Surgical Oncology

A Guide for Patients and Families

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Prologue

Dear patient, dear family,

I have been performing surgery on people with cancer for more than fifteen years. In that time, I have sat across from thousands of patients in consultation rooms, and I have noticed, again and again, the same look: a mixture of trust, fear, and — most of all — a profound need to understand what is happening inside their body and what we are about to do together.

This guide was not written to replace a conversation with your surgeon. It was written because those conversations are always too short. We have an hour, sometimes less, and there is much to explain. You go home with a surgery date and a head full of unanswered questions. This guide exists to answer as many of those questions as possible, in language that does not require a medical degree.

I have tried to be honest throughout. Honest about how difficult some of these operations are. Honest about recovery. Honest about the uncertainty that is inherent in treating cancer. I do not believe in false hope, and I do not believe in unnecessary fear. What I believe in is information — because an

informed patient is a better patient, and a better partner in their own care.

If something in this guide is unclear, or if you have questions that it does not answer, write them down and bring them to your next appointment. There are no foolish questions when it comes to your health.

With respect and commitment,

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1. Understanding Cancer and Surgery

What Is Cancer?

Cancer is not one disease — it is a family of more than two hundred distinct diseases, all sharing one fundamental characteristic: abnormal cells that grow in an uncontrolled way and may invade surrounding tissue or spread to other parts of the body.

In a healthy body, cells grow, divide, and die in an orderly sequence regulated by an intricate molecular signalling system. Cancer begins when errors — mutations — accumulate in the DNA of a single cell, disrupting these signals. The cell begins to divide without restraint, forming a mass of abnormal cells: a tumour. Not all tumours are cancerous. Benign tumours grow locally and do not invade; malignant tumours (cancers) can infiltrate neighbouring structures and release cells into the bloodstream or lymphatic system, eventually settling in distant organs — a process called metastasis.

Why Surgery?

Surgery remains the cornerstone of cancer treatment for most solid tumours. The rationale is straightforward: if a tumour can be physically removed in its entirety — including an adequate margin of surrounding healthy tissue — the chance of cure is substantially higher than with any other current treatment modality.

In modern oncology, surgery rarely stands alone. Most patients receive a combination of treatments: chemotherapy, radiotherapy, targeted therapies, or immunotherapy — either before surgery (neoadjuvant, to shrink the tumour) or after (adjuvant, to reduce the risk of recurrence). Your surgeon will always work within a multidisciplinary tumour board, where specialists from oncology, radiology, pathology, and other fields review your case and agree on the best treatment strategy.

> 📌 **KEY POINT**
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> The goal of cancer surgery is **R0 resection**: complete removal of the tumour with clear (tumour-free) margins. An R0 resection is the single most important factor determining the chance of cure in most solid tumours. Your surgeon will communicate this result once the pathology report is available, usually 7–10 days after surgery.

What Is a Surgical Oncologist?

A surgical oncologist is a surgeon who has completed additional specialist training specifically in the surgical treatment of cancer. This includes not only technical surgical skills, but also a deep knowledge of cancer biology, staging systems, oncological principles (margins, lymph node dissection, en-bloc resection), and the evidence base behind current treatment protocols. Complex oncological surgery — particularly in cases involving the abdomen, retroperitoneum, or pelvis — requires this level of specialisation.

At Hospital General Universitario Gregorio Marañón, our surgical oncology service focuses on four main areas: peritoneal surface malignancies (peritoneal carcinomatosis, pseudomyxoma peritonei, mesothelioma), retroperitoneal and soft tissue sarcomas, complex colorectal and pelvic surgery (including sacral resection and pelvic exenteration), and surgery for liver and biliary tract tumours.

2. Peritoneal Carcinomatosis

What Is Peritoneal Carcinomatosis?

The peritoneum is the thin membrane lining the inside of the abdominal cavity and covering most abdominal organs. Peritoneal carcinomatosis occurs when cancer cells implant on this membrane and grow into visible deposits. The most common sources are colorectal cancer, ovarian cancer, appendiceal tumours (including a condition called pseudomyxoma peritonei), gastric cancer, and primary peritoneal mesothelioma.

