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Effect of drug disposal bag provision on families' disposal of children's unused opioids

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Abstract

Background: One strategy to combat opioid misuse is to remove excess opioids from circulation by providing patients with drug disposal products that enable safe disposal of opioids.

Objective: We aimed to evaluate opioid use and disposal of unused opioids among children and young adults before and after pharmacy staff at our institution began to provide patients and families filling opioid prescriptions with a drug disposal bag.

Design/Methods: We performed a prospective pre-post cohort study of patients who filled an opioid prescription in May-August 2019 at the outpatient pharmacies of a large tertiary children's hospital. Patients and caregivers were enrolled at the time opioids were dispensed. During the first half of the study period, standard opioid-related education was offered by pharmacy staff. During the second half of the study period, standard education was offered and a drug disposal bag and instructions on its use were provided when opioids were dispensed. A follow-up survey to assess opioid use and disposal was completed online or by telephone 4-7 weeks after opioids were dispensed.

Results: A total of 215 participants were enrolled; 117 received a drug disposal bag and 98 did not. Sixty-eight percent of participants completed a follow-up survey. In both groups, median patient age was 11 years, and most patients had been prescribed opioids after a procedure. More

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than 70% had opioids leftover after they had stopped taking them, and this did not vary by group. However, among families with leftover opioids, receipt of a drug disposal bag was associated with a higher likelihood of disposal of the unused opioids (71.7% vs. 52.1%, p=0.04).

Conclusion: Providing a drug disposal bag to families of children receiving opioids increases the likelihood of excess opioid disposal. Greater availability of drug disposal products can complement prescribing reduction efforts aimed at decreasing prescription opioid misuse.

Background

Excess prescription opioids continue to play a role in the ongoing opioid epidemic.[1] Although the amounts of opioids prescribed for acute pain management after injury or surgery vary widely across providers[2–4], it is now well known that these medications are often prescribed in excess[2,5] and rarely disposed of properly.[6–8] Many providers have reduced their prescribing in recent years, through provider and health-system initiatives as well as in response to government policies.[9,10] However, few studies have reported interventions that successfully increase patients' disposal of excess opioids. We previously performed a randomized clinical trial to examine the effect of drug disposal bag provision on the rate of proper opioid disposal among pediatric surgical patients and found that patients who received a disposal bag were 20% more likely to dispose of their excess opioids.[11] However, this previous study was limited to patients undergoing otolaryngologic or urologic surgical procedure, and nearly all patients were under age 6 years of age. Thus, the present study aimed to determine whether drug disposal bag provision increases the rate of opioid disposal among all families of children receiving outpatient opioids.

Objectives

The primary objective of this study was to evaluate the impact of drug disposal bag provision on proper opioid disposal among families filling opioid prescriptions. Our secondary objective was to evaluate whether the impact of drug disposal bag provision on opioid disposal varies by patient age or opioid formulation.

Methods

We performed a prospective observational pre-post cohort study comparing patients and families who received 1) only our hospital's standard educational handout on opioid use, storage, and disposal (Phase I)[12] or 2) a drug disposal bag (Deterra®, Verde Technologies, Minnetonka, MN) and instructions on its use along with the hospital's standard educational handout on opioid use, storage, and disposal (Phase II). All families were also offered counseling by the pharmacist on proper opioid use, storage, and disposal. The drug disposal bag used in this study is a small resealable bag containing activated charcoal. When water and an unwanted medication are added to the bag and shaken, the medication is rendered inert and unusable.[13] We included parents or legal guardians filling an opioid prescription for their child (age <18 years) and adult patients (age ≥ 18 years) filling their own opioid prescription at one of our institution's outpatient pharmacies. We excluded patients or caregivers who did not speak English or who were unable or unwilling to complete a follow-up survey. Of note, no participants in this study had also participated in our previous study.[11]

Importantly, throughout the entire study period, the state of Ohio's policy limiting the days-supply and morphine equivalent dose of opioid prescriptions for acute pain, including postoperative pain, was in place. This policy limits opioid prescriptions for acute pain to an average of 30 morphine equivalent dose and a 7-day supply for adults and 5-day supply for children, though physicians can use their discretion to make exceptions for severe pain.

