

## BRIEF REPORT

# Drug Deactivation Pouches for Primary Prevention of Opioid Overdose: Perceptions and Attitudes of Community Members

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**Importance:** A substantial number of opioid analgesics dispensed into communities will go unused and be susceptible to diversion for misuse. Convenient, efficient, and environmentally safe mechanisms for disposal are needed to prevent the diversion of unused opioid analgesics.

**Objective:** This initiative piloted the feasibility of distributing drug deactivation pouches in a community setting and examined community members' acceptance, intention to use drug deactivation pouches, and their current disposal practices of unused opioid analgesics. Although many studies have examined the benefits of deactivation pouches in preventing drug overdose, few have explored community members' perspectives, the feasibility, and the acceptability of these pouches in disposing of unused medications.

**Methods:** In the fall of 2017, we piloted the distribution of drug deactivation pouches to assess the overall interest in the pouches at a 3-day community event and continued the second wave of this pilot in the community from the summer of 2018 to the spring of 2019.

Our main outcomes and measures included the acceptance of the drug deactivation pouches and the intention to use the pouches. "Acceptance" was defined as study participants physically taking the kit and "Intention" was how participants intended to use the pouch.

**Results:** A total of 170 community members were approached at a community event about the drug deactivation pouches and 116 accepted at least 1 pouch (68.2% acceptance rate). In the second wave, 124 community members were approached by Community Health Workers; 100% accepted the pouch. Overall, the acceptance rate was 81.6%. People mentioned significant interest in using the pouches. Furthermore, surveys that assessed community members' intention to use the deactivation pouches showed that 48% intended to use the pouch.

**Conclusions and Relevance:** The distribution of drug deactivation pouches is feasible in a community setting and although community members expressed interest in using drug deactivation pouches to dispose of unused opioid analgesics and other drugs, the majority still disposed of their unused medications through other avenues. This, underscore the need to raise community members' awareness about the importance, benefits, and viability of these pouches as a tool for the primary prevention of opioid overdose because of their ease of use, safety, environmental considerations, and cost-effectiveness. (J Am Board Fam Med 2024;37:112–117.)

**Keywords:** Drug Deactivation Pouches, Drug Overdose, Feasibility Studies, Florida, Intention, Opioids, Substance-Related Disorders

## Introduction

In 2019, the number of opioid prescriptions dispensed by retail pharmacies in the US was 46.7

prescriptions per 100 persons,<sup>1</sup> many of which go unused. Annually, more than 100 million opioid medications are left unused after dental extraction

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in the US.<sup>2</sup> A systematic review of surgical patients who had been prescribed opioids found that 67 to 92% of the patients reported having unused opioids; 42% to 71% of the prescribed opioids were unused.<sup>3</sup> Retaining unused opioid medications in the home may result in diversion<sup>4,5</sup> or accidental poisonings, especially among young children.<sup>6</sup> Thus, ensuring the safety of medications in the family medicine cabinets is a vital step in the fight against the opioid epidemic, as some teenagers' first exposure to opioids is through the family medicine cabinet.<sup>7,8</sup>

Encouraging the disposal of unused or expired prescription medications is one strategy that has been implemented across the United States (US).<sup>9,10</sup> This is important because many community members do not understand the proper disposal of their unused medications,<sup>11,12</sup> but are willing to dispose of unused pain medications if there is an avenue to do so.<sup>13,14</sup> Indeed, there are various methods adopted by various households to dispose of unused medication such as flush in the toilet, discarding in trash bags, take-back programs, and drop boxes.<sup>15</sup> These methods have their drawbacks. For example, medications thrown in trash bags (may leach from landfills into the groundwater and water tables) or flushed in toilets may affect aquatic lives.<sup>16</sup> Prescription drug disposal programs (ie, drop-boxes and take-back events) have been implemented throughout communities in the US with the intent of reducing the availability of prescription drugs for nonmedical use. Drop-boxes are available year-round under constant surveillance by a collector authorized by the Drug Enforcement Administration (DEA).<sup>9</sup> The majority of studies on take-back events and drop-boxes have examined the potential impact of disposal programs on prescription drug availability by examining the number and type of controlled medications disposed of.<sup>5,17,18</sup> Stewart and colleagues<sup>5</sup> showed that only approximately 9.1% of medications at take back events were controlled medications. Although drug disposal programs are regarded as safe, there are several potential drawbacks,

including the scarcity of the collection sites, lack of awareness of the collection sites by the general public and problems with transferring controlled medications to collection sites.<sup>19</sup> Thus, the potential limitations of disposal programs<sup>19,20</sup> and Egan et al.'s finding that less than 1 percent of dispensed opioids are taken to a drug disposal program<sup>17</sup> underscore the need to improve disposal opportunities, especially those that can be done in the home. The drug deactivation pouch contains activated carbon and works via a molecular adsorption technique that can adsorb 98.72% of medications within hours.<sup>21,22</sup>

