



“Did the
doctor get
all of my
cancer?”

Breast cancer

Carilion doctors pioneer groundbreaking technique

That's a question that weighs on many women after surgery for breast cancer. They wait, often for days, for a pathology report that will show whether the surgeon was able to find and remove all of the cancer.

Over the last two years, women who underwent breast cancer surgery at Carilion hospitals in Roanoke and Bedford have had a better chance than most of hearing a “yes” answer to that question—and avoiding second and third surgeries to remove their cancer.

That's because the Carilion system is one of just two hospital systems in the United States that is pioneering the use of large-format slides for analyzing breast tissue, as part of a comprehensive program designed to detect the smallest cancers possible and assure that all cancer is removed during a single surgery.

“We're truly leading the country in this regard,” says F. Lee Tucker, MD, FCAP, Chairman of Pathology and Laboratory Medicine and medical director for Carilion Breast Care Center.

In the two years since the program began, about 800 patients have had breast cancer surgery. Only 15 percent of those patients required a second surgery to remove cancer found later, while 25 percent required such surgery prior to 2004, Tucker says.

By Deanna L. Thompson

“The percentage of patients with an inadequate surgical margin has fallen by 50 percent,” he says.

“Inadequate surgical margin” is a medical term indicating that cancerous tissue was found at the edges of the area removed by the surgeon. When that occurs, the surgeon typically does a second surgery to remove tissue in a wider area.

Joining hands to find cancer

Ensuring adequate margin is not a simple task, because most breast cancer found today is too small to be felt with the hand or seen with the eye. At Carilion, surgeons, radiologists, pathologists and oncologists have joined together to make that important job easier.

The work begins at diagnosis. After mammography, women with breast cancer typically undergo sophisticated imaging procedures, such as ultrasound or Magnetic Resonance Imaging (MRI), to pinpoint the cancer.

Next, the surgeon, radiologist, pathologist and oncologist meet to examine the images and discuss treatment options.

During surgery, the surgeon uses the imaging studies as a guide to locate the cancer and stay properly oriented in the breast.

To ensure that no cancer is missed, the radiologist is on standby, ready to X-ray the tissue removed by the surgeon and to compare it to previous imaging studies. If the radiologist sees signs of cancer at the edges of the removed tissue, the surgeon returns to the cancer site to remove more.

Also on standby is a pathologist, who may examine the tissue after the radiologist. Again, if the pathologist sees cancer cells at the edges of the tissue, the surgeon returns to the patient to remove more tissue.

Pioneering technique helps patients

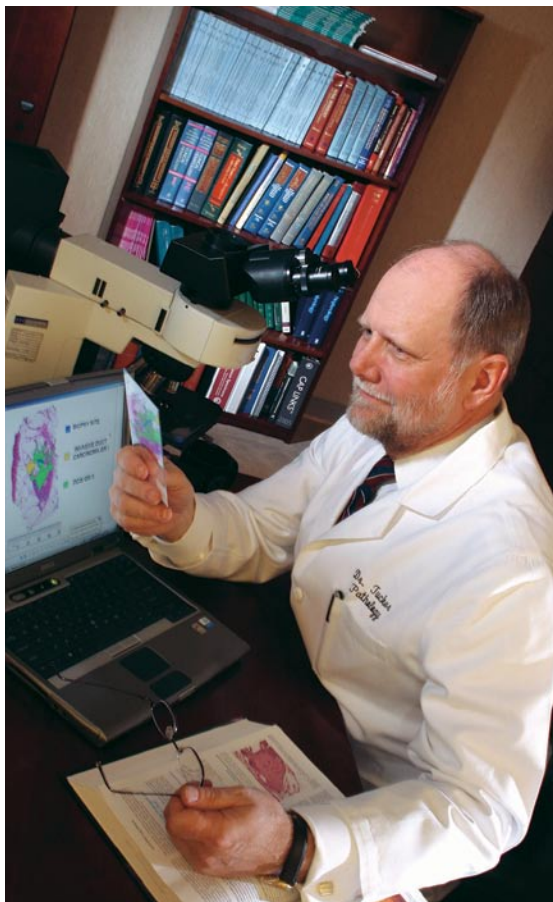
This team approach helps doctors find more cancer during surgery. However, the key to reducing the number of second surgeries for breast cancer patients has been the move to large-format slides for analyzing tissue after the operation.

Most pathologists look at small portions of the removed tissue on standard 1-inch-by-3-inch slides. At Carilion, Tucker examines the entire width of the tissue on a large-format slide, a technique he learned in Sweden from Laszlo Tabar, MD, generally regarded as the father of mammography.

“Let’s take a lemon as an example,” Tucker says. If you cut small pieces from the lemon in various places and analyze them, you may miss something, he notes. That is, in essence, what pathologists do with breast tissue on traditional slides.

Using the large-format slide—about the size of a DVD case—Tucker can look at an entire slice of breast tissue (imagine a lemon slice), making it less likely that cancer cells will be missed.

“Large-format slides enable us to examine 100 percent,” he notes. “We’re able to trace the entire surgical



F. Lee Tucker, MD, FACP

outline, while the traditional methods only examine 16 percent of it.”

When the large-format analysis shows cancer cells at the margin of breast tissue, the pathologist shares those results with surgeons and radiologists, who can compare that information to imaging studies of the same area and help develop new understanding of breast cancer that helps them on the next case.

“The learning that takes place is the key,” says Tucker. “Because of the team working together like this, we have been able to reduce the number of second surgeries.”

Doctors breaking new ground

Tucker is compiling data for a study documenting the effectiveness of the system, which is used for all breast cancers treated at Roanoke Memorial Hospital, Roanoke Community Hospital and Bedford Memorial Hospital. Carilion plans to phase it in at the other hospitals soon.

Tucker believes that the collaborative techniques used at Carilion eventually may be applied nationally to improve outcomes for breast cancer patients.

“Breast cancer is curable in its early stage, in many cases with surgery alone,” Tucker says. “When breast cancer recurs in a patient, it’s not a mystery. It’s just pretty simple biology; the disease was not completely removed the first time.”