Observational pilot study: Assessing utilization rates of safe-disposal systems for acute opioid prescriptions post pharmacist-led counseling

Mary Catherine Platz, PharmD[1]; Erica Shelton, PharmD[2]; Gretchen K. Garofoli, PharmD[3], BCACP, FAPhA; Betsy M. Elswick, PharmD, FAPhA[3]
[1]Marshall University School of Pharmacy, Huntington, WV
[2]Kroger Pharmacy, Marietta, OH
[3]West Virginia University School of Pharmacy, Morgantown, WV

Abstract

Background: While previous studies have highlighted the critical need for safe opioid disposal systems, there is limited information regarding patient utilization of these systems. This study aimed to determine if pharmacist-led education improved patients' use of medication disposal systems.

Methods: An observational pilot study was conducted at a single location of a large community pharmacy chain, enrolling patients receiving acute opioid prescriptions for short-term pain management following an outpatient procedure or inpatient admission. The objective was to determine if in-depth, pharmacist-led disposal counseling had an impact on patient utilization of a safe disposal system. Eligible patients were assigned to either the control or study group and underwent the appropriate counseling. Both groups received standard-of-care pharmacist-led counseling at prescription pick-up, and the treatment group received additional information regarding the disposal system. After three weeks, participants were contacted via telephone to determine if the disposal system was used.

Results: A total of 100 participants were enrolled, with 63 completing the follow-up questionnaire. Among those, 3 participants (4.8%) reported using the safe medication disposal system for the dispensed opioid or an unwanted medication in their household, though it was unclear if these medications were initially co-dispensed with the disposal system. Twenty-seven participants (42.9%) reported no remaining medication, while 6 participants (16.7%) with leftover medication expressed a desire to keep it in case of future pain.

Conclusion: This study demonstrates that patients are unlikely to utilize safe disposal systems for unused opioids, even with pharmacist counseling. These findings highlight the need for further research into effective disposal strategies and the development of more robust interventions to enhance safe medication practices.

Keywords: pharmacist intervention, opioids, medication disposal, medication safety, Appalachia

Background

Opioid misuse is an ongoing public health crisis that impacts patients, their loved ones, and the community at large. According to the 2021 National Survey on Drug Use and Health, 9.2 million people over the age of 12 had misused opioids within the past year. Of those, 8.7 million reported misusing prescription opioids, while 1.1 million reported misusing heroin (these numbers are inclusive of those who reported using both types of opioids throughout the year[1]). The widespread misuse of opioids is consistently reported.

Corresponding Author:
Mary Catherine Platz, PharmD
Marshall University School of Pharmacy
Previous affiliation:
West Virginia University School of Pharmacy
and Kroger Health
1 John Marshall Drive, Huntington, WV, 25755
platzm@marshall.edu

A study by Elliot et al. (2020), examining the correlation between lifetime opioid dependence and adolescents who grew up with opioid prescriptions in the family medicine cabinet,[2] also demonstrates the continuous need for safe medication disposal and pharmacist counseling services.

There is little to no data regarding patient self-disposal of opioid medications, or the impact of pharmacist-led counseling on medication disposal rates. While some studies show the benefit of opioid medication disposal and the need for standard counseling protocols regarding safe medication disposal, no evidence has been presented on how this counseling could potentially affect the usage rate of commercially available disposal products. An international study published by Kamal et al. (2022) focused on patients in three countries, including the United States, and on the disposal of unused or expired medications. Participants from the US most often disposed of unused medications by flushing them down the toilet. This study displayed the need for future research to examine if counseling protocols on proper medication disposal would impact patient medication disposal rates and/or the methods used.[3]

In a previous pilot study (Bunkley et al. 2021), researchers examined medication usage through an automated phone call five weeks after discharge, and concluded that the follow-up period used was too short. Within their cohort, 63% of participants had used or planned to use the disposal product. The study also demonstrated that access to community takeback bins located within the patient's zip code corresponded with nonuse of disposal packets.[4] A commentary published in 2021 aimed to show the need for a Risk Evaluation and Mitigation Strategy (REMS) program focusing on safe dispensing and disposal of opioid medications, and validated the need for change and attention in this area of pharmacy practice.[5]

A Drug Enforcement Agency (DEA) regulation allows pharmacies to collect and destroy non-controlled prescription drugs. Even with this regulation, however, only 1% of US pharmacies have started providing this service.[6] In Marietta, Ohio, for instance, there is only one location with a year-round drug take-back box located within a community pharmacy (it is not the location of this research project nor associated with this study in any way). Marietta is located within Washington County, where the Sheriff's Office had a drug take-back box at one point, but it has been removed. In the surrounding counties (a 50-mile radius), there were six locations to dispose of unwanted medications at the time of this research.[6]

Having the ability to safely dispose of all medications, not just opioids, at or near a patient's home would be beneficial both to patients and to the community. This study examined the difference in utilization of an at-home disposal system for patients who received standard counseling or in-depth education on medication disposal prior to receiving an acute opioid prescription.