Enrollment and Intervention

The Institutional Review Board at Nationwide Children's Hospital approved this study as a minimal risk study with a waiver of the need for written informed consent. Ambulatory pharmacy staff were trained on how to use Deterra drug disposal bags and how to enroll study participants. At the time that a young adult patient, or parent/guardian on behalf of their child, picked up an opioid prescription at one of our hospital's outpatient pharmacies, a pharmacy staff member informed them about the study using a standardized script. If the patient or parent/guardian was interested in participating, their name and contact information was recorded. During the first six weeks of the enrollment period (Phase I), the study participants were given only our hospital's standard education on opioid storage and disposal. During the second six weeks of the enrollment period (Phase II), study participants were given our hospital's standard education on opioid storage and disposal, as well as a drug disposal bag and instructions on its use. All study participants were initially contacted four weeks after filling their opioid prescription to complete the follow-up survey, and surveys were permitted to be completed up to seven weeks after the opioid prescription had been filled. Survey questions asked about opioid use, storage, and disposal as well as the patient's age, type of opioid prescribed, and reason the opioid was prescribed. Participants were mailed a $25 debit card after they completed the survey.

Statistical Methods

We compared patient characteristics and outcomes by study phase using t-tests or Mann Whitney U tests for continuous variables and Pearson chi-square tests or Fisher exact tests for categorical variables. Heterogeneity of the effect of the intervention by patient age (<12, ≥12 years) and opioid formulation (pills, liquid) was explored on the additive and relative scales using linear and log binomial regression models, respectively, that included intervention group, either patient age or opioid formulation, and an interaction between these factors. SAS version 9.4 (SAS Institute Inc., Cary, NC) was used for the statistical analyses.

Sample Size and Power

Based on the results of our previous randomized trial in pediatric surgical patients, we expected the opioid disposal rate to increase by 20% among the families in this study who received a drug disposal bag.[11] Using a type I error rate of 5%, to achieve 80% power to detect a 20% effect size with an assumed baseline disposal rate of 65%, we determined we would need to enroll 162 participants in our study, assuming a 10% rate of loss to follow-up. However, because we identified early in the course of the study that our rate of loss to follow-up was approximately 30% rather than 10%, we elected to enroll 215 participants.

Results

A total of 215 participants agreed to participate in our study (N=98 during the first 6 weeks of enrollment (Phase I) when no drug disposal bags were distributed and N=117 during the second 6 weeks of enrollment when drug disposal bags were distributed (Phase II). A total of 63 Phase I participants (64%) and 83 Phase II participants (71%) completed a follow-up survey 4-7 weeks after filling their or their child's opioid prescription. We collected only contact information at the pharmacy counter and did not review patient medical records, so we cannot determine whether those families who completed the follow-up survey differed in any way from those who did not.

The majority of participants were patients under the age of 18, with a median age of 11 years (Table 1). During both study phases, most opioids were prescribed for acute pain after a procedure, but patients who were given a drug disposal bag were more likely to have received their prescription after an injury. Liquid opioid medication was slightly more commonly prescribed than pills in our cohort, with no significant difference between patients who did and did not receive a drug disposal bag (Table 1).

