Screening for Breast and Lung Cancers

Breast cancer rates generally increase with age. Between 2000 and 2004, 95 percent of new cases occurred in women over 40. It is estimated that 213,380 new cases of lung cancer, the leading cause of cancer deaths, occurred in the United States in 2007.

Healthy Living magazine recently assembled four Eisenhower Medical Center experts to discuss the imaging technology available for cancer screening and the latest information about lung and breast cancer screenings. The participants were Adam Brochert, MD, Radiology, Leora Lanzkowsky, MD, Medical Director of the Eisenhower Schnitzer/Novack Breast Center, and Davood Vafai, MD, Medical Oncology. Philip Shaver, MD, Cardiology, served as moderator.

DR. SHAVER: We'll begin with talking about some of the different imaging modalities. Adam, I'll start off with you. I think there are so many acronyms that generally confuse people. Let's start with digital imaging, often used in mammography screening. Is it an X-ray?

DR. BROCHERT: Yes, it's a highly specialized form of an X-ray.

DR. SHAVER: What advantages does digital mammography have?

DR. BROCHERT: Before we had digital, we were basically printing onto a piece of film, so it's essentially like creating a painting, and there's room for subjectivity.With digital, we can change the brightness and the different hues on the screen and hone in or zoom out. It also allows us to integrate the images with computers, where we can use computer-aided detection to improve our ability to detect cancers.

DR. SHAVER: Does digital imaging expose patients to less radiation?

DR. BROCHERT: In general, yes. Also, digital imagery is more stable and easily stored.

DR. SHAVER: Leora, is digital imaging only useful for specific women in breast imaging?

DR. LANZKOWSKY: Digital is far superior to film mammography for most women, except those with extremely fatty breast tissue.

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DR. SHAVER: The rate of death from breast cancer decreased 23 percent between 1989 and 2003, largely due to the role of mammography in detecting early stage cancers. What are your thoughts on screening recommendations?

DR. LANZKOWSKY: At Eisenhower, we start annual screening from the age of 40, unless there is a significant family history, in which case we begin mammography screening earlier. If the person has a very high risk, additional tests should be added, such as MRI (Magnetic Resonance Imaging) or BSGI (Breast-Specific Gamma Imaging).

DR. SHAVER: Adam, how is MRI different?

DR. BROCHERT: MRI is based on magnetic principals rather than X-ray beams. We have a new scanner here that is a hybrid design that combines the best of an open system, which patients like because it reduces claustrophobia concerns, and the power of a closed system which provides good images. Patients and physicians love it.

DR. SHAVER: Of course, patients with pacemakers cannot have an MRI.

DR. BROCHERT: Correct. We have a rigorous screening questionnaire asking about implantable devices in the patient's body to ensure patient safety.

DR. SHAVER: What about our patients who have had titanium joints or coronary stents, is there any problem with them having MRIs?

DR. BROCHERT: No. The traditional rule of thumb with coronary stents—or any surgery—is to wait six weeks after the stent is implanted. Titanium implants are not affected by the magnet and are not a safety threat to the patient. I think any patient who has an implanted device should be very open about it when they go to have an MRI. They will be asked, especially if they come to Eisenhower, but it is a way for them to protect themselves.

DR. SHAVER: Patients may be concerned if they have to come back for more imaging after their initial mammography screening. Can you explain the process, Leora?

DR. LANZKOWSKY: About 15 to 20 percent of women are called back for further imaging. The screening study is just a first step, and often we need to more closely investigate a particular area of the breast either from another angle or by using another type of test such as ultrasound, BSGI or MRI. Only a very small percent of the patients recalled will actually be found to have breast cancer.

DR. SHAVER: Last year, the Breast Center began using a breast-specific gamma imaging (BSGI) program at the Breast Center. This modality serves as an adjunct when you have a suspicious finding, correct?

DR. LANZKOWSKY: Yes, we always begin with digital mammography. In the old days, we sometimes needed to biopsy multiple areas of one or both breasts in order to rule out breast cancer. BSGI uses an injection of an imaging agent called Technetium-99 to help decrease the background and exclude a lot of the non-cancerous masses, narrowing down what we need to biopsy to only the areas that are more likely to be important.

DR. SHAVER: Can you explain what you have found using BSGI?

