

CADTH RAPID RESPONSE REPORT: REFERENCE LIST

Closed-System Transfer Devices for the Handling of Hazardous Drugs: Clinical Effectiveness, Cost- Effectiveness, and Guidelines

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About CADTH: CADTH is an independent, not-for-profit organization responsible for providing Canada's health care decision-makers with objective evidence to help make informed decisions about the optimal use of drugs, medical devices, diagnostics, and procedures in our health care system.

Research Questions

1. What is the clinical effectiveness of closed-system transfer devices for the handling of hazardous drugs?
2. What is the cost-effectiveness of closed-system transfer devices for the handling of hazardous drugs?
3. What are the evidence-based guidelines regarding the use of closed-system transfer devices for the handling of hazardous drugs?

Key Findings

One randomized controlled trial, three non-randomized studies, one economic evaluation, and one evidence-based guideline were identified regarding the clinical effectiveness or cost-effectiveness of closed-system transfer devices for adults receiving or administering hazardous drugs.

Methods

A limited literature search was conducted on key resources including PubMed, The Cochrane Library, University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. No filters were applied to limit the retrieval by study type. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2015 and August 3, 2017. Internet links were provided, where available.

Selection Criteria

One reviewer screened citations and selected studies based on the inclusion criteria presented in Table 1.

Table 1: Selection Criteria

Population	Adults receiving or administering hazardous drugs
Intervention	Closed-system transfer device (CSTD)
Comparator	Q1-2: No comparator; Other CSTDs (including PhaSeal, ChemoClave Genie and Spiros, Texium, OnGuard, and Equashield); Biohazard safety cabinet Q3: No comparator required
Outcomes	Q1: Clinical effectiveness (e.g., drug contamination, safety and harms, etc.) Q2: Cost-effectiveness Q3: Guidelines
Study Designs	Health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies, economic evaluations, evidence-based guidelines

Results

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials, non-randomized studies, economic evaluations, and evidence-based guidelines.

One randomized controlled trial, three non-randomized studies, one economic evaluation, and one evidence-based guideline were identified regarding the clinical effectiveness or cost-effectiveness of closed-system transfer devices for adults receiving or administering hazardous drugs. No relevant health technology assessments, systematic reviews, or meta-analyses were identified.

Additional references of potential interest are provided in the appendix.

Health Technology Assessments

No literature identified.

Systematic Reviews and Meta-Analyses

No literature identified.

Randomized Controlled Trials

1. Simon N, Vasseur M, Pinturaud M, Soichot M, Richeval C, Humbert L, et al. Effectiveness of a closed-system transfer device in reducing surface contamination in a new antineoplastic drug-compounding unit: a prospective, controlled, parallel study. PLoS ONE [Internet]. 2016 [cited 2017 Aug 9];11(7):e0159052. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4938267>
[PubMed: PM27391697](#)

Non-Randomized Studies

2. Garrigue P, Montana M, Ventre C, Savry A, Gauthier-Villano L, Pisano P, et al. Safe cytotoxic drug preparation using closed-system transfer device: technical and practical evaluation of a new device (VialShield/Texium) comparatively to a reference one (PhaSeal). *Int J Pharm Compd*. 2016 Mar;20(2):148-54.
[PubMed: PM27323425](#)
3. González-Haba Peña E, Manrique Rodríguez S, Herranz Alonso AM, Pérez CP, Moreno Gálvez M, Iglesias Peinado I, et al. Comparative study of preparation of hazardous drugs with different closed-system drug transfer devices by means of simulation with fluorescein. *Farm Hosp*. 2016 Nov 1;40(n06):496-503.
[PubMed: PM27894224](#)
4. Vyas N, Turner A, Clark JM, Sewell GJ. Evaluation of a closed-system cytotoxic transfer device in a pharmaceutical isolator. *J Oncol Pharm Pract*. 2016 Feb;22(1):10-9.
[PubMed: PM25073678](#)

Economic Evaluations

5. Chan HK, Lim YM. Cost analysis of using a closed-system transfer device (CSTD) for antineoplastic drug preparation in a Malaysian government-funded hospital. *Asian Pac J Cancer Prev*. 2016 Nov 1;17(11):4951-7.
[PubMed: PM28032722](#)

