

Cytotoxic contamination research in a centralised cytotoxic unit to improve professional practices

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Background:

Long term exposure to cytotoxic substances can lead to serious side effects. In reaction to a constant increase in activity in our oncology department, we decided to organize a campaign of surface tests to evaluate the environmental contamination and staff exposure to cytotoxics.

Purpose:

This study's purpose was to measure the contamination in different areas of our preparation unit, corresponding with the different stages of the preparation. We then proposed adapted corrective measures.

Material and methods:

Identification of sensitive areas to be tested

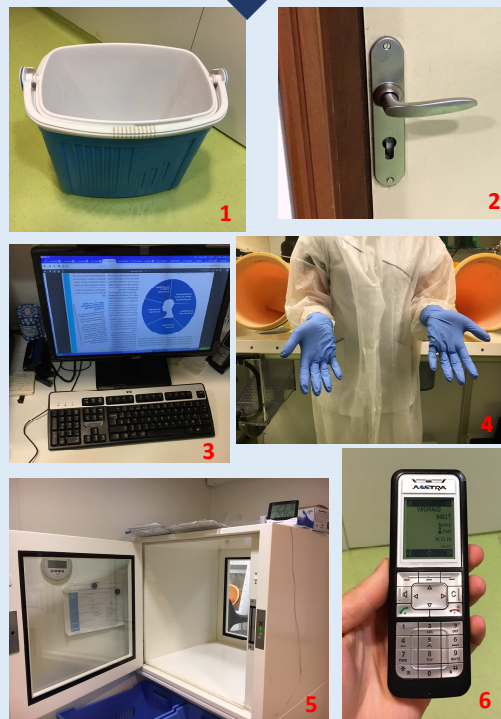
1. the case used to carry the preparations
2. the handle of the preparation unit's door
3. Two keyboards from the desk where the preparations are controlled
4. The Gloves of the technician's helper
5. The transfer airlock
6. The phone

Collection of the samples

Samples were collected by rubbing a sterile compress soaked with 0.1 ml of sterile water for injection onto a surface of 10 cm² of each zone

Quantitative analysis by UPLC - MS / MS

Tested cytotoxics:	Detection limit (ng):
Cytarabine	1
Cyclophosphamide	1
Ganciclovir	1
Gemcitabine	1
Ifosfamide	1
Irinotecan	1
Méthotrexate	1
Dacarbazine	1
Doxorubicin	1
Fluorouracil	10



Results:

None of these molecules were found on the different tested areas, with the exception of **the technician's helper's gloves**, which were contaminated with:

- 462.4 ng of cyclophosphamide
- 180.1 ng of doxorubicin
- 1.8 ng of ifosfamide

To avoid that contamination, **corrective measures were implemented**: cytotoxic drugs preparations are now **labeled and packed directly inside the isolator** and the **outer packaging is made on the way out of the isolator, using a reversible plastic bag**.

Conclusion:

This study revealed a **contamination of the technician's helper's gloves** by cytotoxics. Because the technician's helper is required to pack the preparations, **he may be responsible for a contamination of the whole transportation network** from the pharmacy to the oncology department.

That contamination should be avoided by the corrective measures now in place to **prevent from any contact between the technician's helper's gloves and the preparations**.

The impact of these measures on the environmental contamination will then be evaluated with another campaign of tests.