Understanding Peritoneal Cancer

A guide for patients and families

Written by Dr. Pablo Lozano Lominchar

Surgical oncologist · Hospital General Universitario Gregorio Marañón, Madrid

---

> This guide is written for you and for the people beside you. No prior knowledge is needed. Read it at your own pace and take it to your appointment with your questions noted down.

What Is Peritoneal Cancer?

The Peritoneum: Your Abdomen's Protective Lining

The peritoneum is a thin, transparent membrane — similar in thickness to a sheet of cling film — that lines the inside of your abdomen and wraps around most of your abdominal organs: the stomach, liver, intestines, spleen, and uterus or ovaries in women. This membrane has two layers that glide against each other, lubricated by a small amount of fluid, allowing your organs to move smoothly as you breathe and digest food.

Under normal circumstances, the peritoneum is remarkably unremarkable — it does its job silently and invisibly. When cancer reaches it, however, it becomes the central challenge of treatment.

How Does Cancer Reach the Peritoneum?

Peritoneal cancer — or peritoneal carcinomatosis — occurs when malignant cells implant themselves on the surface of the peritoneum and begin to grow. This can happen in two main ways:

- **Direct spread** from a nearby tumour: a colon cancer, for example, can grow through the intestinal wall and shed cells onto the peritoneal surface.
- **Transperitoneal dissemination**: during surgery on a tumour, or spontaneously, cancer cells can "float" through the abdominal fluid and settle on distant peritoneal surfaces.

The most common sources of peritoneal carcinomatosis are colorectal cancer, ovarian cancer, appendiceal tumours (including a condition called pseudomyxoma peritonei), gastric cancer, and mesothelioma. Each has a different biological behaviour and prognosis.

Is This the Same as Metastatic Cancer?

This is one of the most important questions — and the answer is nuanced. Peritoneal carcinomatosis is technically a form of metastatic disease, but it behaves differently from blood-borne metastases to the liver, lung, or brain. Because the disease remains confined to the peritoneal surface — rather than spreading through the bloodstream to distant organs — it may still be amenable to surgical treatment in carefully selected patients.

This distinction has led to the development of a specialised surgical approach — cytoreductive surgery (CRS) combined with hyperthermic intraperitoneal chemotherapy (HIPEC) — that can achieve long-term survival, and in some cases cure, in patients with limited peritoneal disease from certain tumour types.

📌 KEY POINT

Peritoneal carcinomatosis is not automatically a terminal diagnosis. In selected patients — particularly those with appendiceal or colorectal origin and limited disease extent — CRS+HIPEC can achieve median survivals of 3–7 years, with some patients cured.

Symptoms: Why It Is Often Detected Late

The peritoneum has no pain nerve fibres equivalent to those in the skin or gut wall, which means that peritoneal tumours can grow for months without causing significant symptoms. When symptoms do appear, they tend to be non-specific:

- Gradual abdominal swelling or bloating (due to fluid accumulation — ascites)
- Vague abdominal discomfort or a feeling of fullness

- Changes in bowel habits — constipation or looser stools
- Unexplained weight loss
- Fatigue
- Nausea or decreased appetite

These symptoms are often attributed to benign causes — irritable bowel syndrome, dietary issues — before the correct diagnosis is made. If you have a known history of colorectal, ovarian, or appendiceal cancer and develop any of these symptoms, report them to your oncology team promptly.

How Is Peritoneal Cancer Diagnosed?

Imaging Studies

The primary imaging tool for peritoneal carcinomatosis is **contrast-enhanced computed tomography (CT)** of the chest, abdomen, and pelvis. CT provides a three-dimensional map of the disease, identifying the number, size, and distribution of peritoneal deposits, any involvement of adjacent organs, and the presence of ascites. However, CT has limitations: it underestimates the extent of peritoneal disease in up to 30% of cases, particularly for deposits smaller than 1 cm.

MRI (Magnetic Resonance Imaging) with diffusion-weighted sequences is increasingly used as a complementary tool, especially for deposits on the small bowel surface. **PET-CT** (Positron Emission Tomography combined with CT) is useful in certain tumour types to identify occult distant metastases that would make surgery inappropriate.

The Peritoneal Cancer Index (PCI)

The most important staging tool for peritoneal carcinomatosis is the **Peritoneal Cancer Index (PCI)**. This scoring system divides the abdomen into 13 regions — nine divisions of the abdominal cavity plus four segments of the small bowel — and assigns a lesion size score (0 to 3) to each region, based on the largest tumour deposit found there. The maximum possible PCI score is 39.

