

Preserving Heart Function While Surviving Cancer

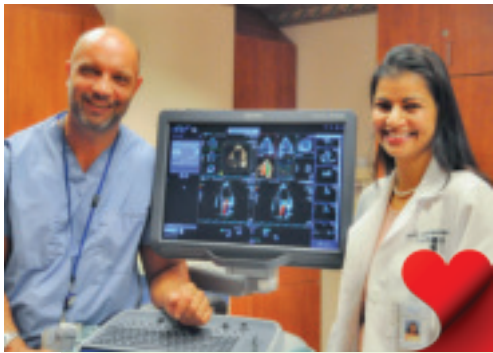
How advanced technology at NCH is protecting the hearts of cancer patients

a cancer diagnosis and corresponding treatment can be overwhelming. The primary goal is to fight the cancer. And while cancer patients undergoing chemotherapy are well-aware of some unpleasant side effects, a lesser-known side effect of certain chemotherapy drugs is that they may be cardiotoxic—meaning the drugs may cause damage to the heart muscle. Some patients who receive potentially cardiotoxic therapies may be susceptible to cardiac involvement. In these cases, the heart may not be able to perform properly and maintain the health of the body.

Bill Shirkey, Director of Cardiac Imaging, along with Dr. Shona Velamakanni, Medical Director of the Echocardiography Lab at NCH Healthcare System, utilize advanced imaging technologies to assess patients for potential cardiotoxicity. Shirkey became interested in forming a cardio-oncology collaboration and adding advanced technologies to NCH after his friend's son developed terminal congestive heart failure following treatment with cardiotoxic chemotherapy.

The NCH echo lab uses 3-D echocardiography and a state-of-the-art measurement known as Global Longitudinal Strain to gauge the health of the heart—specifically, how well the left ventricle of the heart contracts and relaxes. Patients receive a baseline study, and all follow-up echos are performed at regular intervals as determined by the patients' oncologist. Based on findings, the oncologist may modify the patient's chemotherapy regimen and





**Bill Shirkey, Director of Cardiac Imaging;
Dr. Shona Velamakanni, Medical Director
of Echocardiography Lab**

refer the patient to a cardiologist for further assessment and care. Per Dr. Velamakanni, “both the cardiologist and oncologist work collaboratively to determine the best course of treatment for the patient so that, together, we can beat the cancer and keep the heart muscle strong.”

Patient Impact

Carmen Hoffmann, 67, of Naples, discovered she had breast cancer when she went for a routine mammogram. The cancer was fast-growing and had already spread to her lymph nodes. She underwent surgery quickly and soon thereafter began chemotherapy, followed by radiation. One chemical that was present throughout her yearlong treatment was Herceptin. Because Herceptin is a drug associated with cardiotoxicity, and because of the length of time the drug is taken, Hoffmann’s oncologist sent her to the NCH Cardiac Imaging Lab to have her heart muscle evaluated before her treatment began (to get a baseline measurement) and also evaluated every three months thereafter.

During these evaluations, the 3-D echocardiogram provided crucial information.

“Twice during my treatment, the tests showed that my heart was performing under 50 percent capacity,” Hoffmann says. Each time, her doctors had her go

off the Herceptin for a month or two.

Dr. Velamakanni explains: “Chemotherapy is targeted toward killing cancer cells, but it may also affect healthy cells throughout the body, including the heart. Altering the chemotherapy regimen and/or starting certain heart-strengthening medications may help the heart pump recover faster during the course of treatment.”

In Hoffmann’s case, her doctors simply gave her body a rest from the Herceptin so the heart muscle could recover. When her course of treatment was over, she did not have the heart damage she might have had without those resting periods.

“Patients who suffer from cardiotoxicity may have long-term damage to the heart,” Dr. Velamakanni says. “It could put them at risk for a later cardiac event, from congestive heart failure even to death, which is why we work together on preventive measures.”

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On the Mend

At her most recent check, Hoffmann’s doctors found her cancer to be in remission, and her last echocardiogram showed her heart to be in good shape. “The treatment worked,” she says, “which is a very good thing. It’s been a long journey.”

How can other patients protect themselves from the potential dangers of chemotherapy? “Ask a lot of questions,” Dr. Velamakanni says. “What are the side effects of chemotherapy to my body?” It helps patients to be proactive and to learn about their course of treatment,” she says.

WHAT IS CARDIOTOXICITY?

Cardiotoxicity is any sort of damage to the heart muscle that keeps the muscle from pumping blood through the body. The damage is often due to chemotherapy drugs but can come about from different types of medications, too. Severe cardiotoxicity can lead to cardiomyopathy, a severe injury to the heart muscle in which the muscle can no longer function to pump blood. Left untreated, cardiomyopathy generally leads to heart failure.

If you are undergoing chemotherapy treatment for cancer, you should be on the lookout for symptoms of cardiotoxicity and cardiomyopathy. Some of these symptoms are:

- You may feel **fatigued or weak**. Carmen Hoffmann reported that when her heart function was low, she had trouble doing simple things like climbing a flight of stairs.
- You may be **short of breath** frequently, whether you are at rest or active.
- You may have **trouble lying on your back** in bed and find yourself more comfortable when you prop yourself up on pillows while sleeping.
- You may be **awakened in the middle of the night** by shortness of breath.
- You may notice that your **legs are swollen**, especially your feet and ankles.
- You may **feel bloated and gain weight** easily.
- You may notice you are **coughing a lot more than usual**, particularly if the heart damage has gone on for a long time. (You may be developing congestive heart failure.)

If you are experiencing any of these symptoms, particularly if you are undergoing chemotherapy, be sure to let your doctor know right away, and ask him or her to check for heart damage. **NH**

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Carmen Hoffmann's treatment at NCH prevented damage to her heart as she underwent chemotherapy and radiation for breast cancer.



PHOTO BY ERIK KELLAR