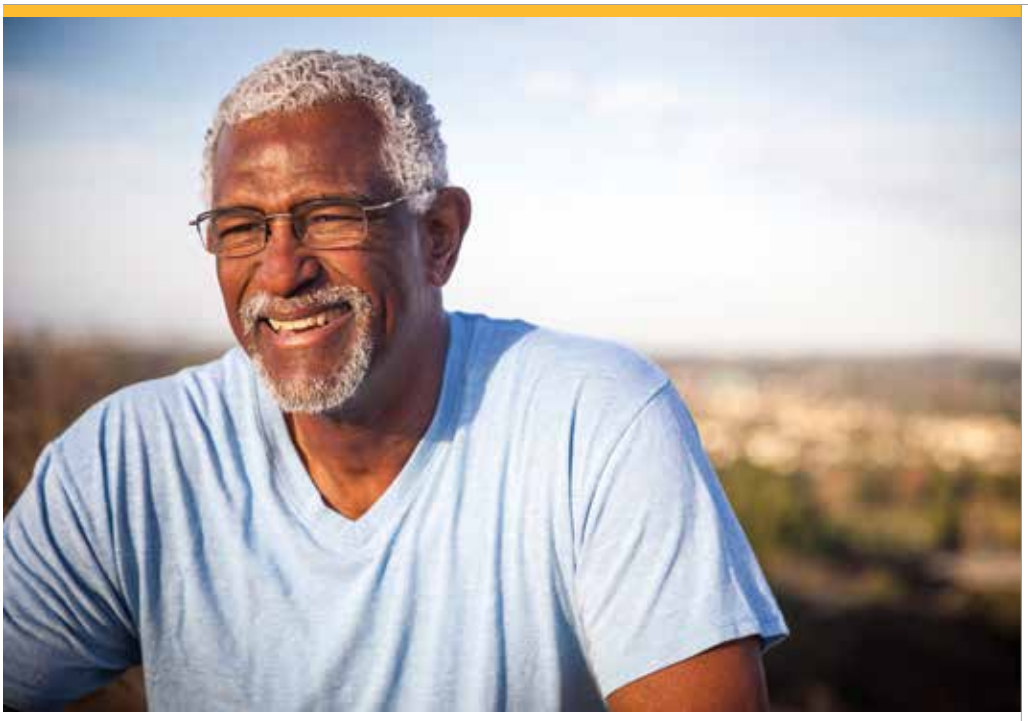
UCLA Health

New imaging test accurately detects prostate-cancer cells throughout the body



There are about 3 million American men currently living with prostate cancer — and 220,000 new cases diagnosed each year — making it the most common cancer affecting this population. Although cure rates are generally very good, detecting cancer cells that have spread or recurred outside the pelvic region has been an area of weakness in caring for prostate-cancer patients.

To address this issue, UCLA is now the first medical center in Southern California — and one of only a handful across the country — to offer 68Ga-PSMA PET/CT imaging, which can detect prostate-cancer cells anywhere in the body more accurately than traditional methods.

About 68Ga-PSMA PET/CT imaging

68Ga-PSMA PET/CT imaging, or PSMA-PET imaging for short, represents a major advance in detecting prostate cancer. First developed in Germany about three years ago, it's been offered in a UCLA nuclear medicine clinic as part of a diagnostic clinical trial since September 2016. Because it isn't approved by the U.S. Food and Drug Administration, this imaging test is not covered by insurance.

PSMA-PET imaging better detects recurrences

Thirty percent of patients treated for prostate cancer — and more than 50 percent in high-risk cases — eventually develop potentially life-threatening recurrences, which are often detected when their prostate-specific antigen levels start rising on routine blood tests.

Unfortunately, standard imaging tests aren't good at determining where cancer cells are located, says Robert E. Reiter, MD, Bing Professor of Urologic Oncology and director of UCLA's prostate cancer program. "For the past 20 years, I've had to tell patients with recurrences that I don't know where the cancer is located," Dr. Reiter says. "We've been blind, basically."

Since PSMA-PET imaging became available at UCLA in September, patients now have a new option that's better at detecting the location of prostate-cancer recurrences. "With this test, cancer cells light up like lightbulbs on a Christmas tree," says Johannes Czernin, MD, chief of the UCLA Ahmanson Translational Imaging Division.

"This test has had a tremendous and immediate impact on prostate-cancer patients," Dr. Reiter adds. "They can really benefit from this."

The PSMA-PET imaging test works by marking an antigen receptor that sits on the surface of every prostate-cancer cell, called PSMA, with a radioactive peptide, Gallium-68. This process allows the cancer cells to be detected wherever they are located, including outside of the pelvic region.

The procedure is similar to other PET/CT scans. The patient is given an intravenous injection of the radioisotope (68Ga), followed an hour later by an intravenous injection of contrast dye for the CT portion of the PET/CT scan. The actual scan time is about 20 minutes. There are no common side effects or significant risks, and the procedure takes a maximum of two hours from start to finish. There are no dietary restrictions prior to the test.

How PSMA-PET compares to current tests

Once rising serum PSA levels are noted on a blood test, doctors often conduct a multiparametric MRI, which can locate cancer cells in the prostate gland. Some also use ultrasound and CT scans to pinpoint where the cancer is located, although both sometimes lack sufficient sensitivity to determine the true extent of the disease.

To detect metastatic disease in bone, lymph nodes or soft tissue, doctors might order various types of bone scans, or acetate or choline PET/CT scans. However, these tests can sometimes miss disease or return false-positive findings. The sodium fluoride PET/CT scan looks for variations in bone structure, which could indicate cancer. But because of its low specificity, it can flag areas where there's arthritis or injury.

The acetate/choline PET/CT scan, on the other hand, uses as its radioactive tracer a precursor of lipids used to build tumor cell membranes that prostate-cancer cells should absorb. But this test lacks sensitivity, and doesn't work well in cases of prostate-cancer recurrence where prostate-specific antigen levels are low.

Guiding treatment decisions

In contrast to the traditional studies, PSMA-PET imaging offers high sensitivity and specificity. Because the test looks specifically for the antigen that sits on prostate-cancer cells, it finds these cancer cells wherever they are, while avoiding false-positive results.

Whereas the unreliable results of traditional tests can lead to unnecessary or insufficient disease treatment and management decisions, PSMA-PET allows doctors to make more informed treatment decisions. While radiation and surgery are typical in localized cases, chemotherapy or hormone therapy might be appropriate in cases where PSMA-PET imaging detects prostate-cancer cells in the bone or lymph nodes.

PSMA-PET imaging allows for more informed care, with likely better outcomes as a result. The UCLA team uses PSMA-PET imaging to identify the site of disease recurrence in patients whose blood PSA levels start rising after initial prostate-cancer therapy. The test is also used to determine the extent of the disease prior to surgery.

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