PCI Score	Disease Extent	Typical Surgical Strategy
0–10	Limited	CRS+HIPEC: high probability of CC-0 resection
11–20	Moderate	CRS+HIPEC: possible in experienced centres; careful patient selection
21–30	Extensive	Surgery rarely beneficial; systemic chemotherapy preferred
> 30	Diffuse	Systemic therapy; palliative intent

The PCI is estimated preoperatively on CT/MRI but is definitively established only during surgery, when the entire peritoneal surface can be inspected directly. This means that a patient planned for CRS+HIPEC based on imaging findings may be found at surgery to have a higher PCI than expected — a critical discovery that the surgeon must communicate clearly.

Diagnostic Laparoscopy

In some cases, before committing to a major open surgery, your team may recommend a **diagnostic laparoscopy**: a minimally invasive procedure using a camera inserted through small incisions in the abdomen, allowing direct visualisation of the peritoneal surface. This allows a precise PCI assessment, targeted biopsies, and — importantly — avoidance of unnecessary open surgery in patients found to have unresectable disease.

🎯 CLINICAL PEARL

Ask your surgical team whether a diagnostic laparoscopy has been considered before planning open CRS+HIPEC. In patients where imaging suggests a PCI close to the resectability threshold, a laparoscopy can avoid a non-therapeutic laparotomy in up to 25% of cases.

Treatment: Cytoreductive Surgery and HIPEC

The Rationale: Why Surgery and Chemotherapy Together?

Peritoneal carcinomatosis creates a biological barrier to systemic chemotherapy: the peritoneal-plasma barrier dramatically limits the penetration of intravenous drugs into the peritoneal surface. In practical terms, this means that the drugs circulating in your blood have very limited access to the tumour deposits on the peritoneum. This is why systemic chemotherapy alone has historically produced poor results in peritoneal disease.

CRS+HIPEC overcomes this by combining two complementary strategies: surgical removal of all visible disease (CRS), and direct application of chemotherapy at high concentration to the peritoneal surface immediately afterwards (HIPEC), with the added benefit of heat to potentiate the drug's anti-tumour effect.

Cytoreductive Surgery (CRS): What We Remove

The goal of CRS is to achieve a **CC-0** resection: no visible residual tumour at the end of the operation. This may require removing:

- Sheets of peritoneum from the abdominal wall, diaphragm, or pelvis (peritonectomy)
- The greater omentum (the fatty apron covering the intestines)
- Segments of the colon, rectum, or small bowel
- The appendix (if not already removed)
- The spleen, gallbladder, or portions of the liver surface
- In women: the uterus, ovaries, and fallopian tubes (if involved)

The extent of the resection depends entirely on where the tumour deposits are located. Not all patients require all these resections. The surgeon's goal is to remove every visible deposit, not to remove organs that are not involved.

HIPEC: The Heated Chemotherapy Step

Once all visible disease has been removed, the surgeon will irrigate the abdominal cavity with a solution of chemotherapy agent (most commonly oxaliplatin or mitomycin C, depending on the tumour type and institutional protocol) heated to 41–43°C. This heated solution circulates

through the abdomen for 60–90 minutes using a perfusion circuit — similar to a heart-lung bypass machine, but for the abdomen.

The heat serves three purposes: it potentiates the anti-tumour effect of the drug, it impairs the ability of cancer cells to repair DNA damage, and it improves drug penetration into the peritoneal tissue. At the same time, because the drug stays largely confined to the abdomen, systemic toxicity (the side effects of conventional chemotherapy) is significantly reduced.

🔑 KEY EVIDENCE

The PRODIGE 7 trial (Quénet, Lancet Oncology 2021) was the first randomised trial of CRS+HIPEC vs CRS alone in colorectal peritoneal metastases. Median overall survival was 41.7 months with CRS+HIPEC vs 41.2 months with CRS alone — a neutral result. However, this trial used oxaliplatin HIPEC, and subsequent analyses suggest that patient selection and HIPEC agent choice may explain the difference with earlier positive studies. At experienced centres, CRS alone or with HIPEC remains a valid strategy for selected patients with PCI ≤ 17.

How Long Does the Operation Take?

CRS+HIPEC is one of the most extensive procedures in abdominal surgery. Depending on the extent of the peritoneal disease and the number of resections required, the operation typically takes **6 to 10 hours**. You will be under general anaesthesia for the entire duration.

What Happens After the Operation?

After CRS+HIPEC, virtually all patients spend the first 1–2 days in the Intensive Care Unit or High Dependency Unit for close monitoring of their cardiovascular, respiratory, and renal function. This is a routine precaution, not a sign that something has gone wrong.

