



# The Cutting Edge

By Barbara Boughton

*Surgical advances offer patients innovative treatment options and improved quality of life.*

David Litvak, MD, surgical oncologist at CTCA in Phoenix, Arizona.

IN DECEMBER 2008, Jamie Hyslope, 33, learned that her breast cancer had spread to both her liver and her lungs. “I hit rock bottom,” she says, “and I thought I was living on borrowed time.” Then she contacted Cancer Treatment Centers of America® (CTCA) and learned that treatments there could enable her to aggressively fight the cancer. One of these treatments—an innovative surgery called laparoscopic liver resection—helped remove the cancer in her liver. Because of a rapid recovery, Jamie was also able to start chemotherapy much earlier than after traditional open surgery.

“When someone says ‘liver surgery,’ you expect to be down for weeks, with a lot of pain. But that wasn’t the case after

having laparoscopic liver surgery,” she says. Liver resection is major surgery, but doing it laparoscopically means that the incisions are smaller than with standard surgery. And that means patients experience less pain and recover more quickly afterward. “Within a week of getting home after the surgery, I had resumed most of my daily activities—including doing laundry and taking my children to school,” Jamie says. “The recovery time was no different than when I had an appendectomy,” she adds.

Laparoscopic liver resection is just one of a number of medical innovations that are improving outcomes and quality of life for cancer patients today. At CTCA several new cutting-edge surgical

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therapies can benefit patients with even aggressive tumors and can reduce side effects. These therapies include laparoscopic liver resection, hyperthermic intraperitoneal chemotherapy (abdominal surgery combined with hyperthermia and chemotherapy), and intraoperative radiation therapy (which uses a single high dose of radiation therapy during surgery).

#### Laparoscopic Liver Resection

In laparoscopic liver resection, surgeons make several small incisions rather than one large incision, as with conventional liver surgery. A needle is inserted to expand the abdomen with carbon dioxide gas to allow room for instruments to be inserted and for the surgeon to work on organs. The surgeon uses specialized instruments to visualize the abdominal



Charles Komen Brown, MD, PhD, surgical oncologist and director of surgery at CTCA in Zion, Illinois.

cavity, including a small telescope with a camera attached, and to remove sections of the liver that are cancerous or have precancerous tumors known as adenomas, according to David Litvak, MD, surgical oncologist at CTCA in Phoenix, Arizona.

“Patients have less pain right away with laparoscopic liver surgery, a shorter hospital stay, and a quicker recovery time at home,” says Dr. Litvak. “They can also resume other treatments such as chemotherapy more rapidly because they recover from surgery in less time than with open surgery.” Compared with open surgery, laparoscopic liver resection reduces recovery time by at least two weeks, according to Dr. Litvak. After laparoscopic surgery, patients usually need just one day in the intensive care unit (ICU) and three to four days for total hospital recovery. Open liver surgery, on the other hand, often requires two days

in the ICU and up to seven or more days for hospital recovery. Recovery at home is also easier and faster after laparoscopic surgery.

Scientific studies have shown that blood loss and surgical outcomes in laparoscopic liver resection are equal to those of open surgery, and recovery time and hospital stays are reduced, says Dr. Litvak. Whereas colon surgeries for cancer are often done laparoscopically today, only a handful of medical centers offer laparoscopic liver resection. It’s a demanding surgery that involves in-depth training in both liver and laparoscopic surgery—a set of skills that not all surgical oncologists have, Dr. Litvak says.

#### Hyperthermic Intraperitoneal Chemotherapy

Another advanced surgical procedure is hyperthermic intraperitoneal chemotherapy (HIPEC), which uses sterilized,



David Litvak, MD, consults with Jamie Hyslope.

heated chemotherapy applied to the abdomen after surgery to treat advanced cancers. The procedure is helpful in treating gastrointestinal and gynecologic cancers that have spread in the abdomen and involve cancer on the exterior surface of abdominal organs.

Charles Komen Brown, MD, PhD, surgical oncologist and director of surgery at CTCA in Zion, Illinois, is one of about 20 surgical oncologists in the United States who regularly perform HIPEC. According to Dr. Brown, “Once the abdominal cavity has tumors or tumor cells, it’s considered a contaminated space, and tumor cells can come back even after you remove all visible tumors. The idea of HIPEC is to combine surgery with chemotherapy to ‘sterilize’ the abdominal cavity from tumor cells.”

