

# Implementation of a Standardized HIPEC Protocol Improves Outcome for Peritoneal Malignancy

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## Abstract

**Background** Experience with Cytoreductive Surgery (CRS) and Hyperthermic Intraperitoneal Chemotherapy (HIPEC) in a pioneer hospital resulted in a treatment protocol that has become the standard in the Netherlands. Outcome of CRS and HIPEC was reviewed to assure differences between the pioneer phase and the period wherein the Dutch HIPEC protocol was clinically implemented.

**Methods** The first consecutive 100 CRS and HIPEC procedures performed in the Netherlands were included as pioneer cohort (1995–1999). Two-hundred and seventy-two procedures that were performed in three participating HIPEC centres after the implementation of the Dutch HIPEC protocol were included as the implementation cohort (2005–2012). Another 100 recent patients of the first centre were included as a control group (2009–2011). Indications for the CRS and HIPEC treatment were peritoneal carcinomatosis (PC) from colorectal carcinoma and pseudomyxoma peritonei (PMP).

**Results** Of the 472 included procedures, 327 (69 %) procedures were performed for PC from colorectal carcinoma and 145 for PMP (31 %). Compared with the implementation phase, the pioneer phase was characterized by more affected abdominal regions (mean 4.3 vs. 3.5,  $p < 0.001$ ), more resections (mean 3.8 vs. 3.4,  $p < 0.001$ ), less macroscopic radical cytoreductions (66 vs. 86 %,  $p < 0.001$ ) and more patients with major morbidity (grade III–V) (64 vs. 32 %,  $p < 0.001$ ). Other determinants of morbidity were high tumour load and multiple organ resections. Outcome of the implementation phase was similar to the control group.

**Conclusions** This study determined that outcome had improved ever since the Dutch HIPEC protocol has been implemented based on completeness of cytoreduction and decreasing morbidity.

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