



## ONE OPTION MORE

"You have breast cancer." When **Carole Gekoski** first heard these terrifying words in December 2003, she was not at a Penn Medicine hospital. She wishes she had been.

"You're suddenly thrown into categories. The size and type of tumor, whether it's invasive or not. Every cancer is different and so are the treatment options," says Gekoski. "My cancer was DCIS (ductal carcinoma in situ) which is non-invasive, but the tumor was fueled by the HER-2 protein, making its growth aggressive. Now I tell people, if that's what you have — and one out of five DCIS patients do — call Dr. Brian Czerniecki."

By the time she came to Penn, Gekoski had undergone a biopsy and two lumpectomies elsewhere. Questionable lab results regarding micro-invasion led to a sentinel node biopsy. That's when she met Czerniecki, who told her that, if not for the previous surgeries, she would be the ideal candidate for his DCIS vaccine trials. "If I hadn't gone to Penn, I would have never known about this experimental vaccine," Gekoski says.

It would take a reversal of fortune to connect her with this novel treatment. In July 2006, months after a normal mammogram, Gekoski had an MRI. "The tumor lit up like a light bulb, in the same exact place." The DCIS was still there despite surgeries and six weeks of radiation.

Gekoski knew she wanted the vaccine and knew it needed to precede further surgery. Czerniecki requested a special exemption from the Institutional Review Boards and the FDA. A few weeks later, a friend was feeding Gekoski antacids as they took blood from one arm and put it back in the other for the leukapheresis necessary to make her vaccine. After four weekly treatments and bouts with flulike symptoms, the protocol was completed. An MRI and surgery confirmed the cancer was — and still is — gone.

"Penn's on the cutting edge. They have the technology and research. If you're HER-2 positive, you need to come here. It's not a competition. It's about saving lives."



**“WE HAVE ALWAYS SAID THE TRUE CURE FOR SOLID-MASS CANCERS COMES FROM THE DEPARTMENT OF SURGERY. THAT WILL CONTINUE TO BE TRUE, EVEN AS WE WORK TO MAKE SURGERY LESS NECESSARY.”**

— Douglas Fraker, MD, *Vice Chair and Chief, Endocrine and Oncologic Surgery*

## REGIONAL LEADERSHIP

# BRAVE NEW WORLD

**BRIAN CZERNIECKI, MD, PHD**, is identifying the best way to attack breast cancer in its earliest stages. In the process, he helps make the case that Penn Surgery is the best place in the Philadelphia region for cancer care.

Czerniecki’s exciting breakthrough is a vaccine that generates strong and sustained immune responses in patients with ductal carcinoma in situ (DCIS), an early, non-invasive form of breast cancer. It functions by injection into lymph nodes, presenting dendritic cells as quickly as possible to the patient’s T cells and spurring a strong immune response.

“Even though this cancer is early, cases that over-express the oncogenic protein HER-2/neu carry a high risk of becoming invasive,” explains Czerniecki, who came to Penn Surgery from the National Cancer Institute in 1995. “The key is to use the patient’s own immune system — while the patient is healthy.”

Penn’s vaccine production facility, a rare in-house resource, builds a vaccine from the patient’s own white blood cells that are “fed” small pieces of the HER-2/neu protein. For many DCIS patients, this protein is the causal link to breast cancer. The injected vaccine then causes their bodies to begin fighting back much earlier than they otherwise would.

## A STEP AHEAD

For Penn Surgery, this evolving research, just entering Phase II, may be its most promising discovery yet. While other institutions are studying late-stage cancer vaccines, Penn Surgery is unique in emphasizing early immunotherapy with an eye to prevention.

“One day, all women — especially those with a marked risk of breast cancer — will be able to come in after child-bearing years and receive a vaccine that will put their bodies on high alert *before the first cell mutates*,” Czerniecki predicts.

Many more steps must happen first. Czerniecki has finalized Phase I findings and these have been submitted for publication. Confirmatory studies will follow at Penn and other sites.

The approach might also be tested with other cancers that can be detected early, a process that is already under way. Czerniecki and his team recently began working with gynecologic oncology to vaccinate ovarian cancer patients.

At Penn Surgery, what once sounded like science fiction — a vaccine to prevent cancer — is quickly becoming science fact.

## PENN SURGERY IS THE REGION’S BUSIEST CANCER CARE CENTER BASED ON NEW-PATIENT VOLUME, SUPPORTED BY THESE ASSETS:

- The Perelman Center for Advanced Medicine bolsters Penn Surgery’s regional leadership across many divisions. In cancer care, it integrates the work of surgeons and medical and radiation oncologists, and houses the Abramson Cancer Center and the Rena Rowan Breast Center.
- Oncologic surgeons at Penn, led by Vice Chair and Division Chief Douglas Fraker, MD, generate the best outcomes despite taking on tumors labeled “untreatable” elsewhere.
- The region’s dominant endocrine surgery practice performs some 500 minimally invasive parathyroidectomies each year.
- Penn’s outstanding cancer research and community education programs, including Oncolink.org, became the Web’s first cancer resource in 1994.

*(pictured left) Brian Czerniecki, MD, PhD, works for a future in which vaccines are a first line of defense against many cancers, beginning with breast cancer.*