Methods

Conducted in Marietta, Ohio, this pilot study aimed to assess the use of a commercially available medication disposal system among patients receiving short-term opioid prescriptions, along with pharmacist-led education, from a single location of a large community chain pharmacy located within a community hospital. Patients being discharged from the hospital or outpatient surgery service created a population with elevated use of acute-opioid prescriptions.

A potential limitation of this site was the sizable surgical patient population. Patients were not excluded based on the type of surgical procedure, and different procedures could have drastically different recovery times and therefore create more potential need of opioid-based pain management.

Potential participants were identified based on eligibility criteria, which included receiving a prescription for an acute opioid medication therapy. Acute opioid treatment in this study was defined as a prescription with no more than a seven-day supply. Participants also needed to be at least 18 years of age and able to speak and read English, and could not be concurrently taking chronic opioid therapies. Based on a review of the Ohio Prescription Drug Monitoring Program (PDMP) profile, participants were screened for chronic use of opioids and excluded from the study if they had been consistently receiving opioid prescriptions anytime within the last 12 months as part of pain management, palliative care, and/or hospice services. Participant information included details on the prescription dispensed, prescribed day supply, type of insurance coverage (if applicable), the person receiving the counseling (patient or caregiver), and other demographic data collected through the community pharmacy dispensing software.

Participants were assigned to one of two groups: the control group, receiving standard pharmacist counseling, or the treatment group, receiving in-depth, pharmacist-provided counseling with additional information regarding the importance of and directions for the use of the dispensed disposal system. In the control group, the standard pharmacist counseling included information on the indication for the medication dispensed, directions for use, and potential side effects, and the pharmacist answered any questions the patient or caregiver had about the medication or condition. These participants received a basic handout detailing instructions for using the disposal product, along with the IRB-approved research cover letter.[7] The treatment group received the standard counseling and the cover letter, and in addition these participants were provided with an in-depth handout demonstrating medication disposal techniques and the importance of using disposal systems, which the pharmacist reviewed with the participant. Upon receiving the medication, each participant was provided with the required pharmacist-led counseling for the appropriate intervention group and given the medication disposal system at no charge, and the contact information for the participant was confirmed.

Twenty-one days after the participant received the medication and disposal system, the primary investigator made the first contact attempt via telephone. (The three-week follow-up period was utilized because all patients had been dispensed a maximum of a 7-day supply.) Three telephone contact attempts were made over one week after the first attempt before the participant was considered lost to follow-up. When a participant was contacted, a set of five standardized questions (Appendix A) was asked by the un-blinded pharmacy resident, who served as the study's primary investigator. Questions were designed to ascertain if the patient had any remaining opioid medication and whether the disposal product was used; depending on utilization, the participant was asked if the system was easy to use or to select the closest applicable reason for not using the disposal system.

Following the completion of the follow-up period, data were analyzed using descriptive statistics to evaluate the objectives.

