

How a new imaging tool helps to better stage men with prostate cancer

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Prostate-specific membrane antigen, or PSMA, -targeted PET imaging for prostate cancer has been a breakthrough diagnosis tool in locating prostate cancer tumors for more precise treatment. The new imaging

technique can locate cancer lesions not only in the prostate, but can also track cancer that has spread to other parts of the body that is often missed by current standard-of-care imaging techniques.

The tool uses positron emission tomography scanner to detect a radioactive tracer that is highly effective in finding [prostate cancer](#) lesions throughout the body so that it can be better visualized and more selectively treated.

A paper detailing the method that led to the US Food and Drug Administration approval for the imaging technology, which was led by UCLA and UCSF and their nuclear medicine teams, was recently published in *JAMA Oncology*.

Here senior author Dr. Jeremie Calais, assistant professor of nuclear medicine and theranostics in the department of molecular and medical pharmacology at the David Geffen School of Medicine at UCLA and member of the UCLA Jonsson Comprehensive Cancer Center, discusses the significance of the findings and how PSMA PET imaging will change the landscape of prostate cancer detection and treatment.

What is the main focus of the paper?

The paper is about using the new imaging test PSMA PET/CT for primary staging of prostate cancer before any initial therapy is done. When a patient is diagnosed with prostate cancer that has some pathologic features on the biopsy that indicate some risk of metastasis in the lymph node or the bones, the physician need to know if the cancer has spread out of the prostate or not. PSMA PET/CT is a whole- whole-body imaging modality that can perform a one-time whole body staging with high accuracy for locating and detecting if any metastasis has spread out from the prostate. It's the best imaging modality so far for whole-body staging of prostate cancer.

How is the scan used in the study?

The scan was used in patients at initial staging before surgery. We primarily aimed to evaluate the performance of the scan to detect pelvic lymph node metastasis. The pelvic lymph nodes are the lymph nodes that are in the pelvis, commonly the first site of metastasis outside of the prostate, when the cancer has not spread yet to the bone or other organs. The only real way to know if the cancer is in the pelvic lymph node is to analyze the nodes with a microscope (histopathology) after they have been removed by surgery (lymph node dissection). We evaluated the ability of the scan to detect some pelvic lymph nodes as containing cancer, in comparison to the reference gold standard: the histopathology analysis of the lymph nodes removed by surgery.

What are the key findings?

The first key finding is that at the end, only 277 of the 764 patients who got the scan actually underwent surgery. About 64% of participants actually did a different treatment other than surgery following the scan because the scan showed some disease outside of the prostate and the surgeon felt the treatment was no longer ideal. If you know that the disease has already spread outside the prostate, it's too late to hope for surgery to be curative alone. Physicians and/or patients opted for other types of therapy such as radiation and/or hormonal treatments.

In regards to the main aim of the study, we found that the sensitivity of the scan to detect the pelvic [lymph nodes](#) metastasis was 40%. This means that the test can detect pelvic lymph node disease in 40% of the patients who actually have pelvic lymph node disease. It means that in 60% of patients, lesions are still too small to be detected (micrometastasis). But it is better than any other imaging technique available so far. And the sensitivity would have been much higher if all

764 patients would have undergone surgery because most of the patients of the study who did not go to surgery had big lesions detected by the scan but were not included in this analysis.

One other very important finding was the very high specificity of the test: when a patient did not have pelvic lymph node metastasis, the scan was correctly negative in 95% of the cases. So when you see something positive on the scan, it is very likely prostate cancer and not something else. It is very important for diagnostic tests to make sure that what you see is actually what you're looking for. That's the specificity, and in this study, it's very high, 95%, which is much better than any other tests.

What was unique about the study?

This was an academic collaborative project between UCLA and UCSF that led to an FDA approval, which is a big accomplishment to achieve without industry funding. For an academic team, to go to the FDA, obtain an NDA, and write a paper with 700 patients, it is huge. It was such a great collaborative effort with the urologic oncology and nuclear medicine teams at UCLA and UCSF. I feel very lucky and grateful to work in such environment.

How has the PSMA PET scan changed the field?

The PSMA PET is now part of the National Comprehensive Cancer Network guidelines starting in 2022. The Panel wrote that they "do not feel that conventional imaging is a necessary prerequisite to PSMA-PET and that PSMA-PET can serve as an equally effective, if not more effective front-line imaging tool for these patients," which is great news for patients. Insurance coverage will follow soon. Access to PSMA PET will be widely available and this game-changer technology will ultimately become part of the routine staging of [prostate cancer](#) patients. Like

doing a PSA test, I anticipate in a near future that physicians will routinely require a PSMA PET scan before making a treatment plan.

More information: Thomas A. Hope et al, Diagnostic Accuracy of 68Ga-PSMA-11 PET for Pelvic Nodal Metastasis Detection Prior to Radical Prostatectomy and Pelvic Lymph Node Dissection, *JAMA Oncology* (2021). [DOI: 10.1001/jamaoncol.2021.3771](https://doi.org/10.1001/jamaoncol.2021.3771)

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