

# Preventing Opioid Diversion and Abuse by Using an At-home Opioid Disposal Method: An Improvement Project in a Pediatric Outpatient Surgical Center

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## Abstract:

**Background:** At-home medication disposal systems have been shown to increase proper opioid disposal following cessation of acute postoperative pain. As part of our Opioid Stewardship Initiative, we sought to improve proper opioid disposal by providing an at-home medication disposal product to all patients prescribed opioids for at-home use.

**Methods:** Necessity of opioid dispensation for pain control was at the discretion of an attending anesthesiologist following review of surgical procedure and patient history and physical. Surgical procedure and standardized in-house practice guidelines were used to determine the number of doses dispensed. Based on these assessments, patients and family were provided a medication disposal packet at the time of their preoperative visit with instructions aimed to increase patient and family adherence to proper opioid storage and disposal. Assessment of the successfulness of the implemented methods was evaluated based on patient and family reporting of utilization of the packet method to dispose of unused opioids during their postoperative visit or during follow-up phone sessions.

**Intervention:** Patients prescribed opioids for acute at-home postoperative pain were given a medication disposal packet. An educational flyer describing safe at-home storage and disposal methods was included. Instructions regarding disposal were further iterated by an anesthesiologist during the preoperative visit. Families with unused opioids at the conclusion of the first postoperative meeting were encouraged to dispose of these opioids and given a reminder call 2 weeks after following up on opioid disposal.

**Results:** 452 packets of the at-home disposal product were distributed. There were 355 encounters with unused opioids who were followed up. Of these, 338 (95%) ultimately disposed of their unused opioid. All but 10 families used the at-home disposal product 328 (92%) as provided. A total of 97 were excluded from final analysis due to surgery cancellation (20), failure to follow-up (39), never filled prescription (21), and used all of the prescribed medication (17).

**Conclusions:** Providing an at-home disposal product is a viable method of encouraging proper disposal of unused opioids. The combined cost of the disposal packet plus the instructional flyer was \$1.90 per patient. Additional efforts are being undertaken to evaluate whether follow-up reminder calls at 2 weeks can be simplified to be included in the postoperative follow-up call to increase parent/guardian adherence.

## Introduction

While opioids continue to be prescribed for postsurgical pain, the number of doses varies by prescriber with many receiving an excessive number of doses.<sup>1,2</sup> Large numbers of patients report having unused opioids after resolution of acute pain that are infrequently disposed of in a recommended manner.<sup>3</sup> This excess of opioids provides a source of accidental overdose, diversion, and misuse in children and adults.<sup>2,4,5</sup>

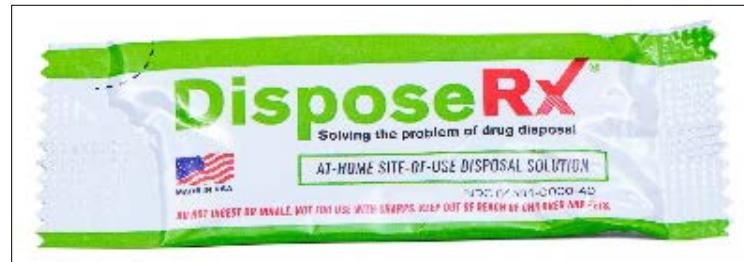
In response to the lack of patient education on proper disposal of unused opioids, studies have been conducted to determine effective ways to address the issue. These studies center on the evaluation of at-home disposal systems usage among the adult and pediatric populations. Results have shown that patients who received an at-home disposal system were more likely to both dispose of unused opioids and to dispose of them in a recommended fashion.<sup>6,7,8</sup>

As part of our site's ongoing Opioid Stewardship Initiative, our past internal surveys distributed to patients and their families (N=125) had shown that a majority (95%) had unused opioid following resolution of postsurgical pain. The majority of those families (83%) were unfamiliar with recommended disposal practices. We sought to improve education of and access to proper opioid disposal methods for our patients. In conjunction with our administrative office, the decision was made to provide patients with an at-home medication disposal product. This project is an assessment of the success of our initial project rollout and future viability. At the time of project design, research<sup>6,7,8</sup> on the efficacy of the at-home disposal had yet to be published, so an internal goal of 50% usage was established.

## Methods

This study was undertaken as a quality improvement project. It was reviewed by an institutional review board and was determined to not be a human research project under federal regulation 45 CFR 46.102(I) and associated guidance.

At our facility, we provide pediatric orthopaedic and plastic surgery care by staff anesthesiologists,



**Figure 1.** DisposeRx is an at-home drug disposal product.

pediatricians, and surgeons. We employ an anesthesia home care model where acute postsurgical pain, including at-home pain, is managed by anesthesiologists who prescribe at-home oral pain medication. At-home oral analgesia is some combination of scheduled acetaminophen (APAP), non-steroidal anti-inflammatory (NSAID), and gabapentinoid, plus an opioid if needed. All patients and guardians meet with an anesthesiologist prior to surgery for clearance, and prescriptions are written at the time of the preoperative visit.