Until the late 1990s, peritoneal carcinomatosis was considered untreatable — a terminal stage of cancer. The work of Paul Sugarbaker and, in Europe, surgeons such as Dominique Elias and Marc Pocard, changed this understanding. It is now recognised that, in carefully selected patients whose disease is limited in extent and whose primary tumour type is favourable, surgical removal of all peritoneal deposits combined with intraperitoneal chemotherapy can achieve long-term survival and, in some cases, cure.

CRS + HIPEC: The Surgical Treatment

The standard curative-intent surgical treatment for peritoneal carcinomatosis is **cytoreductive surgery (CRS)** combined with **hyperthermic intraperitoneal chemotherapy (HIPEC)**.

CRS involves the complete removal of all visible peritoneal deposits. This may require removal of portions of the peritoneal lining (peritonectomy), the greater omentum, segments of the colon or small bowel, the appendix, the spleen, or — in women — the uterus and ovaries. The extent of surgery depends entirely on the distribution of the tumour deposits.

HIPEC follows immediately after the cytoreductive surgery. The abdominal cavity is filled with a solution of chemotherapy heated to 41–43°C, which circulates for 60–90 minutes. The combination of chemotherapy and heat targets microscopic residual disease that cannot be removed by surgery alone. Because the drug is delivered directly into the abdomen, systemic toxicity is lower than with conventional intravenous chemotherapy.

How Is the Extent of Disease Measured?

The **Peritoneal Cancer Index (PCI)** is the standard scoring system used to quantify the extent of peritoneal disease. It divides the abdomen into 13 regions and assigns a score (0–3)

to each based on the size of the largest deposit found there, giving a maximum total score of 39.

PCI	Disease Extent	Typical Strategy
0–10	Limited	CRS+HIPEC: favourable prognosis
11–20	Moderate	CRS+HIPEC: possible in expert centres, careful selection
21–30	Extensive	Surgery rarely beneficial; systemic chemotherapy preferred
> 30	Diffuse	Systemic therapy; palliative intent

> 🔑 **KEY EVIDENCE**
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> In appendiceal mucinous tumours with complete cytoreduction (CC-0), 5-year survival rates exceed 80%. In colorectal peritoneal metastases, median overall survival after CRS+HIPEC in experienced centres is 30–41 months, compared to 12–18 months with systemic chemotherapy alone.

⚠️ **CALL YOUR TEAM URGENTLY IF:**

⚠ Fever above 38°C after discharge

⚠ Worsening abdominal pain or distension

⚠ Wound opening, redness, or discharge

⚠ Inability to eat or drink due to vomiting

⚠ Sudden shortness of breath or chest pain

⚠ Swollen, painful leg

3. Retroperitoneal Sarcoma

What Is a Retroperitoneal Sarcoma?

Sarcomas are cancers that arise from the body's connective tissues — muscle, fat, nerves, blood vessels, and fibrous tissue. Retroperitoneal sarcomas develop in the space behind the peritoneum (the retroperitoneum), which contains the kidneys, adrenal glands, aorta, and a large amount of fatty tissue. Because this space is deep and expandable, these tumours can grow to enormous size before causing symptoms. Tumours of 10–20 cm at diagnosis are not unusual.

The most common retroperitoneal sarcoma subtypes are **liposarcoma** (arising from fat cells, further divided into well-differentiated, dedifferentiated, myxoid, and pleomorphic) and **leiomyosarcoma** (arising from smooth muscle). These two subtypes have very different biological behaviours, and their treatment strategies differ accordingly.

Why Does Diagnosis Often Come Late?

The retroperitoneum has no sensory nerves equivalent to those in the skin or gut, so these tumours are often painless.

The first symptoms are usually vague: abdominal fullness or pressure, a palpable mass, or — when the tumour is large — leg swelling if it compresses pelvic veins. Many retroperitoneal sarcomas are discovered incidentally on imaging performed for an unrelated reason.

