

# The Hype about Hyperthermic Intraperitoneal Chemotherapy



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## Introduction

Cytoreductive surgery and Hyperthermic intraperitoneal chemotherapy (HIPEC) has become the new standard of care for the management of peritoneal surface malignancy. HIPEC is a heated chemotherapy treatment that is delivered to the abdomen during surgery. It is considered topical chemotherapy as it is absorbed to a depth of 2.5mm. It has minimal vascular absorption hence reducing systemic toxicity and increased tissue penetration coupled with enhanced cytotoxic effects.

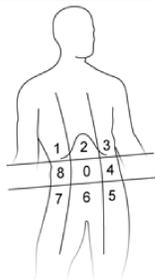


Figure 1: Image of gastrointestinal system

## Prognostic Scores

### 1. Peritoneal Cancer Index (PCI)

- The PCI is an index determining the extent of peritoneal disease. The PCI is calculated by adding up all 13 region scores.



**Regions**  
0 Central  
1 Right upper  
2 Epigastrium  
3 Left upper  
4 Left flank  
5 Lower left  
6 Pelvis  
7 Right lower  
8 Right flank  
9 Upper jejunum  
10 Lower jejunum  
11 Upper ileum  
12 Lower ileum

**Lesion size (LS)**  
LS0 No tumor seen  
LS1 Tumor ≤0.5 cm  
LS2 Tumor ≤5.0 cm  
LS3 Tumor >5.0 cm or confluence

Figure 2: Peritoneal Cancer Index (PCI)

### 2. Completeness of Cyto-reduction Score (CCR)

- CC-0** = Complete Cyto-reduction were all macroscopic tumour removed
- CC-1** = residual nodules were <2.5mm
- CC2-3** = not possible to remove all macroscopic tumour.

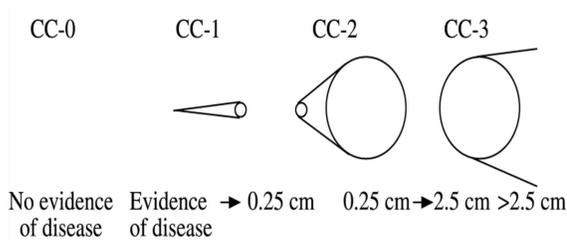


Figure 3: Completeness of Cyto-reduction Score (CCR)

## Heated Intraperitoneal Chemotherapy

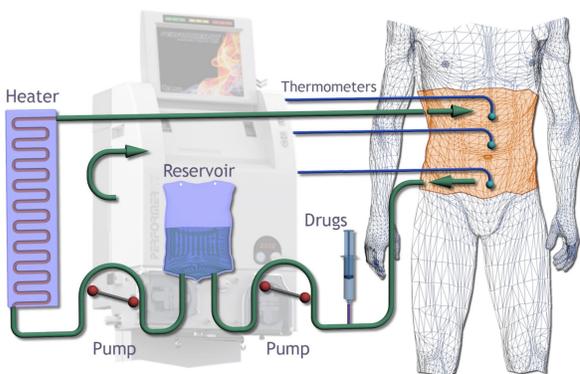


Figure 4: Intraoperative hyperthermic intraperitoneal chemotherapy during peritonectomy surgery

- Causes microvessel embolisation and induces ischemic necrosis in tumor tissue;
- Directly kills cancer cells in the S and M phase of the cell cycle by disturbing cell homeostasis, energy metabolism, activating lysosomes, destroying the cytoplasm and nucleus.
- Disrupts cell membrane proteins and interferes with synthesis of DNA, RNA and proteins.

## Aim

To assess pharmacist interventions in the perioperative period for patients undergoing CRS & HIPEC for the treatment of peritoneal surface malignancy.

## Methods

This study was a prospective audit of all patients that underwent CRS & HIPEC between May 2017 and May 2018. Pre-operatively, patients were reviewed by the Peritonectomy team comprising: surgeons, oncologists, pharmacist, dietician and physiotherapist. The pharmacist documented the medication history and reviewed medications peri-operatively during transitions between the intensive care unit and the ward. Pharmacist interventions were recorded using an online database.

## Results

Sixty patients underwent CRS & HIPEC during the study period. The average length of hospital stay is 17.56 days (4.81%) and the maximum length of stay is 101 days (27.67%). The maximum number of days patient spent in intensive care unit (ICU) was 15 days (4.10%) with an average length if ICU stay of 3.4 days (0.93%). The maximum length of stay on the surgical ward is 46 days with an average length of stay of 8 days. Seventy-one pharmacist-initiated interventions reported (mean=1.2 interventions per patient).