The HIPEC procedure is useful for patients with abdominal tumors that

haven’t spread to organs such as the liver or the lymph nodes outside the abdominal cavity. During surgery as much tumor is removed as possible, then any remaining cancer is treated with a sterilized, heated chemotherapy solution that circulates through the abdominal cavity for 90 minutes. The procedure allows for higher doses of chemotherapy than are usually possible with standard chemotherapy delivery because HIPEC isolates the chemotherapy to the abdomen, thereby minimizing exposure to the rest of the body. Heating the solution—called hyperthermia—enhances the power of the chemotherapy, improving absorption by tumors and susceptibility of tumor cells to chemotherapy, Dr. Brown says. Because it’s restricted to the abdomen, HIPEC minimizes the side effects of chemotherapy, he adds.

A scientific study by Dutch

researchers published in 2003 showed that the HIPEC procedure doubled survival time in patients with colon cancer whose disease had spread to the abdomen when compared with treatment with surgery and systemic chemotherapy. The study was a randomized clinical trial, in which two groups of patients received different treatments, and outcomes were assessed. The study was published in the *Journal of Clinical Oncology*.

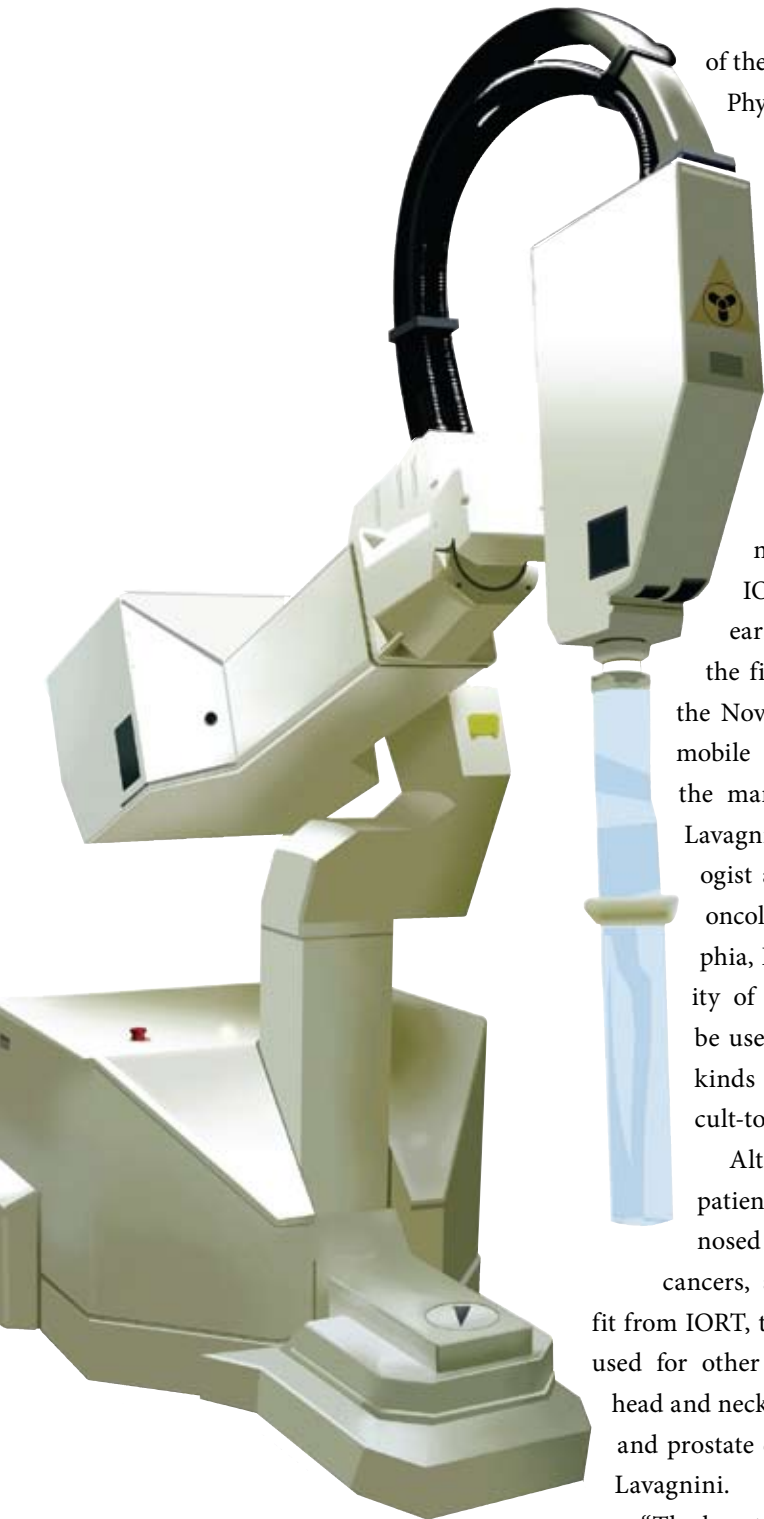
The HIPEC procedure can also improve quality of life for those who have bulky tumors that cause pain or bowel obstruction, Dr. Brown says. After recovering from the procedure, patients continue to receive standard systemic chemotherapy.

