

Security in the operation room during chemotherapy

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**The management of Hyperthermic intraperitoneal
Chemotherapy (HIPEC) after Cytoreductive Surgery
3.-5.3.2011 Hamburg**

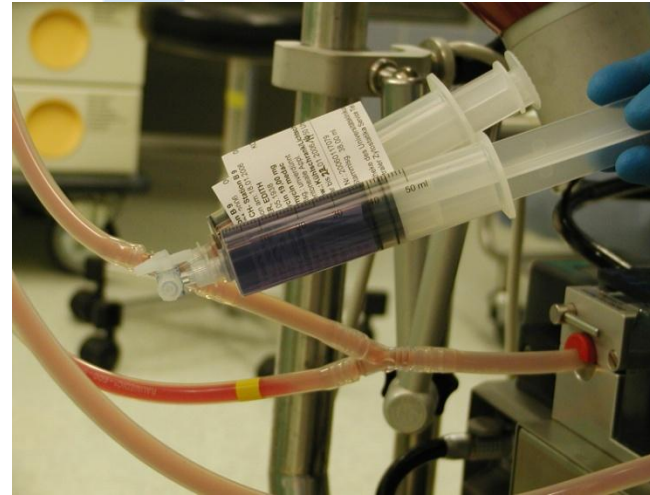


There is one questions from the healthcare workers involved in HIPEC:

Is HIPEC a safe procedure ?



Environmental problems in HIPEC



Mode of administration

Duration of exposure during procedure

Use of hyperthermia (aerosol ?)

Direct contact with cytotoxic agents

Accidents (e.g. disconnection of tubes)



Literature

Safety considerations:

White	1996	AORN J.
Jähne	1997	Lang. Arch. Surg.
González-Bayón	2006	EJSO

Safety monitoring:

Stuart	2002	Ann. Surg. Oncol.	(MMC)
Schmid	2006	EJSO	(MMC)
Näslund-Andreasson	2010	J. Oncol.	(Oxaliplatin)





ELSEVIER

Available online at www.sciencedirect.com



EJSO

the Journal of Cancer Surgery

www.ejso.com

EJSO 32 (2006) 1222–1225

Investigations on safety of hyperthermic intraoperative intraperitoneal chemotherapy (HIPEC) with Mitomycin C

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Accepted 10 May 2006
Available online 19 June 2006

- Air contamination in OR ?
- Exposure of operating room personnel ?



Subjects

Analysis of plasma samples of surgeons
before and after performing HIPEC

Air samples in the OR close to the operation
field during HIPEC

In vitro penetration experiments (gloves)



Plasma samples

- Measurement with HPLC-UV method
- Limit of detection ($1 \mu\text{g MMC/L plasma}$)

Results:

→ No drug detection in the plasma of the surgeons

→ Mean value of MMC in the samples of the patients (post HIPEC) = $361 \mu\text{g/L}$



Air samples

- Measurement with PAH (polycyclic aromatic hydrocarbon) method
- Limit of detection (10.3 MMC ng/m³ air)

Results:

→ No drug detection in the air samples



In vitro penetration tests

- Franz diffusion cell
- Forty diffusion cell tests
 - in-use workplace exposure: 1.6 μg MMC
 - worst case exposure: 160 μg MMC

Results:

→ Only one breakthrough in the worst case scenario



Cave !

- MMC is an old drug !
- detection by HPLC UV method
Limit of detection (1 μg MMC/L plasma)



Is Platinum Present in Blood and Urine from Treatment Givers during Hyperthermic Intraperitoneal Chemotherapy?

Sara Näslund Andréasson, Helena Anundi, Sig-Britt Thorén, Hans Ehrsson, and Haile Mahteme

J Oncol. 2010; 2010: 649719.

- Using of Oxaliplatin
- Detection by mass spectrometry
(Detection limit for Pt in blood was 0.05 nmol/L)



Detection of Oxaliplatin

The blood samples were all below the detection limit of <0.05 nmol/L, and the urine samples were all below the detection limit of <0.01 $\mu\text{g/L}$.

Sara Näslund Andréasson, et al.
J Oncol. 2010; 2010: 649719.



Yes, HIPEC is a safe procedure !

How to perform a safe procedure?

What must i do
before
i perform my first HIPEC ?



Instructions concerning handling and risk of cytostatic drugs during surgery



Interdisciplinary teaching module

Teaching

- Nurses
- Surgeons
- Anesthetist

Informing

- Pharmacy
- Quality management
- Works doctor



Behavior rules (general)

- Preparing chemotherapy solution in Pharmacy on call
- Education and instruction of OR personnel (confirmed by signature)
- Notice of safety measures
- Labeling of operating room entrance: "Attention: cytostatics in use!"



Behavior rules (general)

- Exclude pregnant females
- Instructions concerning handling of cytostatic drugs during surgery
- Restriction of personnel inside the operating room
- Regular health checks (e.g. every 6-12 months)



Guidelines (during procedure)

- Double latex gloves during perfusion
- Changing outer gloves every 30 min.
- Smoke evacuator
- Filtration mask
- Eye protection



Guidelines (during procedure)



Guidelines (during procedure)



Guidelines (during procedure)



Guidelines (after HIPEC)

Informations for cleaning personnel

Rigid containers labeled with „cytotoxic agent“

Instructions in the event of contamination

Informations for staff on the ward:

Gloves for 24-48 hours

Disposal of potentially contaminated waste



HIPEC

Safe technique for patients
and healthcare workers
if we have guidelines