Surgical Treatment

Surgery is the mainstay of treatment for resectable retroperitoneal sarcoma. The goal is an **R0 resection**: complete removal of the tumour with clear margins. For liposarcoma, which often involves the surrounding fat diffusely, this typically requires removal of the ipsilateral kidney, adrenal gland, and psoas muscle — even if these organs do not appear overtly invaded — as part of a **compartmental resection**. This aggressive approach, validated by the Trans-Atlantic Retroperitoneal Sarcoma Working Group (TARPSWG), significantly reduces local recurrence rates compared to tumour-only excision.

🎯 **CLINICAL PEARL**

Biopsy of a suspected retroperitoneal sarcoma must always be performed by an expert in a specialist centre. An improperly performed biopsy — through the wrong tract, contaminating the peritoneum — can compromise resectability and worsen prognosis. Do not accept a biopsy outside a reference centre if sarcoma is suspected.

What to Expect After Surgery

Retroperitoneal sarcoma surgery is major surgery. Hospital stay is typically 7–10 days. Full recovery takes 6–8 weeks. Because of the size of the tumours and the extent of resection required, the operation carries a significant but manageable complication rate: wound infections, delayed bowel function, and lymphatic fluid collections (lymphoceles) are the most common early complications.

Follow-up after surgery for retroperitoneal sarcoma involves CT scans of the chest, abdomen, and pelvis every 3–4 months for the first 2 years, then every 6 months up to 5 years. Retroperitoneal liposarcoma has a high tendency for local recurrence — in some subtypes exceeding 50% at 5 years — which makes regular follow-up essential.

4. Colorectal Cancer Surgery

Overview

Colorectal cancer — cancer of the colon or rectum — is one of the most common malignancies in the developed world and one of the most successfully treated when diagnosed at an early stage. Surgery remains the primary treatment for localised colorectal cancer, and modern oncological techniques have dramatically reduced recurrence rates over the past three decades.

Principles of Colorectal Cancer Surgery

The fundamental principle of colorectal cancer surgery is removal of the tumour with adequate clear margins and an en-bloc lymph node dissection. For colon cancer, this means a **complete mesocolic excision (CME)** with central vascular ligation — a technique analogous to total mesorectal excision (TME) for rectal cancer, ensuring that the tumour is removed within its embryological tissue planes.

For rectal cancer, **total mesorectal excision (TME)** is the standard. The TME technique involves sharp dissection along

the embryological planes surrounding the rectum, preserving the autonomic pelvic nerves (responsible for bladder and sexual function) while ensuring an intact mesorectal package that contains the tumour, its draining lymph nodes, and the peritoneal envelope. TME has reduced local recurrence rates from over 30% to below 10% in most specialist centres.

Minimally Invasive Surgery

Laparoscopic (keyhole) or robotic colorectal surgery is now standard in most experienced centres. These approaches — performed through small incisions using a camera and specialised instruments — offer significant advantages over open surgery: less pain, faster recovery, shorter hospital stays, and equivalent oncological outcomes. The robot offers particular advantages for rectal surgery in the deep, narrow pelvis.

> 📌 **KEY POINT**
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> The need for a **stoma** (an intestinal opening on the abdominal wall) depends on tumour location and the complexity of the reconstruction. Low rectal tumours often require a temporary loop ileostomy to protect the anastomosis (bowel join). Most temporary stomas can be reversed 3–6 months later, once healing is confirmed. A permanent stoma is required for abdominoperineal resection of the lowest rectal or anal canal tumours.

Recovery After Colorectal Surgery

Enhanced Recovery After Surgery (ERAS) protocols have transformed colorectal surgery recovery. Key elements include early mobilisation, early oral feeding, optimal pain control (avoiding opioids where possible), and pre-operative optimisation of nutritional status. Hospital stays have been reduced from 7–10 days to 3–5 days in most ERAS centres. Full recovery to normal activity typically takes 4–6 weeks.

5. Complex Pelvic Surgery

What Is Complex Pelvic Surgery?

