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WHAT WAS DONE?

Hospital pharmacists of four Austrian hospitals

- Vienna General Hospital
- Innsbruck University Hospital
- Landeskrankenhaus Horn-Allentsteig
- Landeskrankenhaus Zwettl

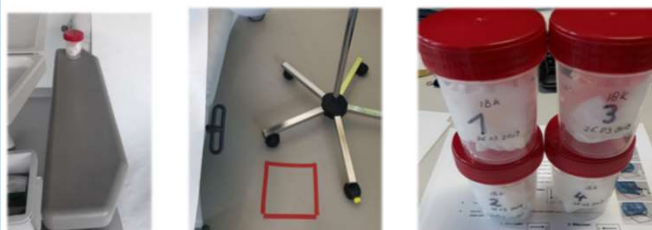
differing in size, logistic requirements and production capacity, equipment (but all using Closed System Devices), and involved staff participated in the MASHA (Research about Environmental Contamination by Cytotoxics and **MA**nagement of **SA**fe **HA**ndling Procedures) project of the European Society of Oncology Pharmacy (ESOP)¹.

WHY WAS IT DONE?

- Several studies show that contamination with cytostatics is found on various work surfaces in hospitals^{2,3}.
- Wipe sampling for surface residue of antineoplastic and other hazardous drugs in healthcare settings is currently the method of choice to determine the workplace's environmental contamination with these drugs⁴.

HOW WAS IT DONE?

- In the first part of the project, surface contamination by cytostatics was investigated using wipe samples.



- Subsequently, training materials were developed and used for uniform training of medical staff involved in administering antineoplastic drugs.
- After the training, a second set of wipe samples of the same surfaces were taken and analysed.

WHAT HAS BEEN ACHIEVED?

- All four hospitals' results in the first series of measurements were below the reference value given in the project of 0,1ng/cm², indicating "low" contamination.

LOW	LOQ < 0.1 ng/cm ²
MEDIUM LOW	> 0.1 ng/cm ² < 1 ng/cm ²
MEDIUM HIGH	> 1 ng/cm ² < 10 ng/cm ²
HIGH	> 10 ng/cm ²

- Only a small number of samples show values between the limit of quantification (LOQ), dependent on the substance and analytical method, and 0,1ng/cm², as shown by the results of Innsbruck University Hospital:

Sample No.:	1	2	3	4
Sample description customer:	top of work benches in the nurses room	floor in the nurse's room	armrest of patients chair	top of cytotoxic waste container
Area:	cm ² 900	900	660	837
Sample description IUTA:	unit M 190328/ 49	M 190328/ 50	M 190328/ 51	M 190328/ 52
5-Fluorouracil	ng/cm ² <0.01	<0.01	<0.02	<0.01
Gemcitabine	ng/cm ² <0.004	<0.004	<0.005	<0.004
Cyclophosphamide	ng/cm ² <0.004	<0.004	<0.005	<0.004
Paclitaxel	ng/cm ² <0.01	<0.01	<0.02	<0.01
Total Platinum	ng/cm ² <0.0002	0.0021	<0.0003	<0.0003

- The same is for the second series of wipe samples after the training, as shown by the results of Landeskrankenhaus Zwettl:

Sample No.:	1	2	3	4
Sample description customer:	top of work benches in the nurses room	floor in the nurse's room	armrest of patients chair	top of cytotoxic waste container
Area:	cm ² 840	900	480	552
Sample description IUTA:	unit M 191022/002	M 191022/003	M 191022/004	M 191022/005
5-Fluorouracil	ng/cm ² <0.01	<0.01	<0.02	<0.02
Gemcitabine	ng/cm ² <0.004	0.034	0.016	<0.006
Cyclophosphamide	ng/cm ² <0.004	<0.004	<0.007	<0.006
Paclitaxel	ng/cm ² <0.01	<0.01	<0.02	<0.02
Total Platinum	ng/cm ² <0.0003	0.067	0.005	0.00083

- Considering that standards, recommendations or trainings by pharmacists or occupational health professionals has already been in place before this project, the impact of further training for the medical staff could not be quantified by measuring the residues.
- However, feedback from trained staff was exclusively positive, and our main objective to demonstrate that occupational exposure with cytostatics is low to non-detectable on our wards was achieved

WHAT NEXT?

We want to encourage more hospitals to get involved in similar projects, and we hope that more powerful analytics will give us more answers for proper handling.

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