Many studies<sup>23-25</sup> in the literature on the use of carbon-based deactivation pouches have done so with study participants recruited from the controlled environment such as surgery units of hospitals. These studies<sup>23-25</sup> suggest that patients who were provided a drug deactivation product, in addition to an educational pamphlet, were more likely to dispose unused prescription opioids than patients who only received an educational pamphlet. In this study, using a community sample, we add to the literature by examining, in various community settings, community members' willingness to accept, their intention to use these deactivation pouches to dispose of their unused or expired medications, and what their current disposal practices were.

## Methods

In fall 2017, in this intervention study with cross-sectional study design we piloted the distribution of drug deactivation pouches at a 3-day community festival event in Alachua County, Florida (wave-1). The study staff approached individuals attending the event and briefly described the current local opioid epidemic, potential impact of safely disposing unused prescription opioids on the opioid epidemic and use of the drug deactivation pouch. Each person contacted was assessed regarding acceptance of the pouch. Acceptance of the pouch was defined as study participants physically taking the kit because of need. The study staff spent approximately 18 hours in the field over the 3-day weekend event to distribute the deactivation pouches.

Furthermore, from summer 2018 to spring 2021 we conducted a second wave of the pilot consisting of distribution of the deactivation pouches by community health workers (CHWs) from our community engagement program (HealthStreet). As part of the daily community outreach, the CHWs offered deactivation

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pouches to community members who reported a lifetime opioid medication use history. In addition, 6 months after the second wave pilot started, we introduced a survey (“intention survey”). In this phase, we sought to understand the community member’s willingness to use the deactivation pouch and captured their disposal practices in the past 12 months. Intention referred to how participant intend to use the pouch. By giving out these pouches, the study staff endorsed the conceptual model that community members who do not dispose of their unused medications can use this pouch and those who dispose by other means could use the pouch because it is more efficient, convenient and more environmentally safe.<sup>21</sup> In addition, a stamped postcard was attached to each pouch and community members were asked to mail it back after answering the surveys (survey items assessed whether they used pouch or not, and also their past 12 month disposal practices). The study costs was primarily in man-hours spent in the field by study staff, as the deactivation pouches were supplied free by the Alachua county Department of Health, Health Promotion Wellness coalition. This study was approved by the University of Florida’s Institutional Review Board (UF-IRB).

## Results

As shown in Table 1, of the 170 individuals attending a community event that were approached to distribute the deactivation pouches, 116 individuals accepted the pouches (acceptance rate 68.2%). The community members who accepted a pouch were grateful to have a mechanism to dispose of their unused opioid analgesics at home. Nearly all 54 individuals who did not take a drug deactivation pouch reported that they did not have opioid analgesics in their homes.

Furthermore, in the second wave (wave 2), CHWs distributed 277 drug deactivation pouches to 124 community members (acceptance rate 100%)

(Table 1). Overall, the acceptance rate from the wave-1 and the wave-2 effort was 81.6% (Table 1).

As shown in Table 2, the majority (89%) of those who completed the survey were within the age bracket 26 to 80% and 8% between 18 to 25 years of age. Nearly two-thirds (65%) were females. Further, approximately 52% of community members who completed the intention survey said they intended to use the deactivation pouch in the future and a range of pills was mentioned for which would be disposed of from vitamins to sedatives and stimulants; 98% thought the pouch would be easy to use. Nearly one-third (29%) said they threw away prescription in the trash, and approximately 15% flushed the pills down the toilet/sink. In addition, 13% took their medications to drug drop-box and 3% to drug take-back event. About 4% had no pain medications at home, and 49% did not dispose of prescription pain medication in the past 12 months.