Complex pelvic surgery refers to operations in the pelvis that go beyond standard colorectal or gynaecological procedures — typically required when a tumour involves multiple pelvic structures simultaneously, or when a cancer has recurred after previous treatment. These procedures include **pelvic exenteration** (removal of the rectum, bladder, and — in women — the uterus and vagina), **sacral resection** (removal of the lower sacral bone when involved by cancer), and combined resections for locally recurrent rectal cancer.

When Is This Surgery Needed?

Complex pelvic surgery is indicated when a cancer — most commonly rectal cancer, cervical cancer, or bladder cancer — has grown into multiple adjacent pelvic organs or has recurred locally after initial treatment. The pelvis is a confined space bounded by rigid bony walls, and tumours within it can involve the bladder anteriorly, the sacrum posteriorly, and the pelvic sidewall laterally. In many cases, the only chance of cure is a radical en-bloc resection — removing all involved structures together as a single specimen.

What Does the Operation Involve?

A pelvic exenteration is one of the most extensive operations in abdominal surgery. It typically takes 8–12 hours, involves two surgical teams (abdominal and perineal), and requires reconstruction of the urinary tract (using a segment of ileum as a urinary conduit, or neobladder) and sometimes the pelvic floor and perineum (using plastic surgery flaps). Blood loss may be significant, and transfusion is often required.

When the sacrum is involved, the operation is extended to include sacrectomy — resection of the affected sacral segment. The level of the sacrectomy determines the functional consequences: resection below S2 preserves bladder and bowel continence; above S2, a permanent stoma and urinary diversion are required, and lower limb function may be affected.

> ⚠ **IMPORTANT**
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> These operations are only performed at specialist centres with a dedicated multidisciplinary team (surgical oncology, gynaecology, urology, plastic surgery, anaesthesia, intensive care). The decision to operate is always made collectively, and patients are selected carefully based on tumour characteristics, general fitness, and expected quality of life after surgery.

Recovery and Quality of Life

Recovery from pelvic exenteration takes months, not weeks. The immediate post-operative period involves 2–4 days in intensive care, followed by 2–3 weeks on the ward. Full recovery requires 3–6 months. Studies consistently show that, despite the magnitude of surgery, quality of life in long-term survivors is significantly better than it would have been without surgery — because these patients have, in many cases, been cured of their cancer.

6. Palliative Surgical Oncology

When Cure Is Not the Goal

Not all cancer surgery is performed with curative intent. When a cancer is too advanced to be completely removed — either because of extensive local involvement or distant metastases — surgery may still have an important role in relieving symptoms, preventing complications, and preserving quality of life. This is called **palliative surgery**.

The decision to recommend palliative surgery requires careful weighing of potential benefits against risks and recovery time. A palliative operation should relieve symptoms that significantly impact quality of life, and the benefit should outweigh the risks and the recovery burden — particularly in a patient who is already weakened by disease or systemic treatment.

Common Palliative Surgical Situations

Bowel obstruction: When a tumour blocks the intestine, surgery or endoscopic stenting can relieve the obstruction and restore the ability to eat normally. This is one of the most common reasons for palliative surgery in colorectal cancer.

Bleeding: Tumours that bleed persistently may require surgical control when endoscopic or radiological techniques are not sufficient.

Perforation: A perforated bowel — whether from tumour invasion or chemotherapy effect — is a surgical emergency requiring immediate intervention.

Ascites drainage: Recurrent accumulation of fluid in the abdomen (ascites) from peritoneal disease can cause severe discomfort and breathlessness. Repeated drainage (paracentesis) or — in selected cases — surgical procedures to control fluid production may be appropriate.

> 💡 **PRACTICAL NOTE**
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> If you are being considered for palliative surgery, it is always appropriate to ask your surgical team: "What is the goal of this operation?" and "What are we expecting in terms of benefit, and for how long?" Clear communication about goals ensures that surgical decisions are aligned with your own values and priorities.