The HIPEC procedure is complex, requiring six to 12 hours for surgery and delivery of the chemotherapy. “It demands time, expertise, and a trained team that can provide treatment for patients who have quite complicated cancers,” Dr. Brown says.

#### Intraoperative Radiation Therapy

CTCA has also added intraoperative radiation therapy (IORT) to its surgery and radiation oncology program. In this cutting-edge procedure, a high dose of radiation—targeted to the patient’s tumor bed immediately after its removal—is used for treatment at the same time as surgery.

Until recent years surgeons performing IORT had to transport patients to a radiation oncology suite housing the large radiation machine, or linear accelerator, typically used to deliver radiation right after surgery, according to a report



CTCA in Philadelphia will be the first hospital in the country to offer Intraoperative Radiation Therapy (IORT) using a mobile linear accelerator that applies a single dose of radiation to a tumor in the operating room at the time of surgery.

of the American Association of Physicists in Medicine.

The development of mobile linear accelerators—machines that can be transported to surgical suites to deliver radiation—however, has made this treatment easier and more beneficial. CTCA is one of only a handful of medical centers that offer IORT with a mobile linear accelerator and will be the first in the country to use the Novac7, considered the most mobile linear accelerator on the market, according to Pablo Lavagnini, MD, radiation oncologist and director of radiation oncology at CTCA in Philadelphia, Pennsylvania. The mobility of the Novac7 allows it to be used to treat many different kinds of cancer—even in difficult-to-reach sites.

Although breast cancer patients, along with those diagnosed with stomach and rectal cancers, are most likely to benefit from IORT, the procedure can also be used for other cancer types, including head and neck, lung, esophageal, rectal, and prostate cancers, according to Dr. Lavagnini.

“The beauty of IORT is that you can give a large dose of radiotherapy, but because it’s done during surgery, we can protect sensitive areas adjacent to the tumors,” Dr. Lavagnini says. After IORT, patients may still need conventional

radiotherapy to complete their treatment. Yet by using IORT as a “boost” to conventional radiation treatment, patients can reduce treatment time with conventional radiotherapy by several weeks. Dr. Lavagnini says that by using the Novac7 in IORT, breast cancer patients undergoing surgery may even be able to forgo the usual six weeks of radiation therapy. The IORT procedure can be used for patients undergoing lumpectomy as well as those undergoing mastectomy, he says. IORT also makes nipple-sparing mastectomy safer, according to Dr. Lavagnini, because it reduces the risk of cancer recurrence.

Adding radiation therapy to surgery generally adds about half an hour to the entire procedure, but it can reduce side effects from radiation therapy, Dr. Lavagnini says. As well as having the maximum effect on any microscopic tumor cells, it improves quality of life because it reduces the number of radiation treatments. Cosmetic results are also improved with IORT. And, because the radiation during surgery is combined with mobile shields, there is little radiation leakage and no undue risk of undesired radiation exposure, according to Dr. Lavagnini.

As with other treatment innovations at CTCA, IORT provides a powerful treatment option that improves quality of life. “With IORT we can tailor treatment to the specific patient—giving them the most critical part of their treatment with little or no damage to adjacent tissue,” Dr. Lavagnini says. [CFThrive](#)