Opioid dispensation to patients for pain control was determined at the discretion of an attending anesthesiologist. Surgical procedure and standardized in-house practice guidelines were used to determine the number of doses dispensed. Based on these assessments, patients and family were provided a medication disposal packet at the time of their preoperative visit with the anesthesiologist (Figure 1). Click this [link](#) for a video demonstration of DisposeRx.

Along with the disposal packet, patients and family also received instructional guidance aimed at increasing patient and family adherence to proper opioid storage and disposal. The successfulness of the implemented methods was evaluated based on patient and family reporting of utilization of the packet method to dispose of unused opioids during their postoperative visit or during follow-up phone sessions.

## Intervention

We instituted our intervention program beginning in May 2019. Every patient prescribed an opioid for acute at-home postsurgical pain was given three things: (1) a packet of an at-home disposal product (DisposeRx,

Sanford, NC, USA), (2) an educational flyer describing safe at-home storage of medications and how to use the DisposeRx, and (3) instructions by an anesthesiologist to the patient's parent or guardian on how to dispose of unused opioids using DisposeRx after surgical pain has subsided (Figure 2).

In our current practice, anesthesiology meets the patient and guardians during their first postoperative visit with the surgeon (scheduled for 1-4 weeks after surgery) to discuss any postsurgical anesthesia-related issues as well as post-surgical pain; including opioid usage. It is during this meeting that guardians are asked if unused opioids were disposed of and if DisposeRx was used. Families that had unused opioid and had not disposed of them were instructed to do so and given a reminder call 2 weeks afterward by anesthesiology following up on opioid disposal and method (Figure 3).

For patients who did not receive the DisposeRx prior to surgery, they were given the product with instructions at the first postoperative meeting. Within 2 weeks of the postoperative meeting, patients and their guardians received a follow-up phone call to discuss disposal of their opioids and then reminded another 2 weeks afterward if needed.

The number of patients given DisposeRx, had unused opioid following resolution of pain, disposed of unused opioid, and disposed of unused opioid with DisposeRx was tracked. Additionally, the point in time at which they disposed of their unused opioid (before or after reminder) was noted.