7. Recovery and Life After Surgery

The First Days in Hospital

After major cancer surgery, you will spend the first 1–3 days in the intensive care unit or high-dependency unit, depending on the extent of the operation and your baseline health. This is a routine precaution — not a sign that something has gone wrong. You will have monitoring lines, a urinary catheter, one or more abdominal drains, and an intravenous line. Pain will be managed with an epidural catheter or patient-controlled analgesia. You will be encouraged to sit up and walk — with assistance — as early as day 1 or 2.

Going Home

Discharge criteria vary by procedure, but in general you will be ready to go home when you can eat a normal diet, control pain with oral medications, walk independently, and your wounds are healing. Do not be concerned if this takes longer than expected — individual recovery varies enormously.

The First Month at Home

Activity: Walk daily — start with short distances and increase gradually. Avoid lifting more than 5 kg for 6 weeks. Do not drive for 4–6 weeks (longer if you had pelvic surgery). Avoid strenuous exercise until cleared by your surgeon at the post-operative review.

Diet: Prioritise protein (meat, fish, eggs, legumes, dairy). Eat small, frequent meals if appetite is poor. Drink at least 1.5 litres of water daily. Avoid very fatty, spicy, or gas-producing foods until bowel function normalises. If you have a stoma, follow your stoma nurse's dietary guidance specifically.

Fatigue: Profound fatigue is normal after major surgery and often persists for 6–12 weeks. This is a physiological response. Rest when necessary, but avoid complete bed rest during the day as it will slow recovery.

Wound care: Keep incisions clean and dry. Report any redness, warmth, swelling, or discharge to your surgical team promptly.

Follow-Up and Surveillance

Follow-up schedules vary by tumour type and surgery performed. In general, expect a clinic visit at 4–6 weeks post-operatively, then imaging (CT scan) at 3-monthly intervals for the first 2 years, followed by 6-monthly imaging to year 5. Tumour markers are checked at each visit. Attend all appoint-

ments — early detection of recurrence, when it may still be treatable, depends on it.

8. When to Call Your Doctor

After cancer surgery, most symptoms of concern develop gradually and give you time to call your surgical team during working hours. Some, however, require immediate action. Know the difference.

Call Immediately (Emergency)

⚠️ **EMERGENCY — CALL 112 OR GO TO EMERGENCY:**

⚠ Sudden, severe abdominal pain (different from the usual post-operative discomfort)

⚠ Shortness of breath, chest pain, or rapid heart rate

⚠ Sudden confusion or loss of consciousness

⚠ Coughing or vomiting blood

⚠ Bright red blood from a wound, stoma, or drain in large quantity

⚠ High fever (above 39°C) with shaking and rapid heartbeat (possible sepsis)

Call Your Surgical Team Within 24 Hours

⚠ **CONTACT YOUR TEAM:**

- Fever above 38°C not resolving within 24 hours
- Wound redness, warmth, increasing swelling, or yellowish discharge
- Progressive abdominal swelling or pain
- Vomiting that prevents eating or drinking for more than 24 hours
- No bowel movement for more than 5 days after discharge
- Swollen, red, or painful leg (possible deep vein thrombosis)
- Urine that is very dark, cloudy, or absent for more than 8 hours
- Drain output that suddenly changes colour or significantly increases

Normal Post-Operative Symptoms

The following are expected and not cause for alarm, provided they are mild and improving:

- Tiredness and fatigue — normal for weeks to months

- Mild wound discomfort — should be improving each day
- Occasional nausea — especially when starting to eat
- Irregular bowel function for the first 2–4 weeks
- Night sweats — common in the first 1–2 weeks
- Reduced appetite — gradually improving over 4–6 weeks

9. Frequently Asked Questions

How long will I be in hospital?

This depends entirely on which operation you have. Minimally invasive colorectal surgery: 3–5 days. Open colorectal surgery: 5–8 days. CRS+HIPEC: 10–14 days. Retroperitoneal sarcoma surgery: 7–10 days. Pelvic exenteration: 14–21 days. These are averages — individual recovery varies.

Will I need chemotherapy after surgery?

In most cases, yes — although this depends on the tumour type, stage, and pathological findings. Your medical oncologist will discuss adjuvant chemotherapy recommendations once the pathology report is available, typically at 4–6 weeks post-operatively.