The majority of patients used none or less than half of their opioid medication, and there was no difference between groups in either the amount of or number of days that opioid medication was used (Table 2). Opioids were also stored in similar locations across groups, with approximately 60% of families storing their medication on a counter or in an unlocked box, closet, cabinet, or drawer. More than 70% of patients in each group still had opioid medication leftover after they had stopped taking it. Not surprisingly, patients with chronic or recurrent pain were more likely to still be using or planning to use their remaining opioids at the time of survey completion (21.4% vs. 3.8%, p=0.03). Participants who indicated this or who indicated they had no opioids leftover after they had stopped taking them were not asked whether they had disposed of their opioids. Of those who had opioids leftover, families who were given a drug disposal bag were significantly more likely to dispose of their leftover opioids (52.1% standard care; 71.7% Deterra group; p=0.04). The method of disposal also differed significantly by group. Patients and caregivers in the standard care group most commonly disposed of their medication by flushing it down the toilet or pouring it down the sink (68.0%), whereas patients and caregivers who received a drug disposal bag most commonly used the bag to dispose of their opioids (95.4%) (Table 2). The most common reason that families in both groups had not disposed of their leftover opioid medication was that they intended to but just had not yet gotten around to it (Table 2). There were no significant differences in the effect of drug disposal bag provision on the rate of disposal of leftover opioids by either opioid formulation or patient age (all p>0.30, data not shown). However, when considering the entire study cohort, opioid disposal was more common among families in which the patient had received liquid opioid medication as compared to pills (69.1% vs. 46.5%, p=0.004). Opioid disposal also tended to be less common among those with vs. without chronic or recurrent pain (28.6% vs. 65.4%, p=0.10), but this difference was not statistically significant due to the small number of patients with chronic or recurrent pain.

Discussion

This prospective study of pediatric patients and families served by the outpatient pharmacies of a tertiary children's hospital demonstrates that provision of a drug disposal bag along with instructions on its use significantly increases the disposal of excess opioids. Recent efforts nationwide to reduce the availability of excess opioids have been multifaceted, targeting both prescribing patterns as well as the proper storage and disposal of opioids. The options for proper opioid disposal according to the United States' Food and Drug Administration (FDA) include take-back options and flushing the medication down the toilet if approved by local authorities. The FDA also recommends mixing medications with an unpalatable substance and then throwing them in the garbage, but this is not recommended for opioids due to their potential to cause significant harm.[14] Unfortunately, a 2019 study of nearly 1500 pharmacies and police stations nationwide found that only 60% of police stations and less than 20% of pharmacies reported they accept unused opioids.[15] In addition, even when available, takeback options can be inconvenient for many families. Therefore, other options to improve excess opioid disposal are needed.

One recent option that has been studied is the provision of a pre-paid, U.S. Drug Enforcement Agency-approved envelope to provide patients and caregivers the option of safely mailing back their opioids. This method was recently studied at one pediatric hospital, which reported that only 19.3% of 355 patients or caregivers given one of these envelopes utilized it to return their medication.[16] In contrast, in our study, patients and caregivers who were provided a drug disposal bag disposed of their opioids more than 70% of the time, nearly always by using the bag they received. Another option to improve opioid disposal is patient education. A recent randomized trial in the pediatric population by Voepel-Lewis et al. found that providing a disposal method (a bag of coffee grounds and instructions on how to mix the grounds with medication) in conjunction with risk-enhancement education increased the rate of timely disposal of excess opioids.[17] However, in that trial, families who received either the disposal method alone or education alone had rates of opioid disposal that were similar to those who received both interventions. In contrast, though both groups in our cohort received standard education about opioid disposal, the provision of a drug disposal bag increased opioid disposal by 20%.

Studies evaluating the effectiveness of drug disposal bag provision to improve opioid disposal in adult patients have found similar results. For example, one recent study randomized adult ambulatory surgery patients to receive either the institution's standard of care, an educational pamphlet with information on Drug Enforcement Administration authorized disposal locations, or a drug disposal bag containing activated charcoal.[18] This study found a rate of opioid disposal of 57% in the disposal bag group, which was significantly higher than the rate of 29% in the standard care group and 33% in the education-only group. Another single-center study of adult patients undergoing elective surgical procedures found that patients who received a drug disposal bag containing activated carbon and opioid-related educational materials were 20% more likely to dispose of their opioids compared to patients who received standard care (55% vs 35%).[19] Our current study found a somewhat higher rate of opioid disposal among families of pediatric patients given a drug disposal bag (71.7%) than these studies of adults, but the rate found in

