

CADTH RAPID RESPONSE REPORT: SUMMARY OF ABSTRACTS

Drug Deactivation Devices for Disposal of Pain Medications: Clinical Effectiveness, Cost- Effectiveness, and Guidelines

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Authors: Thyna Vu, Suzanne McCormack

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Research Questions

1. What is the clinical effectiveness of at-home drug deactivation and disposal devices for unused medication in preventing harm to patients and/or household contacts?
2. What is the cost-effectiveness of at-home drug deactivation and disposal devices for unused medication in preventing harm to patients and/or household contacts?
3. What are the evidence-based guidelines regarding the use of at-home drug deactivation and disposal devices for unused medication in preventing harm to patients and/or household contacts?

Key Findings

No evidence was identified regarding the clinical effectiveness, cost-effectiveness, or evidence-based guidelines of at-home drug deactivation and disposal devices for unused medication in preventing harm to patients and/or household contacts.

Methods

Literature Search Methods

A limited literature search was conducted by an information specialist on key resources including MEDLINE, the Cochrane Library, the University of York Centre for Reviews and Dissemination (CRD) databases, the websites of Canadian and major international health technology agencies, as well as a focused internet search. The search strategy was comprised of both controlled vocabulary, such as the National Library of Medicine's MeSH (Medical Subject Headings), and keywords. The main search concepts were drug deactivation or drug disposal devices for home use. An additional search was done for guidelines on medications used in the home. Search filters were applied to limit retrieval to guidelines for the additional search only. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2015 and November 12, 2020. Internet links were provided, where available.

Selection Criteria and Summary Methods

One reviewer screened literature search results (titles and abstracts) and selected publications according to the inclusion criteria presented in Table 1. Full texts of study publications were not reviewed. The Overall Summary of Findings was based on information available in the abstracts of selected publications. Open access full-text versions of evidence-based guidelines were reviewed when abstracts were not available, and relevant recommendations were summarized.

Table 1: Selection Criteria

Population	Patients (any age) on any prescription pain medication, and other residents in the same household
Intervention	At-home drug deactivation and disposal devices (e.g., containing activated charcoal/carbon, bentonite clay, calcium hypochlorite, other proprietary or non-proprietary substances)
Comparator	Q1, 2: Drug disposal information (e.g., in-person education, pamphlet); alternate drug disposal practices (e.g., pharmacy take back, dispose in household trash by first mixing with coffee grounds/cat litter, direct disposal in household trash/drain); no disposal information/practice Q3: Not applicable
Outcomes	Q1: Clinical effectiveness and safety for patients and/or household contacts (e.g., reduction in drug misuse, drug addiction, overdose and overdose-related harms, hospitalization, other drug adverse events) Q2: Cost-effectiveness (e.g., quality-adjusted life year, incremental cost-effectiveness ratio, cost per patient adverse event avoided) Q3: Recommendations regarding the use of at-home drug deactivation and disposal devices for unused medication in preventing harm to patients and/or household contacts
Study Designs	Health technology assessments, systematic reviews, randomized controlled trials, non-randomized studies, economic evaluations, evidence-based guidelines

Results

No health technology assessments, systematic reviews, randomized controlled trials, or non-randomized studies were identified regarding the clinical effectiveness of at-home drug deactivation and disposal devices for unused medication in preventing harm to patients and/or household contacts. No economic evaluations were identified regarding the cost-effectiveness of the use of at-home drug deactivation and disposal devices for unused medication in preventing harm to patients and/or household contacts. No evidence-based guidelines were identified regarding the use of at-home drug deactivation and disposal devices for unused medication in preventing harm to patients and/or household contacts.

References of potential interest that did not meet the inclusion criteria are provided in the appendix.

Overall Summary of Findings

No relevant literature was found regarding the clinical effectiveness, cost-effectiveness, or evidence-based guidelines of at-home drug deactivation and disposal devices for unused medication in preventing harm to patients and/or household contacts; therefore, no summary can be provided.

References Summarized

Health Technology Assessments

No literature identified.

Systematic Reviews and Meta-analyses

No literature identified.

Randomized Controlled Trials

No literature identified.

Non-Randomized Studies

No literature identified.

Economic Evaluations

No literature identified.

Guidelines and Recommendations

No literature identified.