Can the cancer come back?

Recurrence is always a possibility, and the risk varies greatly by tumour type, stage, and the completeness of the surgical resection. This is why follow-up is essential. The aim is to detect any recurrence early, when it may still be amenable to further treatment.

Will I need a stoma?

Not all patients require a stoma. Your surgeon will discuss

this possibility before the operation and explain whether any stoma planned is temporary (reversible after 3–6 months) or permanent. Do not hesitate to ask your stoma nurse all your questions — they are specialists in stoma management and patient education.

When can I return to work?

After minimally invasive surgery: 4–6 weeks. After open abdominal surgery: 6–8 weeks. After CRS+HIPEC or pelvic exenteration: 3–6 months. These estimates assume a desk job or light-duty work; physically demanding jobs may require longer. Your surgeon will provide a specific recommendation at your post-operative visit.

Can I eat normally after the operation?

In most cases, yes — after a period of gradual dietary progression. Some procedures (extensive small bowel resection, pelvic surgery) may result in lasting changes in bowel function. Your surgical team will guide you on any specific dietary modifications required.

Is it safe to fly?

Air travel is not recommended for the first 4–6 weeks after major surgery due to the risk of deep vein thrombosis. After that, short-haul flights are generally safe; for long-haul travel, ask your surgeon for specific advice.

What happens if the surgery cannot be completed as planned?

Sometimes, the extent of disease found at surgery differs from what imaging predicted, and the planned operation must be modified or abandoned. Your surgeon will always make intra-operative decisions in your best interest. If this occurs, the findings will be discussed with you and the multidisciplinary team, and an alternative treatment plan will be developed.

Who do I contact if I have concerns at night or at weekends?

Your discharge paperwork will include emergency contact numbers. Most surgical departments have an on-call system accessible 24 hours a day. For urgent concerns, do not hesitate to call.

Glossary

Adjuvant treatment: Treatment given after surgery to reduce the risk of recurrence (e.g., adjuvant chemotherapy).

Anastomosis: The surgical join between two segments of bowel after a section has been removed.

Ascites: Abnormal accumulation of fluid in the abdominal cavity, often caused by peritoneal cancer or liver disease.

CC-0: Complete cytoreduction — no visible residual tumour after surgery. The target of CRS+HIPEC.

CRS (Cytoreductive Surgery): Surgery to remove all visible peritoneal tumour deposits.

HIPEC: Hyperthermic intraperitoneal chemotherapy. Heated chemotherapy delivered directly into the abdominal cavity during surgery.

Laparoscopy: Minimally invasive surgery using a camera inserted through small incisions (keyhole surgery).

Liposarcoma: A sarcoma arising from fat cells. The most common retroperitoneal sarcoma subtype.

Lymphadenectomy: Removal of lymph nodes as part of cancer surgery to assess or treat nodal spread.

Margin (R0/R1/R2): The status of the surgical margin. R0 = tumour-free; R1 = microscopic tumour at margin; R2 = macroscopic residual tumour.

Mesorectal excision (TME): The standard surgical technique for rectal cancer, removing the rectum within its embryological fascial envelope.

Metastasis: Spread of cancer from its primary site to distant organs via the bloodstream or lymphatics.

Neoadjuvant treatment: Treatment given before surgery to reduce tumour size and improve resectability.

PCI (Peritoneal Cancer Index): A scoring system (0–39) measuring the extent of peritoneal carcinomatosis.

Peritoneum: The membrane lining the abdominal cavity and covering most abdominal organs.

R0 resection: Complete surgical removal of a tumour with clear margins and no residual disease.

Retroperitoneum: The anatomical space behind the peritoneum, containing the kidneys, aorta, and retroperitoneal fat.

Sarcoma: A malignant tumour of connective tissue (muscle, fat, nerves, blood vessels).

Stoma: A surgical opening on the abdominal wall allowing intestinal contents (colostomy/ileostomy) or urine (urostomy)

to exit the body.

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.