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**ENVIRONMENTAL CONTAMINATION WITH CYTOSTATIC
DRUGS AT THE CHEMOTHERAPY AND PHARMACY
DEPARTMENTS**

**GENESIS CARE
MILTON KEYNES – UNITED KINGDOM**

28 November 2019

Aim of the study

Environmental contamination with docetaxel, 5-fluorouracil, and paclitaxel was measured at the Chemotherapy and Pharmacy departments of Genesis Care hospital in Milton Keynes. Wipe samples were taken from six surfaces.

Materials and methods

28 November 2019, wipe samples were taken under responsibility of Titilayo Alagbe.

Wipe samples were taken from three surfaces at each department. An overview of the surfaces is presented in Table 1. The dimensions of the surfaces were measured and the areas were calculated. The wipe samples were taken with Cyto Wipe Kits from Exposure Control Sweden AB [1].

All samples were stored at 4°C after sampling and at room temperature during transport. Upon arriving at the lab, the samples were stored frozen until sample preparation and analysis.

The wipe samples were prepared for analysis by adding a 0.1% formic acid solution. Total extraction volume was 100 ml. After extraction, a part of the extract was further cleaned up for analysis.

Docetaxel, 5-fluorouracil, and paclitaxel were analysed with LC-MSMS [2].

Results

The results of the analysis of the wipe samples are presented in Table 1. The contamination per cm² is calculated assuming 100% recovery and wipe efficiency. This means that all results are underestimates. Contamination per cm² is presented according to the colour indication related to the Alert and Action levels for environmental contamination in The Netherlands (Table 2) [3]. The detection limit for the analysis of docetaxel, 5-fluorouracil and paclitaxel is 0.2 ng/ml extract.

The results show no contamination with paclitaxel, 5-fluorouracil, and docetaxel on the six surfaces monitored (Table 1).

Table 1: Paclitaxel (PAC), 5-fluorouracil (5FU), and docetaxel (DOC) in wipe samples from the Chemotherapy and the Pharmacy department

Sample Code	Department	Description Surface	Surface Area (cm ²)	Total Volume (ml)	PAC (ng/cm ²)	5FU (ng/cm ²)	DOC (ng/cm ²)
1	Chemotherapy	Blue tray – Treatment room	500	100	ND (<0.04)	ND (<0.04)	ND (<0.04)
2	Chemotherapy	Chemo POD – Keyboard	350	100	ND (<0.06)	ND (<0.06)	ND (<0.06)
3	Chemotherapy	Nurse station – Desk	2000	100	ND (<0.01)	ND (<0.01)	ND (<0.01)
4	Pharmacy	Dispensary computer keyboard	350	100	ND (<0.06)	ND (<0.06)	ND (<0.06)
5	Pharmacy	Dispensary workstation	2000	100	ND (<0.01)	ND (<0.01)	ND (<0.01)
6	Pharmacy	Gloves + Paclitaxel outer bag	300	100	ND (<0.07)	ND (<0.07)	ND (<0.07)

ND: Not Detected

Table 2: Alert and action levels for environmental contamination with cytostatic drugs in The Netherlands [3]

Contamination (ng/cm ²)	< 0.10	0.10 – 1.0	1.0 – 10	> 10
Actions	Repeat annually	Alert level: Perform risk assessment Repeat wipe tests after 3 – 6 months If necessary, take extra precautions		Action level: Take extra measures and check with repeat wipe tests

Discussion, Conclusions and Recommendations

The results show no contamination with paclitaxel, 5-fluorouracil and docetaxel.

Compared to the Alert and Action levels for environmental contamination in The Netherlands (Table 2), the results show now contamination (indicated in green).

No additional measures needed.

References

- 1 www.exposurecontrol.net
- 2 Exposure Control Sweden AB. LC-MSMS methods for the analysis of cytotoxic drugs in air, wipe and urine samples.
- 3 Meetstrategie en werkinstructie veegproeven cytostatica. Werkgroep toetsingswaarden cytostatica. November 2016. www.dokterhoe.nl

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