## Discussion

To our knowledge, this is the first study to examine acceptance of and intention to use a deactivation device that can be used in the home to dispose of unused prescription opioids in a community setting. We found that the majority of community members (81.6%) took the pouch and said they were interested in using it. It is possible that the brief education by study staff about the dangers of unused opioids helped the community members saw a need for it and thus decided to accept them. Indeed, anecdotally, many community members expressed the need for the deactivation pouches because they had unused opioids and were not comfortable with their current disposal mechanism such as drop boxes. However, it is also possible that this high acceptance rate may be because they were intrigued about this new product being given free of charge. Furthermore, community distribution has been successfully implemented in

**Table 1. Drug Deactivation Pouch Distribution (Weekend & Wave-2 Pilots)**

	Wave-1 Pilot Distribution N = 170 (100%)	Wave-2 Pilot Distribution N = 124 (100%)	Total
Approached	170	124	294 (100%)
Accepted pouch	116 (68.2%)	124 (100%)	240 (81.6%)
Refused pouch	54 (31.8%)	0 (0%)	54 (18.4%)
Completed Intention survey*	N/A**	164	164 (100%)

Notes. \*Intention survey was introduced 6 months after the wave-2 pilot started.

\*\*N/A, not applicable.

**Table 2. Deactivation Pouches Intention Survey Data**

Survey Questions	Survey Responses	Total = 164	%
Will you use the pouch to dispose of prescription pain medication(s) (e.g., Vicodin, Oxycodone, Codeine, Demerol, Percocet, Darvon, Hydrocodone)?	Yes	78	47.6%
	No	86	52.4%
In the past 12 months, how have you disposed of prescription pain medication(s)?	Flush down the toilet/sink	23	14.0%
	Drug take-back event	6	3.7%
	Other Deactivation pouches (other than this one)	1	0.6%
	Throw out in the trash	46	28.0%
	Drug drop-box	21	12.8%
	Other	0	0.0%
	Not applicable, no one in my household has ever been prescribed pain medications	6	3.7%
Which of these other medications will you dispose of in the pouch?	Not applicable, I did not dispose of prescription pain medications within the past 12 months	83	50.6%
	Over-the-counter (Tylenol, Advil, etc.)	66	40.2%
	Vitamins	40	24.4%
	Other prescription medications (Valium, Adderall, Wellbutrin, Cialis, etc.)	95	57.9%
	Other	30	18.3%
How easy do you think it will be to use the pouch?	None	18	11.0%
	Very Easy	140	85.4%
	Somewhat Easy	21	12.8%
	Not Easy	0	0.0%
What is your sex?	Did not use	1	0.6%
	Female	109	66.5%
Age	Male	55	33.5%
	< 18 years old	0	0.0%
	18 to 25 years old	12	7.3%
	26 to 45 years old	45	27.4%
	46 to 60 years old	53	32.3%
	61 to 80 years old	52	31.7%
	> 80 years old	2	1.2%

many communities in the USA, particularly with naloxone distribution, which has seen excellent community uptake.<sup>26</sup> In addition to community distribution, Varisco and colleagues<sup>27</sup> noted that community members would be willing to dispose of unused opioids if they received these pouches for free when picking up their prescriptions at the pharmacy.

Our survey showed that more than half of the sampled community members were willing to dispose of unused medications using the pouch and nearly half did not intend to use the pouch. Perhaps because the deactivation pouch is a new technology and the public's awareness is not high yet about this device. The fact that majority of the participants currently either flush, discard in trash, drop at drop-box or take

back events means that there is a need to raise public awareness about these pouches if they are to either change from their current method of disposal or adopt a new one in the deactivation pouches. It is also noteworthy that even though the post cards were pre-stamped, few people returned. This was expected as this mode of response to surveys has typically been a low-yield response rate.<sup>28</sup>

Our study has several limitations. Although the results may not be generalizable outside of Florida, they may be consistent for similar communities. Although we know how many community members accepted a deactivation pouch, we do not know if the pouch has been used to dispose of opioid medications.



Our pilot study established the feasibility of distribution and use of drug deactivation pouches in the community as some community members do have interest in disposing of unused opioids using this method. This could help to reduce supply of unused opioids that could eventually be diverted and lead to overdose. Future research is needed to determine if and how community members use deactivation pouches to dispose of unused opioid analgesics.

### Implications for Public Health Practice

The availability of a home-based disposal mechanism promotes safe disposal of opioids, thereby preventing diversion and accidental overdose. Access to these deactivation pouches may improve safe disposal practices as individuals with pouches are approximately 4 times as likely to safely dispose of unused opioid medications.<sup>24,24</sup> Hence, local county governments should form collaborative partnerships with community-based organizations, and nongovernmental organizations to ensure adequate access to these pouches by those who need them. Further, governmental policies and programs encouraging pharmacies to provide deactivation pouches to community members with opioid prescriptions may improve access. Effective public and private partnership in promoting this community-based preventive public health practice will go a long way in combating the opioid crisis.

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To see this article online, please go to: <http://jabfm.org/content/37/1/112.full>.

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