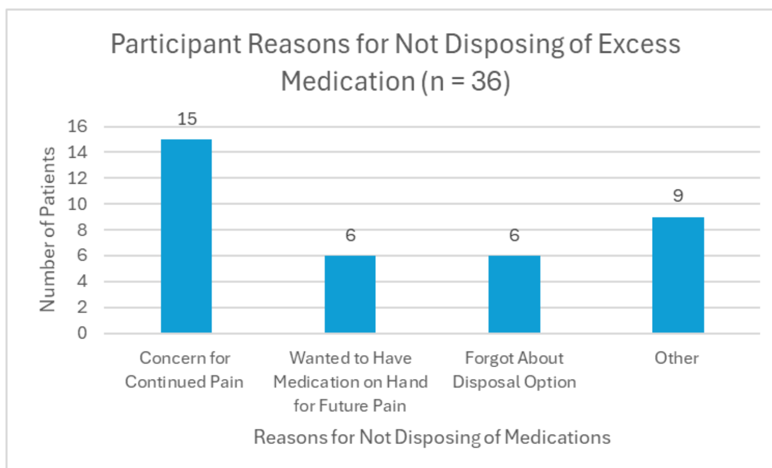
Results

During active recruitment, 100 participants were enrolled in the study, with 50 in each cohort. Of those, 63 were successfully contacted and completed the follow-up questionnaire. The demographics of each cohort were evenly distributed (Table 1), but more women were enrolled than men, with 66 of the total participants being female. The large difference between male and female patients could be an influential factor in the results of the study. Of the participants who completed the follow-up visit, 57.1% (n=36) had opioid tablets remaining after the 21 days. Of the 36 participants who had remaining medication, 36.4% (n=15) reported concern for continued pain as the reason for not disposing of medication at the 21-day mark, while 16.7% (n=6) reported wanting to have the medication on hand for use in case of newly developed, future pain. The remaining 15 patients were split between forgetting about the disposal option (n=6) and "other" (n=9) as the reason for not disposing of the medication (Figure 1). Thirty-five participants were lost to follow-up during the study.

Table 1. Participant Demographics

Demographics (n=100)	
Number of Participants Lost to Follow Up	38
Average Participant Age	55
Number of Male/Female Participants	34/66

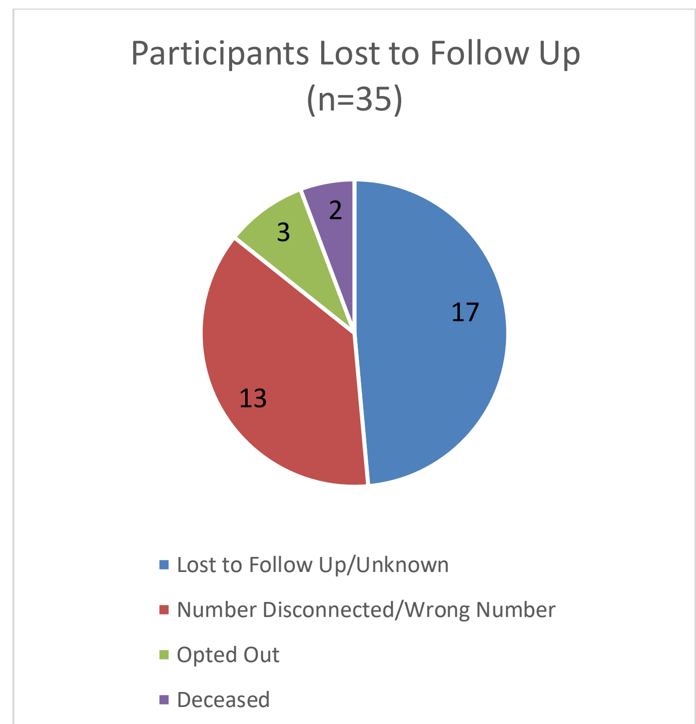
Figure 1. Participant reasonings for not disposing of excess medication according to phone interview



Discussions with patients and caregivers during follow-up calls provided insight into the public opinion on medication disposal. Some participants were attracted to the option of being able to dispose of unwanted medications at home. One such caregiver, for instance, was worried about having opioids in the house due to the loss of a loved one from opioid misuse. Others were not interested, and when asked if they disposed of any of their remaining medication, they stated that it is too hard to get ahold of pain medications when needed so they were saving it for future pain management needs. Some participants mentioned not wanting to waste medications, and looking for ways to safely store medications or to dispose of them at a much later time. Nine participants noted "other" as the reason for not disposing of remaining medication, a result that may be linked to the stigma associated with opioids and the mistrust of healthcare professionals that is commonly seen in the region.

Many participants were lost to follow-up due to unknown reasons or incorrect phone numbers (Figure 2). A total of 35 participants were lost to follow-up, with two of those due to death unrelated to the opioid medication prescribed. This high loss-to-follow-up rate could be due to participants not wanting to participate in a study, distrust in the confidentiality of discussing opioid use, or the stigmas around opioid use.

Figure 2. Representation of reasons for participants lost to follow-up



In total, 3 participants used the medication disposal system. Two of these participants, both of whom were in the control group, used the system for medications other than the opioid prescribed. The participant who used the product for disposal of their remaining opioid medication received additional

counseling (Table 2). These results are limited, but of the three participants who used the disposal system, the only participant to dispose of the excess opioid was part of the treatment group. All participants who used the disposal system were women.