Guidelines and Recommendations

6. Easty AC, Coakley N, Cheng R, Cividino M, Savage P, Tozer R, et al. Safe handling of cytotoxics: guideline recommendations. *Curr Oncol [Internet]*. 2015 Feb [cited 2017 Aug 9];22(1):e27-e37. Available from:
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4324350>
[PubMed: PM25684994](#)

Appendix — Further Information

Previous CADTH Reports

7. Cleansers or disinfectants for cleaning chemotherapeutic agent residue: clinical effectiveness and guidelines [Internet]. Ottawa: CADTH; 2015 Jul [cited 2017 Aug 9]. (CADTH rapid response report: summary of abstracts). Available from: <https://www.cadth.ca/cleasners-or-disinfectants-cleaning-chemotherapeutic-agent-residue-clinical-effectiveness-and>
8. Closed-system transfer devices for the handling of hazardous drugs: a review of the clinical and cost-effectiveness and guidelines [Internet]. Ottawa: CADTH; 2015 May [cited 2017 Aug 9]. (CADTH rapid response report: summary with critical appraisal). Available from: <https://www.cadth.ca/closed-system-transfer-devices-handling-hazardous-drugs-review-clinical-and-cost-effectiveness-and>
9. Closed-system transfer devices for the handling of hazardous drugs: clinical and cost-effectiveness and guidelines [Internet]. 2015 Mar [cited 2017 Aug 9]. (CADTH rapid response: reference list. Available from: <https://www.cadth.ca/closed-system-transfer-devices-handling-hazardous-drugs-clinical-and-cost-effectiveness-and>

Clinical Practice Guidelines – Uncertain Methodology

10. Safe handling standards manual [Internet]. Vancouver: BC Cancer Agency; 2017 [cited 2017 Aug 9]. Module 1: safe handling of hazardous drugs. Available from: <http://www.bccancer.bc.ca/health-professionals/professional-resources/pharmacy/safe-handling-manual>
See “D.2.14 Closed System Drug Transfer Devices”
11. Safe handling of hazardous drugs [Internet]. Durham (NC): Duke University; 2017 [cited 2017 Aug 9]. Available from: <http://www.safety.duke.edu/sites/default/files/V-HazardousDrugs.pdf>

Review Articles

12. Page MR. Closed-system transfer devices, USP <800>, and the NIOSH Protocol. Pharmacy Times [Internet]. 2017 Jul 14 [cited 2017 Aug 9]. Available from: <http://www.pharmacytimes.com/resource-centers/usp-800/closedsystem-transfer-devices-usp-800-and-the-niosh-protocol>
13. Cost-effective implementation of closed system transfer devices (CSTDs) to comply with USP General Chapter <800> [Internet]. San Clemente (CA): ICU Medical; 2016 [cited 2017 Aug 9]. Available from: http://www.icumed.com/media/605314/M1-1559-USP-800-Implementation-WP-Rev01_Web.pdf
14. Martin LP, De Castro-Acuna IN, Gonzalez-Barcala FJ, Moure Gonzalez JD. Evidence of exposure to cytostatic drugs in healthcare staff: a review of recent literature. Farm Hosp. 2016 Nov 1;40(n06):604-21.
[PubMed: PM27894231](https://pubmed.ncbi.nlm.nih.gov/27894231/)

15. Berdi F, Powell MF, Sanz C, Gonzalez R, Massoomi F. Assessing the efficiencies of CSTDs for compounding [Internet]. Pharmacy Purchasing & Products. 2015 Jul [cited 2017 Aug 9]:S4-S10. Available from:
http://forums.pharmacyonesource.com/phos/attachments/phos/pharmacy_ops/3388/2/Massoomi_ppp_1507_hdh_cstds.pdf
16. Beaver CC, Magnan MA. Minimizing staff exposure to antineoplastic agents during intravesical therapy. Clin J Oncol Nurs. 2015 Aug;19(4):393-5.
[PubMed: PM26207702](#)
17. Meade E. Use of closed-system drug transfer devices in the handling and administration of MABs. Br J Nurs. 2015 Sep;24(16 Suppl 1):S21-S27.
[PubMed: PM26946648](#)