The typical hospital stay is **10 to 14 days**. You will have a urinary catheter, one or more abdominal drains, and an intravenous line. Pain will be managed with an epidural catheter or a patient-controlled analgesia (PCA) pump. You will be encouraged to sit up and walk with assistance as early as day 2 or 3.

⚠️ CALL YOUR TEAM IF YOU EXPERIENCE:

- Fever above 38°C after discharge

- Progressive abdominal swelling or pain
- Wound redness, warmth, or discharge
- Vomiting that prevents eating or drinking
- No bowel movements for more than 5 days after discharge
- Shortness of breath or chest pain
- Swollen, painful leg (possible deep vein thrombosis)

Recovery and Follow-Up

Going Home

You will be discharged when you can eat a normal diet, your pain is controlled with oral medications, you are independently mobile, and there are no signs of complication. For most patients after CRS+HIPEC, this is between day 10 and day 14. Some patients go home sooner; others need more time. Do not feel pressured by these averages — your discharge depends on your individual recovery.

The First Month at Home

Activity: Walk every day — start with short distances and gradually increase. Avoid lifting anything heavier than 5 kg for at least 6 weeks. Do not drive for 4–6 weeks. Avoid strenuous exercise (swimming, running, cycling) until cleared by your surgeon, typically at 6–8 weeks.

Diet: Eat small, frequent meals initially. Prioritise protein-rich foods (meat, fish, eggs, legumes, dairy) to support healing. Avoid very fatty, spicy, or gas-producing foods until your bowel function has normalised. Drink at least 1.5 litres of water daily. If you were given a stoma, your stoma nurse will have provided specific dietary guidance.

Fatigue: Profound tiredness is normal after a major operation and is expected for 6–12 weeks. This is a physiological response — your body is using enormous energy resources for healing. Rest when you need to, but avoid complete bed rest during the day as it will slow your recovery.

Follow-Up Surveillance

After CRS+HIPEC for colorectal peritoneal metastases, the standard follow-up involves:

- CT scan of chest, abdomen, and pelvis every 3–4 months for the first 2 years
- Tumour markers (CEA, CA 19-9) at each visit
- CT every 6 months from year 2 to year 5
- Annual review thereafter

Follow-up is not merely a formality: early detection of recurrence, when it is still limited and potentially resectable, can open the door to further treatment. Attend all your scheduled appointments.

Frequently Asked Questions

Will I need chemotherapy after the operation?
In most cases of colorectal peritoneal metastases, systemic chemotherapy is recommended after CRS+HIPEC. Your medical oncologist will discuss the specific regimen with you once the pathology results are available.

Can the cancer come back?
Yes, recurrence is possible. The risk depends on the tumour type, the PCI at surgery, and the completeness of cytoreduction. Appendiceal mucinous tumours with CC-0 resection have a particularly favourable prognosis. For colorectal peritoneal metastases, the recurrence rate remains significant — which is why follow-up is essential.

Will I be able to live normally after this surgery?
Most patients return to a good quality of life after recovery. Studies consistently show that quality of life is restored to near-baseline levels by 3–6 months after surgery. Some bowel habit changes may persist, particularly if a significant length of bowel was resected.

What if the disease cannot be completely removed?
If the surgeon finds at the time of surgery that CC-0 resection is not achievable, the planned CRS+HIPEC may be stopped or limited to a less extensive procedure. This decision, though difficult, is the correct one: incomplete cytoreduction (CC-2 or CC-3) does not provide survival benefit over systemic chemotherapy and carries significant operative morbidity.

Acknowledgements

This work would not have been possible without the example and intellectual generosity of three surgeons at the Hospital General Universitario Gregorio Marañón, who have been academic mirrors throughout my training:

Dr. González Bayón, for teaching me that technical precision and scientific rigour are not options but obligations of the surgical oncologist.

Dr. José Luis García Sabrido, master of radical surgery and of reasoned clinical courage, whose vision of the oncological patient continues to guide my practice.

Dr. José Manuel Asencio, for demonstrating that surgical excellence and academic humility are not incompatible — they are inseparable.

All three have been, and remain, inevitable references.

Pablo Lozano Lominchar, MD, PhD, EBPSM | HGUGM / UCM | © 2025

Dr. Pablo Lozano Lominchar · Hospital Gregorio Marañón, Madrid · © 2026
This guide is informational and does not replace a consultation with your doctor. No decision about your treatment should be made from it alone.