Table 2. Unique Characteristics of Participants Who Used the Safe Medication Disposal System

Utilization of Safe Medication Disposal System			
	Participant 1	Participant 2	Participant 3
Used disposal system for opioid v. other medication	Other Medication	Opioid	Other Medication
Sex of participant	Female	Female	Female
Treatment group	Control (SPC)	Treatment	Control (SPC)
Patient v. caregiver counseled	Patient	Caregiver	Caregiver

*SPC: Standard Pharmacist Counseling

Discussion

The limited use of the disposal system in this study suggests the need for further research in areas of safe medication disposal techniques and methods of safe medication storage in the home.

This study was conducted in Marietta, Ohio, with most patients living in rural areas. Many of the participants lived in or around the Appalachian region, which is home to a culture that relies heavily on conserving resources. A study conducted in 2021 examined access to and perceptions of care in the region. The study concluded that residents of Appalachian Ohio understand the area's limited access to healthcare, and many residents commented on the lack of courtesy of healthcare providers to patients.[8] Personal tendencies and perceptions of the Appalachian culture should be considered when conducting future research on how various professions within healthcare can best serve patients.

One limitation of this study was the lack of restrictions regarding diagnosis for prescribing opioids. In the future, it may be beneficial to use inclusion and exclusion criteria to gather a selective participant pool focused on the length of optimal recovery times, or to limit the type procedures received by patients in the study. These criteria could help identify periods in which participants are more likely to dispose of medications. Additionally, the pharmacy resident responsible for gathering information during the phone interview was not blinded to the assigned study group of the patient, a limitation that could have potential for bias during the collection of questionnaire answers.

The patient response rate was limited within the study, despite contact information being confirmed when the medication was dispensed. The high number of patients lost during follow-up had a direct impact on the results of the study, as the sample size was much smaller than originally anticipated. This change greatly limits the applicability of the results. Patients may have confirmed incorrect phone numbers on purpose to refrain from further communications, or caregivers may have mistakenly confirmed incorrect information.

Another limitation was that patients may not be at their cognitive best after surgery or release from the hospital, and may not retain as much information as they would under normal circumstances. Along with this possibility of cognitive impairment, many caregivers picked up the medications for their loved ones at the hospital pharmacy, leading to a high number of participants for whom the caregiver was the counseled party. Lack of direct patient communication may have played a role in the low use of the disposal systems.

Safe disposal and storage of medications are crucial components in helping patients, families, and communities reduce prescription opioid misuse. Current disposal technologies however, are not being used by patients and families, indicating the need for a new approach.

Conclusion

While the need for safe medication disposal methods is well studied, the utilization of these methods has not been thoroughly evaluated. This study was intended to aid in demonstrating the utilization of safe disposal systems dispensed to patients receiving opioids for acute pain management. Of the contacted participants, 4.8% (n=3) used the commercially available medication disposal system. The lack of usage identified through this study should be further examined through future research that focuses on a narrower patient population.

After the completion of this study, it is evident that more research is needed to assess community pharmacist involvement in safe medication disposal practices. The need for patient education on these practices is apparent, but the reality is that many patients are not willing to dispose of unexpired medications. Perceptions about medication disposal among both patients and healthcare professionals need to be re-evaluated due to the lack of understanding of both parties' opinions and involvement in the process. This study concluded that patients are not likely to dispose of unused medications even after in-depth counseling and education is provided by a community pharmacist, and illustrated the need for more research in the field of patient education and on how safe

medication disposal and storage are handled within the community.

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Appendix A: List of Follow-Up Questionnaire Questions Asked Via Phone Call 21-Days Post Medication Dispensing.

Question	Answer Options
Did you have any of the opioid medication left over?	Yes/No
Did you use the medication disposal packet to discard any remaining opioid tablets?	Yes/No
Did you use the medication disposal packet to discard any other medications you had in your household?	Yes/No
If yes, did you think the disposal system was easy to use?	Yes/No
If no, why did you decide not to use the medication disposal packet to dispose of unused medication?	a. I forgot about the option to dispose of properly b. I was worried my pain would continue from this acute issue c. I wanted to keep it on hand in case I developed another kind of pain in the future d. Other