychologically, we believe the amount of narcotics used postoperatively can be decreased without affecting pain control. As a result, the multiple possible detriments of having more narcotics available than actually necessary would be lessened. By limiting the overall number of narcotic tablets prescribed, decreased use by the patient when such a medication may no longer be appropriate, and minimized use by others in the household who might have access to it would decrease.

**Keywords:** pain management; orthopedics; narcotics; surgery

## Introduction

To discuss a subject as wide-ranging, controversial, subjective, and indeed, confusing as pain management, is a daunting task.<sup>1</sup> Perhaps, our best hope is to attempt to break the subject down into smaller pieces and ultimately, some overarching policy suggestions might be agreed upon.

No one would deny there is a crisis in the use and abuse of prescription pain medicine, especially oral narcotics, in the United States.<sup>2-5</sup> In our study, we present data on and an approach to the topic of managing patient postoperative pain for common

Correspondence: Daniel Fulham O'Neill,  
MD, EdD,  
The Alpine Clinic,  
12 Yeaton Road, Suite C4, Box #12,  
Plymouth, NH 03264.  
Tel: 603-536-2270  
Fax: 603-536-2277  
E-mail: doneill@lrhcares.org

orthopedic procedures. Specifically, we review the concept of expectation or anticipation of pain in these patients.

As most clinicians know from experience, people deal with pain, or, more specifically, the perception of pain, in myriad ways.<sup>6-8</sup> The strategy employed by patients to cope with pain was one of the many "mind/body" connections that compelled one of the authors (DF O'Neill), after 10 years as an orthopedic surgeon, to return to school for a degree in sport psychology. Using the sport psychology context allowed us to create a more comprehensive approach to pain management for patients at our facility pre- and postsurgery.<sup>9</sup> By preparing the patient from both physical and psychological perspectives, we hoped to inform reasonable expectations to increase patient compliance, decrease morbidity, decrease surgical stress, and, of course, improve results. There have been studies concerning patient expectations of results of surgery and long-term pain relief,<sup>10-12</sup> however, few have looked at patient expectations in the short term and how patients might best prepare for the stress of surgery.

The purpose of our study was to assess the quantity of narcotic tablets purchased after common outpatient orthopedic procedures to establish a baseline for other physicians. To our knowledge, such data have never been published. From discussing the subject with many colleagues, we found our clinic narcotic protocol calls for prescribing fewer tablets than others polled. It is our belief that by emphasizing multiple modalities of rehabilitation and pain control, we can minimize narcotic use in both the pre- and postoperative periods, thus limiting the amount of "left-over" narcotics in society.

## Materials and Methods

We performed a single-center, retrospective study after obtaining authorization from our Institutional Review Board. We reviewed 133 consecutive orthopedic surgery cases. All

of the patients reviewed in our study signed a consent form authorizing us to obtain their prescription history and each provided a primary pharmacy. Study patients aged < 18 years were required to have a parent or guardian present to sign consent forms. All patients were operated on by the senior author (DF O'Neill). Patient surgeries were classified as "simple" knee arthroscopies (n = 62), needing only arthroscopic portal incisions, or "open" procedures (n = 38), which required larger incisions (Table 1). Study patient ages ranged from 13 to 71 years, with a mean age of 42 years. The study population included 59 women and 41 men. In order to evaluate 100 patients for ease of statistical evaluation, we needed to include 133 patient cases. Due to the nature of our practice, 33 patients resided out of town, used other pain medications, or had not filled their prescription. These 33 patients were excluded from our study. All surgeries were performed in a hospital operating setting and patients were discharged the same day. More than 85% of the procedures were performed using general anesthesia, after the anesthesia staff (a combination of anesthesiologists and nurse anesthetists) were given the choice of utilizing spinal or general anesthesia.

