STUDY SUMMARY

Dirty Little Secrets: Hazardous Drug Contamination at the Chairside

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PURPOSE

The purpose of this clinical study was to assess surface contamination levels at the point of administration in an outpatient oncology center and evaluate the effectiveness of a closed system transfer device (CSTD) for administration to decrease the incidence of surface contamination and accidental exposure to hazardous drugs.

BACKGROUND

The potential health risks associated with exposure to hazardous drugs in the healthcare setting have been well documented for more than 30 years, resulting in increased safety regulatory standards and safe handling recommendations by professional bodies such as the National Institute for Occupational Safety and Health (NIOSH), the American Society of Health-System Pharmacists (ASHP), and the Oncology Nursing Society (ONS). Despite the use of personal protective equipment and safe handling guidelines, healthcare workers continue to show evidence of exposure to hazardous drugs from surface contamination.[1]

The use of CSTDs during hazardous drug preparation has been well documented by the pharmacy community to reduce surface contamination. There is limited documentation on the impact of CSTDs during administration, leading to hesitation to implement these systems at the point of administration due to cost, lack of evidence, and lack of compliance.

The ChemoClave™ system was shown to be effective in eliminating accidental exposure to hazardous drugs and decreasing surface contamination at the point of administration.

MATERIALS AND METHODS

For the study, ChemoGLO™ surface wipe samples were collected at Wake Forest Cancer Center pre-implementation of a CSTD for administration and repeated six, fifteen, and twenty-four months post-implementation of ICU Medical's ChemoClave System. No changes were made to the cleaning procedures during evaluation. Surface wipe samples were taken from the infusion chair arm, chairside table, and adjacent utility cart, and docetaxel and paclitaxel were analyzed by liquid chromatography coupled with tandem mass spectrometry. The lower limits of detection (LLD) assays are 1 ng/ft^2; therefore, concentrations less than the LLD were considered non-detectable.[2]

RESULTS

The pre-study wipe test showed that the side table was contaminated with docetaxel and paclitaxel at levels of 847.4 ng/ft^2 and 1530.9 ng/ft^2, respectively. The wipe tests conducted six months after implementation of the ChemoClave System showed a non detectable amount of docetaxel contamination and a 99.5% reduction in paclitaxel contamination from 1530.9 ng/ft^2 to 7.4 ng/ft^2.

A follow-up wipe study at fifteen months post-implementation showed no contamination on the infusion chair arm, chairside table, or adjacent utility cart for either docetaxel, paclitaxel, and at twenty-four months post-implementation showed no contamination for docetaxel, paclitaxel, 5 fluorouracil (5-FU), or cyclophosphamide (CP). In addition, no incidence of clinician or patient exposure was reported due to inadvertent line disconnects, free flow, or improper connections.

TABLE 1

Summarizes the results for locations evaluated by ChemoGLO wipe study.

	Chair Arm	Chairside Table	Utility Cart
Pre-Implementation of CSTD			
Docetaxel Concentration (ng/ft^2)	ND	847.6	ND
Paclitaxel Concentration (ng/ft^2)	ND	1530.9	ND
6 Months Post-Implementation			
Docetaxel Concentration (ng/ft^2)	ND	ND	ND
Paclitaxel Concentration (ng/ft^2)	ND	7.4	ND
15 Months Post-Implementation			
Docetaxel Concentration (ng/ft^2)	ND	ND	ND
Paclitaxel Concentration (ng/ft^2)	ND	ND	ND
24 Months Post-Implementation			
Docetaxel Concentration (ng/ft^2)	ND	ND	ND
Paclitaxel Concentration (ng/ft^2)	ND	ND	ND
5-FU Concentration (ng/ft^2)	ND	ND	ND
Cyclophosphamide Concentration (ng/ft^2)	ND	ND	ND

ND= Non-detectable

CONCLUSION

ChemoClave was shown to be effective in eliminating accidental exposure to hazardous drugs and decreasing levels of surface contamination at the point of administration. ICU Medical's Spiros® closed male luer, when placed at the end of a syringe or IV tubing, can prevent leakage or accidental discharge during and after administration as the Spiros automatically self seals when disconnected and only opens when attached to a female needlefree connector. The results of this study confirm the ability of the ChemoClave System to reduce surface contamination during the administration of hazardous drugs.

1. Polovich M (ed.). Safe Handling of Hazardous Drugs. Pittsburgh, PA: Oncology Nursing Society, 2011
2. Results of ChemoGLO™ wipe study conducted at Wake Forest Cancer Center –Winston – Salem. 2009, 2010, 2012