

REPORT ON VERIFICATION OF CARCINOGENS USE

CYCLOPHOSPHAMIDE IN CANCER THERAPY CENTRES

Cyclophosphamide use in cancer therapy centres across New South Wales was verified for compliance with Workplace Health and Safety (WHS) Regulations. Surface swab sampling to detect cyclophosphamide and five other cytotoxic drugs was performed at most of these workplaces to evaluate, and where necessary, to improve control measures. Results of field visits conducted by WorkCover's WHS Division as part of its Carcinogens Verification program are reported here.

INTRODUCTION

Cytotoxic drugs are increasingly used in the health care sector around the world to treat cancer patients. Workers who prepare, use or handle cytotoxic drugs and related waste in hospital cancer therapy clinics may be exposed to these hazardous chemicals.

Cyclophosphamide is a cytotoxic drug used regularly to treat cancer patients. It is classified as a known human carcinogen and use in cancer therapy centres is restricted to therapeutic purposes. Users in New South Wales must be authorized by WorkCover under the Work Health and Safety legislation.



Inspectors and technical specialists visited thirty one (31) hospital cancer therapy centres in metropolitan Sydney and regional NSW under the High Consequence Low Frequency (HCLF) Verification program for 2012-13 conducted by WorkCover's WHS Division.

The purpose of the program was to

- (i) verify compliance with requirements for safe use of carcinogens under the WHS Regulations
- (ii) evaluate the effectiveness of workplace control measures to prevent exposure of workers to cyclophosphamide and other cytotoxic drugs and
- (iii) raise awareness on the hazards of cytotoxic drugs and safe work practices among workers along the chain-of-use.

RESULTS

A. Compliance with WHS Regulations

Public and private hospitals had good work practices and safe systems in place to use cytotoxic drugs, demonstrating compliance with most of the requirements in the *WHS Regulation 2011*. Most hospitals had designated WHS personnel and/or regional risk managers who were responsible for ensuring compliance and often participated in our verification visits.

Hazardous chemicals exposure was minimized through specially-designed safe equipment to deliver the drugs in closed systems without spills or leakage and various administrative measures that reduced the frequency and duration of handling the drugs. Suitable personal protective clothing and equipment (PPC and PPE) were used stringently to further prevent exposures. In addition, safe work procedures were in place and nursing staff in particular were well-trained in safe work practices.

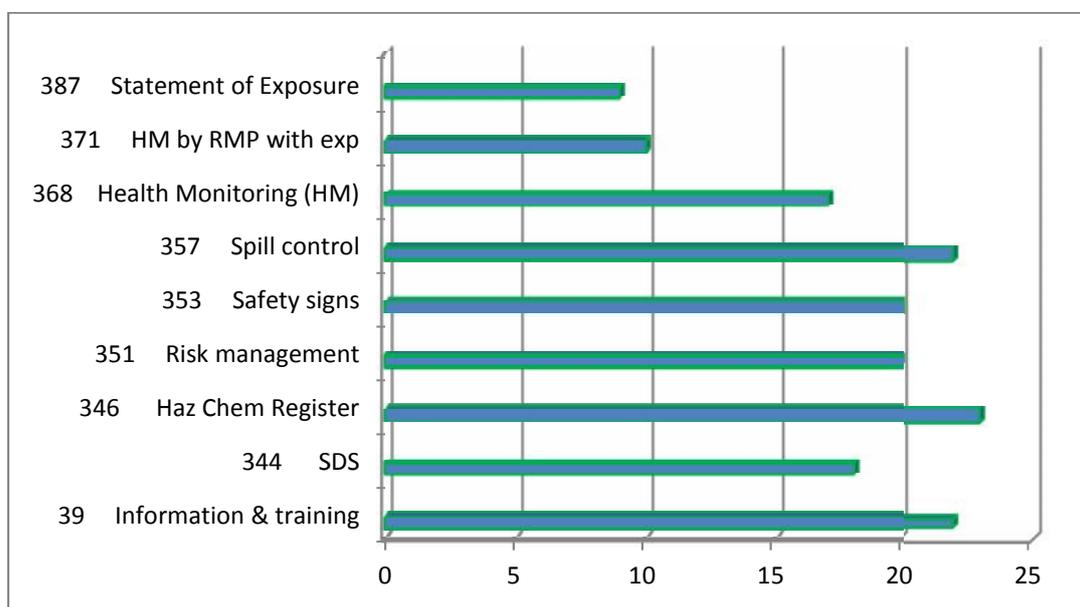


Figure 1: Workplaces complying with WHS Regulation 2011 clauses (numbered) related to carcinogen use

Most workplaces using cyclophosphamide did not comply with an important administrative clause that requires an authorized carcinogen user to provide a statement of exposure to workers on ceasing employment. Action was taken to address this and other non-compliance, including issuing Improvement Notices. Figure 1 shows compliance with the relevant clauses in WHS Regulation.

Safe use of cytotoxic drugs was well managed through risk management practices and the hazardous chemical management programs in the hospitals. Staff working with cytotoxic drugs, particularly oncology nurses were well-trained in safe work procedures, with evidence of ongoing professional development.

However, some staff involved in treatment tasks and waste disposal appeared to lack awareness of the specific health hazards of cytotoxic drugs. We conclude that these workers are not adequately informed on the hazard information that is usually available through safety data sheets (SDS).

Health monitoring of workers was a significant issue that arose throughout the program. Scientific, medical and regulatory factors were considered to determine whether biological monitoring was required for workers who may be at 'significant risk' from exposure to cyclophosphamide and other cytotoxic drugs.