Appendix — Further Information

Systematic Reviews and Meta-analyses

Alternative Outcome – Methods of Disposal

1. Constantino VM, Fregonesi BM, Tonani KAA, et al. Storage and disposal of pharmaceuticals at home: a systematic review. *Cien Saude Colet.* 2020 Feb;25(2):585-594.
[PubMed: PM32022198](#)

Randomized Controlled Trials

Alternative Outcome – Disposal Behaviour

2. Voepel-Lewis T, Farley FA, Grant J, et al. Behavioral Intervention and Disposal of Leftover Opioids: A Randomized Trial. *Pediatrics.* 2020 01;145(1):01.
[PubMed: PM31871245](#)
3. 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 Surg.* 2019 06 01;154(6):558-561.
[PubMed: PM30916733](#)
4. 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 Pediatr.* 2019 Jun 24:e191695.
[PubMed: PM31233129](#)

Non-Randomized Studies

Alternative Outcome – Disposal Behaviour

5. Cooper JN, Lawrence AE, Koppera S, et al. Effect of drug disposal bag provision on families' disposal of children's unused opioids. *Journal of the American Pharmacists Association: J Am Pharm Assoc.* 2020 Oct 27;27:27.
[PubMed: PM33127313](#)
6. Hite M, Dippre A, Heldreth A, et al. A Multifaceted Approach to Opioid Education, Prescribing, and Disposal for Patients with Breast Cancer Undergoing Surgery. *J Surg Res.* 2020 Sep 12;257:597-604.
[PubMed: PM32932192](#)
7. Ramel CL, Habermann EB, Thiels CA, Dierkhising RA, Cunningham JL. Provision of a Drug Deactivation System for Unused Opioid Disposal at Surgical Dismissal: Opportunity to Reduce Community Opioid Supply. *Mayo Clin Proc Innov Qual Outcomes.* 2020 Aug;4(4):357-361.
[PubMed: PM32793863](#)
8. Stokes SM, Kim RY, Jacobs A, et al. Home Disposal Kits for Leftover Opioid Medications After Surgery: Do They Work? *J Surg Res.* 2020 01;245:396-402.
[PubMed: PM31425882](#)

Alternative Outcome – Strategies for Improved Opioid Management

9. Lee WC, Hutchison RW, Lin S, Kuo YF. Patient Education on Opioid Storage, Security, and Disposal of Opioids: Should the Approach Differ in Rural and Urban Settings? *Tex J Health Syst Pharm.* 2020;19(1):46-51.
[PubMed: PM33117995](#)

Guidelines and Recommendations

Unclear Methodology

10. Timely Information for Providers in South Carolina. Medication disposal – better safe than sorry. (*TIP SC no.7*). 2019.
https://msp.scdhhs.gov/tipsc/sites/default/files/tipsc_mailer%20med%20disposal_v7_17_hyperlinks.pdf

Devices Not Specified

11. United States Government Accountability Office. Prescription Opioids: Patient options for safe and effective disposal of unused opioids. (*GAO Report to Congressional Committees GAO-19-650*); 2019. <https://www.gao.gov/assets/710/701126.pdf>
See: Federal Agencies Recommend Take-Back Options Whenever Feasible, Followed by Disposal Using the Toilet or Trash (p. 9); FDA Has Not Evaluated Commercial Disposal Methods (p. 15-16)

Review Articles

12. Imarhia F, Varisco TJ, Wanat MA, Thornton JD. Prescription drug disposal: Products available for home use. *J Am Pharm Assoc.* 2020 Jul - Aug;60(4):e7-e13.
[PubMed: PM32067882](#)
13. Yaster M, McNaull PP, Davis PJ. The opioid epidemic in pediatrics: a 2020 update. *Curr Opin Anaesthesiol.* 2020 Jun;33(3):327-334.
[PubMed: PM32371640](#)
14. Community Environmental Health Strategies LLC for San Francisco Department of the Environment. Overview of eight medicine disposal products. 2017.
https://sfenvironment.org/sites/default/files/fliers/files/overviewmedicinedisposalproducts_21april2017.pdf
See: Executive Summary (p. 2); Product Costs for Consumers (p. 23-24); Medicine Disposal Product Descriptions (p. 28-44)

Additional References – Manufacturers' Websites

15. Deterra drug deactivation system. <https://deterrasystem.com/deterra-is-the-solution/>
16. DisposeRx. <https://disposerx.com/>
17. Drug Buster Drug Disposal System. <https://www.medline.com/product/Drug-Buster-Drug-Disposal-System/Pharmacy-Supply/Z05-PF19622?question=drug+buster&index=P1&indexCount=1>
18. Element MDS. <https://elementmds.com/>
19. The Pill Catcher. <http://www.thepillcatcher.com/safe-pill-disposal.html>

20. The pill terminator. <https://www.pillterminator.com/>
21. Rx Destroyer. <https://www.rxdestroyer.com/>