this study is somewhat lower than the rate identified in our previous trial evaluating pediatric surgical patients given a drug disposal bag (85.7%).[11] This may be due to nearly all patients in that trial being prescribed liquid opioid medication, which we've found in the present study to be associated with a greater rate of disposal than medication in pill form. Nevertheless, these studies across both adult and pediatric patients consistently demonstrate that the provision of drug disposal bags increases proper opioid disposal. Our study also provides evidence that provision of a drug disposal bag and education on its use increases opioid disposal in the pediatric and young adult population regardless of the indication for the opioid prescription, the patient's age, or the opioid's formulation. This evidence supports the continuation and expansion of efforts by many pharmacy chains to provide drug disposal bags or pouches to patients filling opioid prescriptions.[20–22] As educators of all patients and caregivers who fill opioid prescriptions, pharmacists can play a critical role in reducing the presence of excess opioids in the community by offering drug disposal bags to the patients and families they serve.

This study had several limitations. First, this study was performed at the outpatient pharmacies of a single tertiary children's hospital. Thus, our results may not be generalizable to the families of all children and young adults prescribed opioids in the United States. In addition, the majority of participants in this study were adult caregivers of children undergoing needed procedures. This sample is not representative of adults prescribed opioids for their own use. Also, with an average patient age of 11 years, the findings of this study may not generalize to relatively independent adolescents or young adults who manage their own medications, though we found no difference in the effect of drug disposal bag provision by patient age. The results of this study also likely do not generalize to children with chronic or recurrent pain. These patients comprised <10% of participants in this study, and they were more likely to still be using or planning to use their opioids at the time of survey completion. Second, as all data were self-reported, it is possible that there was some reporting bias, with some families falsely reporting opioid disposal. However, as all families were informed of the importance of disposing of unused opioids, we believe that this reporting bias was likely non-differential. We chose not to require physical or photographic evidence of opioid disposal because this was a pragmatic study of an intervention already shown to be effective in pediatric surgical patients. Thus, we aimed to minimize both staff and participant burden. It is also certainly possible that some families were driven to dispose of their child's opioids only because of their involvement in the study. However, we also expect that any bias caused by this "Hawthorne effect" was non-differential. Finally, the drug disposal bags used in this study cost $5-7 per bag when not purchased in bulk. Many patients and families may not be willing or able to pay out of pocket for these products. Thus, providing these products to patients and families at no cost, as done in this study, is most likely to increase their use for opioid disposal.

Conclusion

Despite reductions in opioid prescribing, most patients continue to use less than half of the opioids they receive. Thus, the timely and proper disposal of excess opioids remains important. Providing drug disposal bags to families of children receiving opioids increases the likelihood of excess opioid disposal. Greater availability of drug disposal products can

complement ongoing prescribing reduction efforts aimed at decreasing the misuse of prescription opioids.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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References