We found that in many cancer treatment centres more than twenty cytotoxic drugs may be used for treatment, including hazardous chemicals other than cyclophosphamide. This is important for national policy making when Safe Work Australia updates the list of prohibited and restricted carcinogens under WHS legislation.

B. Surface contamination with cytotoxic drugs

Sampling for surface contamination with cyclophosphamide was conducted at 21 hospitals where cyclophosphamide or other cytotoxic drugs (CTD) were administered at the time of the verification visit.

A total of 280 swab samples were collected from nine types of locations associated with cyclophosphamide delivery, storage, treatment and waste disposal (see Table 1). Testsafe Australia laboratories analysed the samples to detect cyclophosphamide and five other cytotoxic drugs¹.

Contamination with cyclophosphamide and other CTD were detected in 14 workplaces. Cyclophosphamide above the minimum detectable level of 3 nanograms (ng) was evident in 21 samples (7%) and ranged between 3.45 ng on a treatment chair to 462 ng on a treatment trolley.

Contamination was found on drug holding surfaces such as treatment trolleys but most contamination was evident in toilets that were used by patients treated with cytotoxic drugs. None of the surface samples from used gloves and gowns and from locations associated with cytotoxic drug waste disposal showed any detectable contamination. See Figure 2.

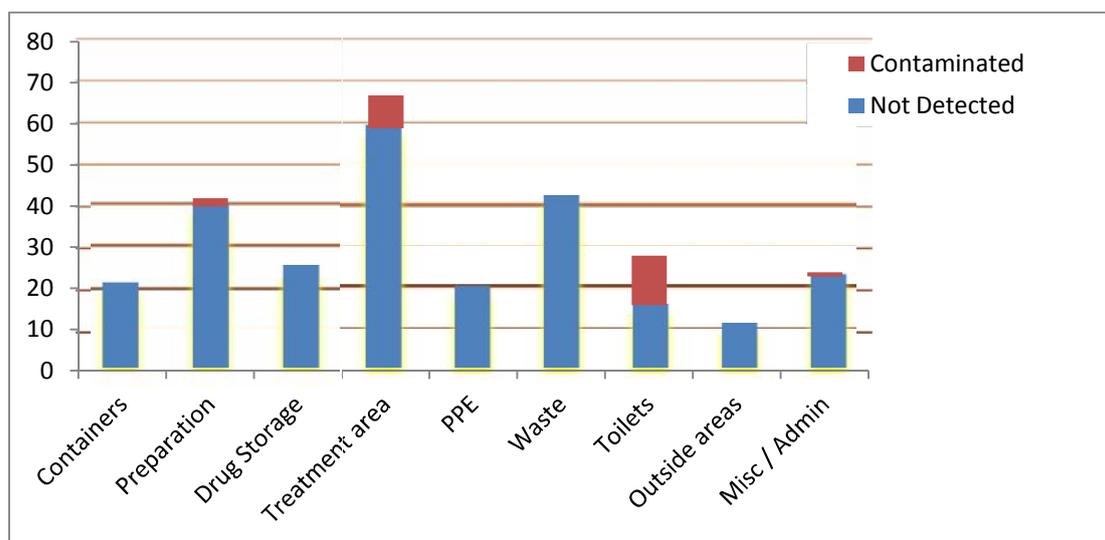


Figure 2: Surface contamination at the nine sampling locations

¹ Methotrexate, Ifosamide, Doxorubicin, Vincristine and Etoposide were the other cytotoxic drugs analysed by TestSafe laboratories.

TABLE 1: Task- or function-based locations for surface sampling

Locations	Type of surface samples	Samples*
Containers	Drug vials, pre-packed drug bags,	0 (21)
Preparations	Preparation items, trays	2 (42)
Drug storage	Refrigerator shelves/handles/floor, shelves	0 (25)
Treatment area	Infusion equipment (pump, metal stand), treatment chairs, floor underneath	8 (67)
PPE	Disposable gloves, gowns and booties; nurse's palm	0 (20)
Waste	Purple bin lid, outer rim; purple bags on trolley; linen bags	0 (42)
Toilets	Seat surface; wash basin, tap handles; door handle; floor	10 (28)
Outside areas	Staff meal room tables; pharmacy counters	0 (11)
Miscellaneous /administration	Nurses' computer keyboard; telephone handset; filing desk	1 (24)

*No of contaminated samples (Total no. of samples)

CONCLUSIONS

The results show that there are good systems in place to work safely with cytotoxic drugs at hospital cancer therapy centres in NSW. The contamination found in some workplaces appear to be residuals due to inadequate cleaning and decontamination in work areas and particularly, from poor hygiene practice in patient toilets.

Overall, we conclude that there is continuous improvement in the health care sector in controlling exposure to cytotoxic drugs, particularly by implementing closed systems for drug delivery. This higher level of hazard control is complemented by the stringent use of personal protective clothing and equipment (PPC and PPE) and the safe work practice components in the training of oncology nurses.

The WorkCover NSW publication *Cytotoxic drugs and related wastes* (2008) was widely used for guidance in the hospitals visited. It appears to have contributed significantly to the safe work procedures based on good occupational hygiene practices that was evident.

NEXT STEPS

WorkCover's 2013-14 *HCLF Verifications: Carcinogens* program will verify the pharmacy clean rooms/laboratories that prepare & supply specially formulated cytotoxic drugs to hospitals.

The HCLF Verifications are priority programs of the Specialist Services Group, WorkCover NSW.