Cytoreductive Surgery (CS)/Hyperthermic Intraperitoneal Chemoperfusion (HIPEC) offers:

- One-time regional therapy for patients with advanced abdominal cancers
- Chance for a positive outcome in terms of survival and quality of life
- Potentially curative option, even for patients with significant tumor burden

Advanced regional cancer treatments combine leading-edge surgical and chemotherapeutic techniques to maximize treatment response while minimizing toxicity and side effects.
Our CS/HIPEC approach improved overall survival as much as 45 percent in select patients with peritoneal malignancies or metastases.

**CS/HIPEC for Advanced Abdominal Disease**

Peritoneal carcinomatosis (PC) affects approximately 10% to 30% of patients with colorectal cancer and represents a challenging treatment issue for these patients. Response to modern oxaliplatin- and irinotecan-based systemic chemotherapy remains disappointing and median overall survival for colorectal PC is 12.7 months with a 5-year overall survival of ≤ 4% (Franko, et al. JCO 2011).

A complex procedure, CS/HIPEC can be done safely and offers many patients an effective therapeutic option.

### CONDITIONS WE TREAT

<table>
<thead>
<tr>
<th>CS/HIPEC may benefit patients with:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Colorectal peritoneal carcinomatosis</td>
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<tr>
<td>• Appendiceal neoplasms/carcinomatosis</td>
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<tr>
<td>• Disseminated peritoneal adenomucinosis (DPAM) - (Historical treatment has been surgical debulking alone; however, the addition of HIPEC can prevent or delay the mucin recurrence, leading to fewer lifetime surgeries for the patient)</td>
</tr>
<tr>
<td>• Primary peritoneal mesothelioma</td>
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<tr>
<td>• Gastric cancer carcinomatosis</td>
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<tr>
<td>• Primary peritoneal carcinoma</td>
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<tr>
<td>• Refractory ovarian cancer</td>
</tr>
<tr>
<td>• Sarcomatosis</td>
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<tr>
<td>• Peritoneal tumors that have failed standard chemotherapy and/or prior surgery</td>
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</tbody>
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### HOW CS/HIPEC WORKS

After meticulous cytoreductive surgery to debulk the tumor(s), the peritoneal cavity is bathed with heated, high-dose chemotherapy. The procedure entails:

- Removal of gross tumor through a combination of visceral resection and selective peritonectomies only for involved surfaces (no "peritoneal stripping")
- Chemotherapy dosing at 3 to 4 times the maximum tolerated dose for systemic therapy (taking advantage of the plasma/peritoneal barrier)
- Mitotycin C is used most commonly
- Hyperthermia—42°C for 90 minutes—increases drug uptake by tumor cells and may be directly tumoricidal
- At procedure’s end, all chemotherapy is removed
- Duration of hospital stay averages 10 to 14 days

### Could Regional Treatment Benefit Your Patient?

**BENEFITS OF CS/HIPEC**

1. Direct access to the tumor
2. Minimizes tumor burden
3. Maximizes chemotherapy dose (taking advantage of the plasma/peritoneal barrier)
4. Achieves true fever range hyperthermia to increase response rates
5. Does not preclude other therapies such as systemic chemotherapy

**LIMITATIONS**

1. Addresses peritoneal disease only (some patients may still require systemic therapy for distant disease)
2. Requires surgical procedure with associated potential morbidity

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As a one-time treatment, CS/HIPEC may be an important part of a patient’s optimal treatment. The limited postoperative hospital stay makes it logistically feasible even for patients who live several hours from the Buffalo, NY area.

—John Kane, III, MD Chief, Sarcoma/Melanoma Service
What Sets Us Apart

As a multidisciplinary comprehensive cancer center, we call upon highly-skilled professionals from all areas of cancer care, dedicated to treating the whole patient, not just their cancer. We work as a team along with the patient’s primary physician or community-based oncologist to provide optimal care delivered with compassion and respect.

Key aspects of RPCI’s Advanced Regional Therapy Program include:

- We are the state’s only CS/HIPEC program outside of New York City
- RPCI is the preferred provider for Canada’s Ontario Ministry of Health
- We offer other advanced regional therapies such as Isolated Limb Infusion (ILI) and Isolated Limb Perfusion (ILP) procedures
- We have 3 board-certified, fellowship-trained surgical oncologists with cumulative experience of more than 16 years performing CS/HIPEC
- Since 2002, we’ve treated hundreds of patients with CS/HIPEC
- As part of a multi-center study, funded in part by the National Cancer Institute, our experts reported on the impressive outcomes with CS/HIPEC. Study results were published in *Cancer Medicine* (see below)

### Published Outcomes

We recently reviewed 112 consecutive CS/HIPEC patients receiving treatment at our center. The most common histologies were colorectal cancer (33.9%), DPAM (24.1%), appendiceal adenocarcinoma (21.4%), and mesothelioma (9.8%). Prior systemic chemotherapy had been administered in 45.5%.

- 90% of patients were discharged by postoperative day 14
- 30-day postoperative mortality was 0%
- At a median follow-up of 25 months:

<table>
<thead>
<tr>
<th>Histology</th>
<th>Median survival</th>
<th>5-year overall survival</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorectal cancer</td>
<td>45.2 months</td>
<td>38.2%</td>
</tr>
<tr>
<td>Appendiceal adenocarcinoma</td>
<td>39.9 months</td>
<td>38.7%</td>
</tr>
<tr>
<td>DPAM</td>
<td>Not reached</td>
<td>91.3%</td>
</tr>
<tr>
<td>Peritoneal mesothelioma</td>
<td>68.5 months</td>
<td>80.8%</td>
</tr>
</tbody>
</table>


“A review of our data in patients treated with CS/HIPEC over the last decade found a statistically significant benefit in terms of survival, with low morbidity and low mortality.”

—Joseph J. Skitzki, MD, surgical oncologist at RPCI

### Staging Smarts

Because CT and PET typically underestimate the extent of carcinomatosis, as many as 7% to 10% of patients are not able to proceed with CS/HIPEC at time of exploration. A staging diagnostic laparoscopy may determine disease extent more accurately.

### A Candidate for CS/HIPEC?

**Prerequisites for this procedure include:**

- **✓** Appropriate health/performance status with minimal comorbid conditions to tolerate potentially lengthy surgery and significant postoperative fluid shifts.
- **✓** Tumor is limited to peritoneal surfaces (no visceral or extraperitoneal metastases). Contraindications include presence of hepatic or pulmonary metastases, malignant pleural effusion, or anterior diaphragmatic/mediastinal nodal metastatic disease.
- **✓** Realistic ability to completely remove peritoneal tumor. Achieving complete or near complete cytoreduction is strongest predictor of response to CS/HIPEC.

For some patients who meet the first two criteria but extent of PC is “borderline,” upfront systemic chemotherapy may potentially downstage extent of peritoneal disease. Although most intra-abdominal organs can be resected acceptably (colorectum, spleen, gynecologic organs) tumor involvement of the porta hepatis or large portions of small bowel would be prohibitive.
Meet our CS/HIPEC experts

John Kane, III, MD, FACS
Chief, Sarcoma/Melanoma Service
Surgical Oncology

Joseph J. Skitzki, MD, FACS
Surgical Oncology

Valerie Francescutti, MD, FRCSC
Surgical Oncology

To speak with one of our CS/HIPEC experts, call 716-845-3284.

Refer a Patient
Please contact our referral specialist:

Jennifer Sikorski
Patient Access
Phone: 716-845-4614
Fax: 716-845-3438

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