1. Kolodny A, Courtwright DT, Hwang CS, et al. The prescription opioid and heroin crisis: a public health approach to an epidemic of addiction. Annual review of public health. 2015;36:559–574.
2. Hill MV, McMahon ML, Stucke RS, Barth RJ Jr. Wide Variation and Excessive Dosage of Opioid Prescriptions for Common General Surgical Procedures. Ann Surg. 2017;265(4):709–714. [PubMed: 27631771]
3. Larach DB, Waljee JF, Hu HM, et al. Patterns of Initial Opioid Prescribing to Opioid-Naive Patients. Ann Surg. 2018.
4. Sabatino MJ, Kunkel ST, Ramkumar DB, Keeney BJ, Jevsevar DS. Excess Opioid Medication and Variation in Prescribing Patterns Following Common Orthopaedic Procedures. J Bone Joint Surg Am. 2018;100(3):180–188. [PubMed: 29406338]
5. Voepel-Lewis T, Wagner D, Tait AR. Leftover prescription opioids after minor procedures: an unwitting source for accidental overdose in children. JAMA Pediatr. 2015;169(5):497–498. [PubMed: 25798880]
6. Bicket MC, Long JJ, Pronovost PJ, Alexander GC, Wu CL. Prescription Opioid Analgesics Commonly Unused After Surgery: A Systematic Review. JAMA Surg. 2017;152(11):1066–1071. [PubMed: 28768328]
7. Monitto CL, Hsu A, Gao S, et al. Opioid Prescribing for the Treatment of Acute Pain in Children on Hospital Discharge. Anesth Analg. 2017;125(6):2113–2122. [PubMed: 29189368]
8. Kennedy-Hendricks A, Gielen A, McDonald E, McGinty EE, Shields W, Barry CL. Medication Sharing, Storage, and Disposal Practices for Opioid Medications Among US Adults. JAMA Intern Med. 2016;176(7): 1027–1029. [PubMed: 27295629]
9. Wetzel M, Hockenberry J, Raval MV. Interventions for Postsurgical Opioid Prescribing: A Systematic Review. JAMA Surg. 2018.
10. Mahan ST, Feldman L, Cheng C, DiFazio RL. Assessment of Current Narcotic Prescriptions in Orthopaedics at Boston Children's Hospital. The Orthopaedic Journal at Harvard Medical School. 2017;18(6 2017).
11. Lawrence AE, Carsel AJ, Leonhart KL, et al. Effect of Drug Disposal Bag Provision on Proper Disposal of Unused Opioids by Families of Pediatric Surgical Patients: A Randomized Clinical Trial. JAMA Pediatrics. 2019;173(8):e191695–e191695.
12. Important Things to Know when Taking Opioids. Helping Hand™ https://www.nationwidechildrens.org/family-resources-education/health-wellness-and-safety-resources/helping-hands/important-things-to-know-when-taking-opioids. Accessed 12/7/2018.
13. Lee JS, Hu HM, Brummett CM, et al. Postoperative Opioid Prescribing and the Pain Scores on Hospital Consumer Assessment of Healthcare Providers and Systems Survey. JAMA. 2017;317(19):2013–2015. [PubMed: 28510669]
14. FDA US. Disposal of Unused Medicines: What You Should Know. 2019 Accessed 4/12/2020.

15. Iobst CA, Singh S, Samora JB. Evaluation of opioid disposal opportunities in the United States. Current Orthopaedic Practice. 2019;30(5):439–443.
16. Adler AC, Yamani AN, Sutton CD, Guffey DM, Chandrakantan A. Mail-back envelopes for retrieval of opioids after pediatric surgery. Pediatrics. 2020;145(3).
17. Voepel-Lewis T, Farley FA, Grant J, et al. Behavioral Intervention and Disposal of Leftover Opioids: A Randomized Trial. Pediatrics. 2020;145(1).
18. Brummett CM, Steiger R, Englesbe M, et al. Effect of an Activated Charcoal Bag on Disposal of Unused Opioids After an Outpatient Surgical Procedure: A Randomized Clinical Trial. JAMA Surgery. 2019;154(6):558–561. [PubMed: 30916733]
19. Stokes SM, Kim RY, Jacobs A, et al. Home Disposal Kits for Leftover Opioid Medications After Surgery: Do They Work? Journal of Surgical Research. 2020;245:396–402.
20. Baig EC. Walmart takes on opioid crisis, offering free solution to safely dispose of unused meds. https://www.usatoday.com/story/money/2018/01/17/walmart-takes-opioid-crisis-offering-free-solution-safely-dispose-unused-meds/1039548001/. Accessed 2/12/2018.
21. Walmart Launches Groundbreaking Disposal Solution to Aid in Fight Against Opioid Abuse and Misuse [press release] Bentonville, AR, 1/17/2018.
22. Rite Aid. Rite Aid Makes Free Opioid Disposal Solution Available At More Than 2,500 Pharmacies Nationwide. https://www.riteaid.com/corporate/news?p_p_id=riteaidpressreleases_WAR_riteaidpressreleasesportlet&p_p_lifecycle=0&p_p_state=normal&p_p_mode=view&p_p_col_id=column-3&p_p_col_pos=2&p_p_col_count=3&_riteaidpressreleases_WAR_riteaidpressreleasesportlet_action=getNewsRoomDetail&itemNumber=2115. Accessed 1/30/2019.

Key points:

What was already known:

- Excess prescribed opioids contribute to the opioid epidemic.
- Proper disposal of excess opioids decreases access to opioids but is not often performed.