All study patients were educated preoperatively with a series of educational handouts specific to our clinic, or, in the case of most "open" procedures, from a book specifically addressing knee surgery and rehabilitation.<sup>9</sup> The education component, including discussion of icing, bracing, crutch walking, massage, elevation, and a program of non-narcotic medications for pain management, was initiated on the first office visit and emphasized at each succeeding encounter (Table 2 and 3). Instruction was given by whichever caregiver was available: the physician, nurse practitioner, or athletic trainer. Front-office personnel were also aware of the protocols and could easily field follow-up questions when

Table 1. Postoperative Narcotic Use

Procedure	Number of Patients	No Refills	1 Refill	> 1 Refill
"SIMPLE" Knee Arthroscopy	62	38	20	4
"OPEN" Procedures	38	22	14	2
ACL Reconstruction*	25	13	12	0
Tibial Tubercle Osteotomy	4	2	1	1
Proximal Patella Realignment	1	0	0	1
Ankle ORIF	1	1	0	0
Patella Tendon Debridement	2	2	0	0
Removal of Hardware	2	2	0	0
Ganglion Cyst Removal	1	1	0	0
Knee scope and Trigger Thumb Release	1	0	1	0
MCL Reconstruction	1	1	0	0

\*Specific surgical procedure and number of refills for original postoperative prescription of 10 hydrocodone 5-mg/acetaminophen 500-mg tablets. Abbreviations: ACL, anterior cruciate ligament; MCL, medial collateral ligament; ORIF, open reduction and internal fixation.

presented. No patients were prescribed narcotics postinjury by our office.

At the preoperative visit, in addition to continuing the written program, patients were given a prescription for 10 tablets of hydrocodone 5 mg/acetaminophen 500 mg and 1 refill. (Note that we have since switched to prescribing a new formulation containing less acetaminophen.) No patients in the limited study group had a known intolerance to either hydrocodone or acetaminophen. Patients were instructed to only take the narcotic as needed, and to stop taking the agent as soon as possible, preferably on postoperative day 1. They were also instructed that as they stopped use of the narcotic, to continue taking an anti-inflammatory drug, if needed, and, once hydrocodone/acetaminophen use had ended, acetaminophen, 1000 mg, could be taken with each meal (Table 3), again, as needed. Patients were instructed at each visit that the less medicine they used, the sooner their gastrointestinal system and sensorium would return to baseline.

Data was collected  $\geq 1$  year later by contacting each patient's pharmacy as determined from the office chart. After being contacted by 1 of the authors (CW Thomas), who explained the purposes of the study, the pharmacies would access their database to determine whether a script had been filled at all and also, if indicated, the number of refills. Not all patients filled their prescriptions and pharmacy data was not available for others, therefore, we needed consider 133 procedures to gather data for 100 patients. As our study was performed well after the surgical procedures were completed, we were able to verify that none of our patient prescriptions were filled  $> 3$  weeks postoperatively. Although we did not try to ascertain the exact number of tablets used per patient,

these methods allowed us to at least know the maximum number of narcotic tablets potentially used, thus not having to rely on patient recall or pill counts.

## Results

Data were available for 100 patients. Of these, 62 patients underwent simple arthroscopies and 38 had open surgeries, including 25 anterior cruciate ligament (ACL) reconstructions, 4 tibial tubercle osteotomies, and multiple other surgeries (Table 1). Of the 62 arthroscopies, 24 patients (39%) refilled their prescriptions, with 4 patients (6%) needing  $> 1$  refill. Of the 38 open procedures, 16 patients (42%) refilled their medication, 2 (5%) more than once. Thus, 89% of patients used  $\leq 20$  hydrocodone 5-mg/acetaminophen 500-mg tablets postoperatively.

Though there is chance patients could have received more narcotics from another physician, it is the nature of our practice and community that such an event would be exceedingly rare. No patient was ever denied a refill when requested. No patients in our study group went on to need narcotics beyond week 3 postoperatively.

## Discussion

Patient expectations of pain, pain relief, and physical function after treatment can play a vital role in the eventual success of surgical procedures<sup>13-15</sup>; many studies, however, have looked at certain patient groups or types of procedures to predict results.<sup>16-18</sup> It has been our theory that preparing the patient's expectations—both physically and psychologically—for a stress such as surgery would decrease issues, increase compliance, and eventually lead to a better result.