DR. LANZKOWSKY: We are finding breast cancers. It is of great help in patients with very complex mammograms and ultrasounds which can limit our abilities to see a cancer. There are also certain patients who can't have an MRI, as Adam mentioned, including women with pacemakers.We're the only center in California to have the BSGI, and we're getting referrals from all over Orange County, Riverside County and Northern California for the use of this equipment when a patient can't have any other modality.

DR. SHAVER: BSGI has picked up a number of cancers?

DR. LANZKOWSKY: Yes, and it has also helped us determine when there is not a cancer present while another test may have shown an area to be abnormal. It is more sensitive and more specific than mammography or ultrasound.

DR. SHAVER: I'm interested in the association of ovarian cancer with breast cancer because there seems to be a similar genetic predisposition.

DR. LANZKOWSKY: If a woman has a history of ovarian cancer, then she and her first degree relatives—mother, daughter and sisters—should be watched closely for breast cancer.

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DR. SHAVER: As we transition to discussing lung cancer, there are two more imaging modalities we should examine. PET (positron emission tomography) and CT (computed tomography) scanning.

DR. BROCHERT: PET scans are a nuclear medicine technology that produce a threedimensional image of the body and can be useful for a variety of cancers, including lung, breast and colon. The nuclear agent that is used is a type of glucose or sugar that has been modified. We've learned that cancer cells tend to use more glucose for metabolism than normal cells, so the PET provides a metabolic map of the cancer's location which can help us determine the best treatment. We actually combine the PET and CT so we can combine metabolism with anatomy. In fact, Eisenhower Medical Center was the first in the Coachella Valley to offer this combined technology.

DR. SHAVER: The CT scan is a high resolution anatomic study.

DR. BROCHERT: Yes, it gives us very good resolution, particularly for lung cancer.We can scan the whole chest in a five to seven second breath hold and have plenty of resolution to look for lung cancer.

DR. SHAVER: Lung cancer is the leading cause of cancer-related deaths in both men and women in the United States. Davood, tell us about the International Early Lung Cancer Action Project (I-ELCAP).

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DR. VAFAI: Lung cancer kills more than breast, colon and prostate cancers combined. It accounts for 25 to 28 percent of cancer-related deaths in the United States, so it's a significant cause of mortality. The goal of I-ELCAP is to prove the value of early detection of lung cancer using the CT scan. The study began at Cornell University and Memorial Sloan- Kettering and now is an international study in nine nations with more than 35,000 enrolled patients. Eisenhower has participated for the past five years in the study and is one of only six participating hospitals in California.

DR. SHAVER: What are the criteria for participation in the study?

DR. VAFAI: The criteria are that the patient is at least 50 years old, without any history of cancer and at least a 10-year history of smoking.We also want to know that the person can undergo surgery if we find cancer. Those are the major criteria.

DR. SHAVER: What have you found?

DR. VAFAI: So far, we have been able to show that a CT scan can detect the disease early, meaning stage 1, which is a tumor smaller than three centimeters.With a CT scan, a majority of the time, we are able to detect the disease in the range of about one centimeter. If we treat these early detected lung cancers within one month and do the surgery, the 10-year survival rate is about 90 percent. These results have been published in The New England Journal of Medicine. Historically, the cure rate of the disease is five to 12 percent, so now we are approaching a cure rate of almost 80 to 90 percent.

DR. SHAVER: Why is there still some debate about these results?

DR. VAFAI: Some people are claiming that we are detecting a lot of lung cancers that are slow-growing and that it doesn't matter if we treat them early. In our database, all of the cancers that we have detected by CT scan have been assessed and evaluated by an expert panel on lung pathologies. They are all equal and they are all similar physiologically, and some of them even genetically, to the lung cancers that we see every day. So these cancers are not a slower growing cancer. They are real cancers.

DR. BROCHERT: When you work in the field and find an eight millimeter breast cancer or a seven millimeter lung cancer and the patient is subsequently cured, you can't let go of that feeling, because you know you helped someone. Experts will continue to debate about each type of screening, but if it were my family, I would want them to get screened.

DR. SHAVER: I think everybody agrees in prevention by stopping smoking as the best way to prevent the cancer.

DR. VAFAI: Absolutely. And the CT scan screening modality has huge potential. It would be able to detect coronary disease in a very early stage. It has the potential to detect emphysema in the early stages. So with one modality, you are able to detect a lot of tobacco-related diseases that are the major killers in the Western population.

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