What this study adds:

- Pharmacist provision of a drug disposal bag to pediatric patients and their families filling an opioid prescription increases opioid disposal.
- Greater availability of drug disposal products may complement ongoing prescribing reduction efforts aimed at decreasing the misuse of prescription opioids.

Table 1.

Participant Characteristics

Characteristic	No drug disposal bag (N=63)	Received a drug disposal bag (N=83)	P
Type of participant			0.70
Parent/guardian	61 (96.8)	78 (94)	
Patient ≥ 18 years of age	2 (3.2)	5 (6)	
Age in years of the patient prescribed opioids	11 (5-15)	11 (7-15)	0.49
Reason opioids were prescribed			
Procedure/surgery	57 (90.5)	66 (79.5)	0.07
Injury/burn	3 (4.8)	15 (18.1)	**0.02**
Chronic or recurrent pain	7 (11.1)	7 (8.4)	0.59
Opioid formulation			0.59
Liquid	37 (58.7)	45 (54.2)	
Pills	26 (41.3)	38 (45.8)	

Data are shown as N (%) or Median (IQR).

Table 2.

Participant Outcomes

Outcome	No drug disposal bag (N=63)	Received a drug disposal bag (N=83)	P
Amount of opioid medication used			0.66
None	11 (17.5)	9 (10.8)	
Less than half the pills/bottle	22 (34.9)	30 (36.1)	
About half the pills/bottle	8 (12.7)	17 (20.5)	
Nearly all the pills/bottle	10 (15.9)	9 (10.8)	
All of the pills/bottle	10 (15.9)	15 (18.1)	
More than the entire initially prescribed amount (got a refill)	2 (3.2)	3 (3.6)	
Number of days opioid medication was used			0.61
0	11 (17.5)	9 (10.8)	
1-3	27 (42.9)	42 (50.6)	
4-7	14 (22.2)	16 (19.3)	
>1 week	11 (17.5)	16 (19.3)	
Opioid storage location			0.90
High counter (out of reach of young children)	20 (31.8)	25 (30.1)	
Low counter	4 (6.4)	5 (6)	
Unlocked closet, cabinet, or drawer	14 (22.2)	22 (26.5)	
Purse, backpack, or other carrier	2 (3.2)	5 (6)	
Locked box, closet, cabinet, or drawer	23 (36.5)	26 (31.3)	
Any opioid medication leftover after patient stopped taking it?			0.87
Yes	48 (76.2)	60 (72.3)	
No	12 (19.1)	18 (21.7)	
Still using or planning to use	3 (4.8)	5 (6)	
Disposed of leftover opioids (N=48, 60)			**0.04**
Yes	25 (52.1)	43 (71.7)	
No	23 (47.9)	17 (28.3)	
Method of disposal (N=25, 43)			**<0.001**
Flush it down the toilet or pour it down the sink	17 (68)	0 (0)	
Throw it away in the trash as is	1 (4)	0 (0)	
Throw it away in the trash after combining with kitty litter, used coffee grounds, or similar substance	1 (4)	0 (0)	
Throw it away using a drug disposal pouch	0 (0)	41 (95.4)	
Take it to a drug take back drive	2 (8)	0 (0)	
Take it to a law enforcement agency	1 (4)	0 (0)	
Take it to an authorized pharmacy	3 (12)	2 (4.7)	
Reasons for not yet disposing of the leftover opioid pain medication (N=23, 17)			
It’s inconvenient	1 (4.4)	0 (0)	1.0

Outcome	No drug disposal bag (N=63)	Received a drug disposal bag (N=83)	P
I'm not sure how to get rid of it	2 (8.7)	0 (0)	0.50
I want to keep it in case my child needs it later	6 (26.1)	6 (35.3)	0.73
I want to keep it in case someone else in my household needs it later	0 (0)	1 (5.9)	0.43
I wasn't told how to dispose of it	1 (4.4)	0 (0)	1.0
I plan to dispose of it, I just haven't gotten around to it yet	14 (60.9)	11 (64.7)	0.80
Used bag to dispose of any other leftover medications in the home	----	10 (12.1)	----

Data are shown as N (%) or Median (IQR).