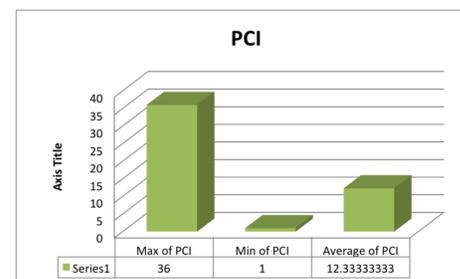


Figure 5: Peritoneal Cancer Index (PCI)

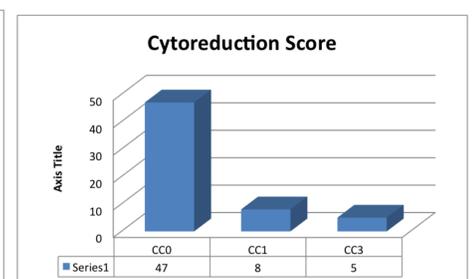


Figure 6: Completeness of Cyto-reduction

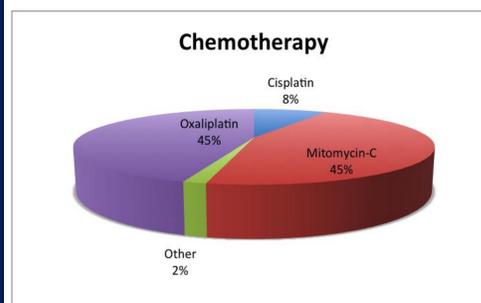


Figure 7: HIPEC

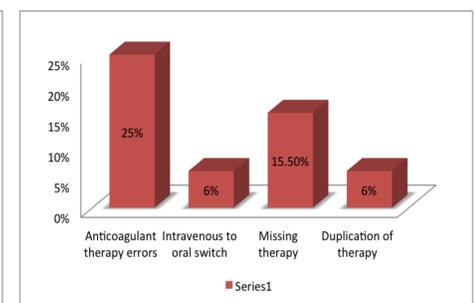


Figure 8: Pharmacist Intervention themes

## Pharmacist Interventions

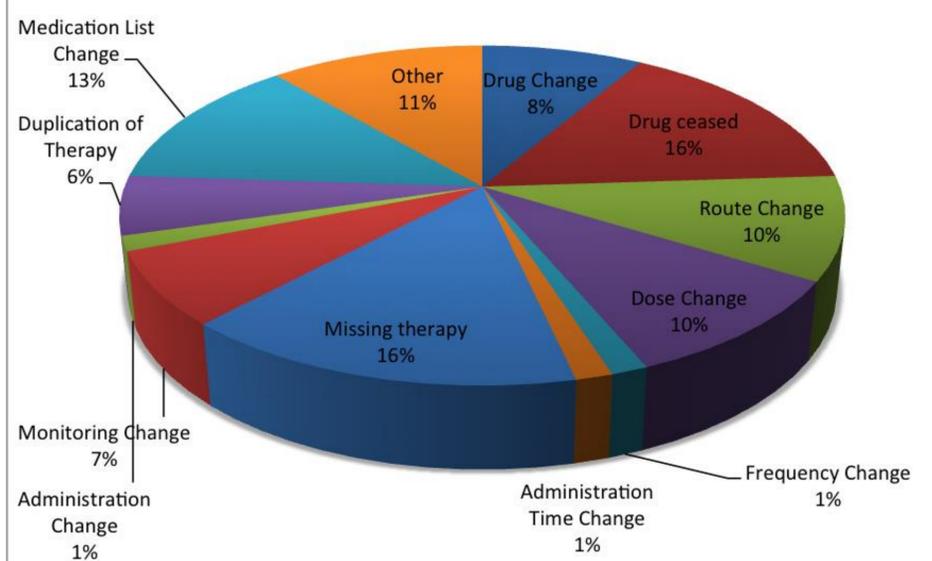


Figure 9: Pharmacist Interventions

The pharmacist is also involved in obtaining the best possible medication history pre-operatively, splenectomy vaccinations and antibiotic regimens are adhered to, deep vein thrombosis prophylaxis, discharge medication reconciliation planning and medication counselling.

## Conclusion

The pharmacist plays a vital role on the interdisciplinary CRS & HIPEC team, formulating HIPEC protocols, preventing errors of omission, therapeutic duplication, admission and discharge medication reconciliation optimising a safe transition of patient care. However, as the demand on CRS and HIPEC continues to develop so too will the role of the pharmacist evolve.

## References

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