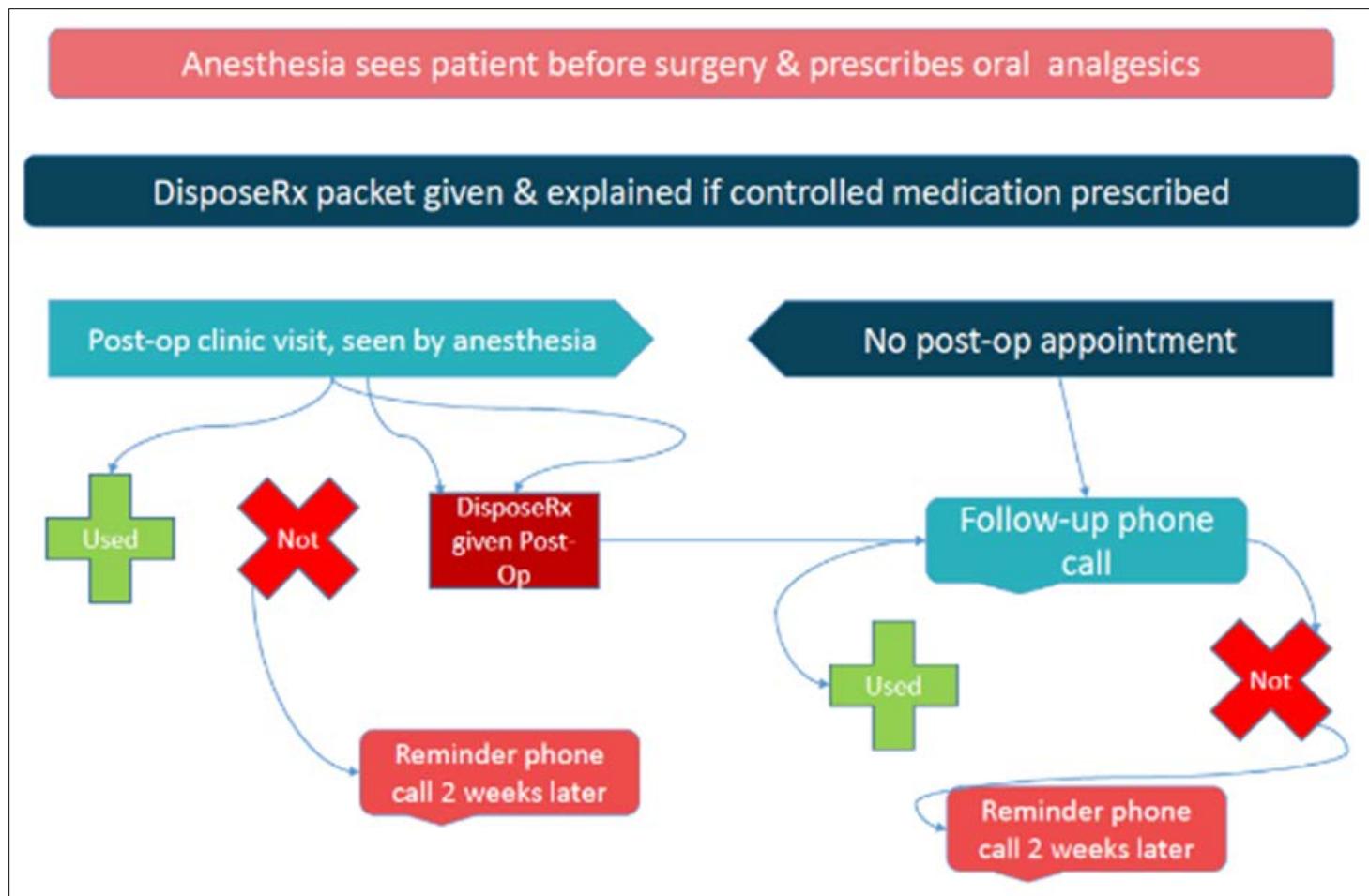
## Results

In total, 463 patients received DisposeRx along with an instructional flyer and verbal instructions. Patients excluded (n=108) from the final analysis included 20 patients whose surgery were cancelled, 38 patients who had no unused opioid (all used or not picked-up), 11 patients who underwent serial surgeries and their



**Figure 2.** An educational flyer describes safe at-home storage of medications and how to use the DisposeRx.

guardians were instructed to safely store their unused opioid until surgeries complete, and 39 families who were either not seen after surgery or unable to be contacted for a reminder. This left 355 patients with unused opioids who were able to be followed up with. Of these families, 338 (95%) ultimately disposed of their



**Figure 2.** Anesthesia workflow for providing DisposeRx and follow-up

unused opioid; all but 10 of these families used DisposeRx 328 (92%). Further breakdown of those who disposed showed that 263 families (78%) disposed prior to returning to clinic for the first time and 75 (22%) disposed by the time of the reminder call. Seventeen families (5%) did not dispose of their unused opioid at the time of the reminder phone call.

## Discussion

Among those patients with an unused opioid whom we were able to follow up with, the use of DisposeRx (92%) exceeded our initial goal of 50% usage. If we extend our consideration to all patients who were given DisposeRx (N = 463), usage (n = 328; 71%) still exceeded our goal. Our overall usage rate is higher than published results, 54.9% – 64.9%.<sup>6,7,8</sup> We hypothesize that greater usage

could be related to a combination of DisposeRx being given to the patient by a physician and the repeated reminders to dispose of unused opioid.

The combined cost of DisposeRx plus the instructional flyer came at a cost of \$1.90 per patient. The cost of additional time of the anesthesiologist for product introduction and follow-up phone calls was not tabulated and factored. Internally, anesthesiology did not find introduction of the product to the patient to significantly impact their workflow or time spent with patient. Follow-up reminder phone calls were reported to be onerous due to availability of patient guardians to field the call and the availability of interpreters. Since completion of this initial rollout, we have made changes to our project implementation to reduce reliance of

follow-up calls delegated solely to our anesthesia team. As part of their practice, our care coordinators follow-up with our patients and their families within 72 hours after surgery. During this call, they remind patients to dispose of their unused opioids. With the changes in the calling protocols, we then track our patient's opioid disposal at their first postsurgery clinic appointment. With the implementation of these new changes, we can assess the effect of the extra reminder before clinic on opioid disposal to see if it further increases our usage goals.

Limitations of this project include reliability of patient responses, as actual action of the patient could not be verified. Additionally, patients could feel internal pressure to report disposal when questioned.

The method of disposal is an important consideration as well. The United States Food and Drug Administration (FDA) recommends flushing as one of the methods for opioid disposal.<sup>9</sup> This method is discouraged by the United States Environmental Protection Agency (EPA) along with municipal water authorities due to the risk of water contamination. A 2017 study from the Puget Sound Mussel Monitoring Program found detectable levels of oxycodone in bay mussels in Seattle, Washington.<sup>6</sup> Thus, while the FDA recommends flushing, providing an at-home disposal method provides families with a safer alternative.

Prior studies on this topic were randomized controlled trials showing positive benefit of at-home disposal products. Our work shows that providing patients with an at-home disposal product in a clinical practice can be feasible and successful. It is our belief that other healthcare systems should consider providing patients with an at-home disposal option. Those systems would need to individually tailor implementation in a manner that would best fit their practice.

## References

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Updated February 2019. Accessed September 16, 2020.