

Surface Contamination of Cytotoxic Chemotherapy in Preparation and Patient Care Areas in Australian Hospitals: A Retrospective Cross-Sectional Study

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BACKGROUND

Recommended safe handling procedures are currently in place to minimise the exposure of healthcare professionals to cytotoxic medications. Environmental contamination may unnecessarily expose cytotoxic chemotherapeutic medications to health care professionals during their preparation and administration. Closed-system transfer devices (CSTD) may reduce the risk of environmental exposure experienced by health care professionals.

AIM

The primary aim is to determine the levels of cytotoxic contamination in preparation and administration areas in hospitals that use CSTD compared to those that do not.

METHOD

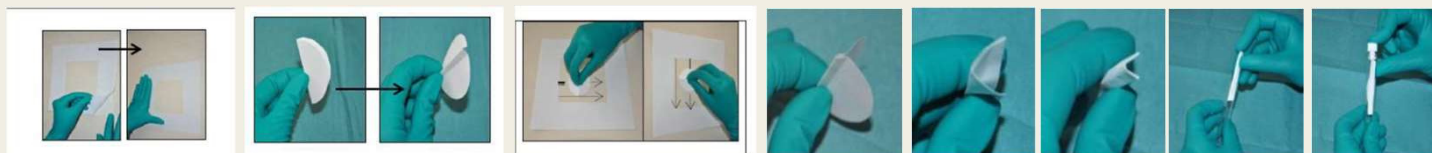
A retrospective cross-sectional study among the four hospitals was conducted. Cytotoxic contamination was determined via surface wipe sampling on six specified surfaces. The samples were tested for ten chemotherapeutic medications: Cyclophosphamide, docetaxel, etoposide, ifosfamide, irinotecan, methotrexate, paclitaxel, pemetrexed, topotecan, vinblastine.

RESULTS

The results of surface wipe sampling indicate environmental contamination with three chemotherapeutic medications at all hospitals regardless of CSTD used. The agent that was most present on the surface wipe samples was ifosfamide 29.2% (7/24) followed by cyclophosphamide 12.5% (3/24) and methotrexate 8.3% (2/24). Hospitals that used CSTDs had less sites with chemotherapy contamination than hospitals that did not use CSTD (25%, 3/12 vs 67%, 8/12). Contamination was more extensive at hospital pharmacies, samples tested positive for cytotoxic medications on the BSC worktop, packaging bench and the floor in front of the BSC.

DISCUSSION

CSTDs appear beneficial in reducing environmental contamination caused by cytotoxic medications during their preparation and administration. However, they do not completely eliminate the risk of exposure. Safe work practices and staff training are encouraged to further minimise exposure risk.



| Sample surfaces | Sites where CSTD is not implemented (n = 2) | | | Sites where CSTD is implemented (n = 2) | | |
|--|---|------------------|--------------|---|------------------|--------------|
| | Ifosfamide | Cyclophosphamide | Methotrexate | Ifosfamide | Cyclophosphamide | Methotrexate |
| Pharmacy Areas | | | | | | |
| BSC surface work area | + | | + | + | | |
| Floor in front of BSC | + | | | | | |
| Bench where finished products are inspected/ packaged | + | + | + | | | |
| Patient administration areas | | | | | | |
| Exterior surface of chemotherapeutic drug container used for transport | | | | | | |
| Counter for priming or validation | | | | | | |
| Armrest of patient treatment chair | + | + | | + | + | |