**Table 2.** Instructional Material for Patients Provided at First Office Visit

Rest/Crutch Walking	Institute a "return-to" program for vocational and avocational activities (in other words, we need to define "rest") Crutch Walking: patients given very specific written and hands-on instructions, as this is a vital part of "rest" for lower extremity injuries
Ice/Contrast Baths	Ice for 20 minutes at a time, with some thin material between the ice bag and skin. Surgical site stays elevated while icing Contrast baths may also be useful: 5 minutes of ice, followed by 5 minutes of moist heat, followed by 5 minutes of ice
Compression	Should be used throughout the day and removed when sleeping. A long stocking, such as TEDS, recommended. If using ace bandage, start from the toes and wrap up the leg
Elevation	Elevating the extremity means getting it above the heart!
Massage	Massage toward the heart. This is key for swelling and desensitization
Range of Motion	ROM stretches might be uncomfortable: that's okay and is different than "pain"
Level A Workout	Simple strengthening exercises including quad sets, hamstring sets, co-contractions, etc, to keep the muscles awake early on
Soft Workouts	Swimming is the ultimate soft workout, followed by cycling. These can be key for rehabilitation and positive psychological status

Abbreviations: ROM, range of motion; TEDS, thrombo-embolic deterrent stockings.

**Table 3.** OTC Medication Alternatives to Narcotics

2 naproxen (220-mg tablet)*	With food – BID
3–4 ibuprofen (200-mg tablet)*	With food – TID

OR

For more significant pain, the patient can add 1000 mg of acetaminophen, taken with each meal, to NSAID medications

\*Patient Medication Schedule: OTC quantities shown equal to dosages of prescription medication. We have found over many years this is a safe regimen for short-term use by adults assuming normal liver and kidney function.

Abbreviations: BID, twice daily; NSAID, nonsteroidal anti-inflammatory drug; OTC, over the counter; TID, three times daily.

After 30 years of observational and anecdotal evidence, the perception in our clinic is that athletes, business owners, and other patients with clear goals do better in the days postoperatively, use fewer narcotics, and have better short-term outcomes. With this as our model, we sought to make all of our patients “athletes” and treat them as such. Thus, we were not only adjusting *their* expectations, but letting them know that we had *our own* expectations regarding their surgeries. The concept of biopsychosocial factors affecting pain is not new, however, most studies have looked at postoperative and long-term patient pain issues, not at the acute phase.<sup>13,19,20</sup>

Toward this end, we have made use of extensive in-office handouts for many years to take patients through the postinjury, preoperative, and postoperative phases of care. Our program not only includes physical modalities, such as exercises, but also psychological modalities, such as self-talk, goal-setting, and imagery (Table 4). The entire program has been published in a book, *Knee Surgery: The Essential Guide to Total Knee Recovery*,<sup>9</sup> and is available commercially. Also contained in the book is advice for pain control, including the use of non-narcotic medication, such as acetaminophen and ibuprofen, along with the use of ice, massage, and other potential pain-alleviating modalities (Table 2 and 3).<sup>21,22</sup> We also emphasize the team approach used in our clinic, where all employees are familiar with the active, patient-centered program we have developed.

The most controversial piece of the pain puzzle, the use of addictive pain medications, was the focus of our study. Although it seemed we prescribed fewer narcotic pain tablets than our colleagues, we were not certain how many of our own patients used the maximum number of pain tablets prescribed. To our knowledge, our study is the first to look at maximum narcotic use by patients following orthopedic surgery that does not rely on self-reports. We do not know the exact amount of narcotic consumed, however, we do know the upper limit.

Further emphasizing expectations, we discuss preoperatively that a large percentage of patients who underwent simple knee arthroscopy in our clinic survey related that their postoperative pain could be controlled with nonsteroidal anti-inflammatory drugs, such as ibuprofen or naproxen, and no narcotic was needed. Regarding open surgeries, such as ACL reconstructions, most patients were off all narcotic medication by postoperative day 3. Until we performed our study, we were actually unaware of how many patients refilled their narcotic prescriptions. Toward that end, we believe a retrospective design was superior for these data as it eliminated certain bias. We found it interesting when comparing our data to studies on diffuse noxious inhibitory control (DNIC) that though many of our patients did not take any narcotics after a simple knee arthroscopy, 39% used > 10 tablets. Certainly this would speak to a possible altered pain response and might be a path for further investigation. Also of note, patients undergoing bigger surgeries each received a copy of *Knee Surgery: The Essential Guide to Total Knee Recovery*, which includes the complete program regarding sport psychology, as opposed to a series of handouts. Despite the more complex surgical procedure, essentially the same number of patients refilled their prescriptions as those undergoing simple arthroscopy. This could indicate that the full preoperative sport psychology program should be employed for all patients to potentially decrease narcotic use for arthroscopy patients even further.

Use of narcotic pain medicines has engendered a national health crisis, one for which all physicians must be part of the solution.<sup>2</sup> The potential detrimental effects of prescribing large amounts of narcotic medicine can be multiple.<sup>23–25</sup> First, when considerable amounts of narcotic medicine are prescribed, we are giving the expectation that the patient will have significant pain after surgery, and the best treatment is narcotics.<sup>26</sup> Second, many patients feel they should keep taking a medication if the doctor prescribed it, thus they take it beyond the acute-pain phase and run the risk of at least temporary overuse.<sup>27</sup> Third, because patients do not stop their lives for the duration that they take medicine, they often will be driving and doing other activities while taking narcotics. Fourth, it is our belief that while taking narcotics, patients are not as lucid as we would like for the active postoperative therapy program, and thus cannot be as effective performing it. Fifth is the obvious monetary cost.<sup>28</sup> Sixth, and perhaps the most serious problem at this time, is that narcotic drugs often fall into the wrong hands and are used (often by minors) recreationally.<sup>2</sup> There is now strong evidence that many of the recent issues with heroin abuse in our society stems from

**Table 4. Sport Psychology and Preparing for Surgery**

In our approach to treating all of our patients as "athletes," we encourage standard sport psychology techniques, such as those outlined here

Timing for Surgery	There is no good time for surgery, so choose the best time when the patient can dedicate the time and energy needed to get better
Set Up the House	Make sure patients have the house ready for postop recovery, including stocking the refrigerator with postop nutrition, bed placement, clean bandages, etc
Write Down Short-/Long-Term Goals	Putting goals in writing makes a huge difference. Both physical and psychological goals should be considered
Positive Self-Talk	Keeping a positive attitude is vital. The doctor's office can be a big part of this. Don't let people (therapists, spouses) or the patient be negative
Practice Imagery	All senses are incorporated into good imagery
Eliminate "Roadblocks" to Recovery	Things that work against the body's ability to move, perform, or, in this case, heal as perfectly as it can are considered roadblocks. These roadblocks are usually people or psychological in nature, not physical pain
Ignore "Background Noise"	Much of what is going on around (family dramas, etc) is probably unimportant, yet can distract from the rehab process
Be Stubborn and Consistent	Each day leads to the next! Try to quantify progress

non-medical users switching to heroin as it becomes less expensive than prescription opioids.<sup>3,29,30</sup>

When dealing with such an ethereal subject, there are bound to be weaknesses in any research. In our study, 89% of patients required  $\leq 10$  tablets of narcotic pain medicine after common orthopedic operations, with 11% needing  $> 10$  tablets. Interestingly, while we know this is a low number for prescribing, because our study is the first study to publish such data, we are not sure if it indicates high or low use. Secondly, for 33 patients, we did not have data available, indicating they used an out-of-region pharmacy, used other pain medicine, or did not fill their prescriptions.

## Conclusion

Our study establishes that patients will do well postoperatively with minimal narcotic pain medication if expectations are met by using a clear program of multiple physical and psychological modalities. Such limited narcotic use is possible while not compromising patient comfort; furthermore, the fewer narcotic tablets in circulation, the better for long-term societal health.

## Conflict of Interest Statement

Daniel Fulham O'Neill, MD, EdD, and Christopher Webb Thomas, MS, ATC, OTC, disclose no conflicts of interest.

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