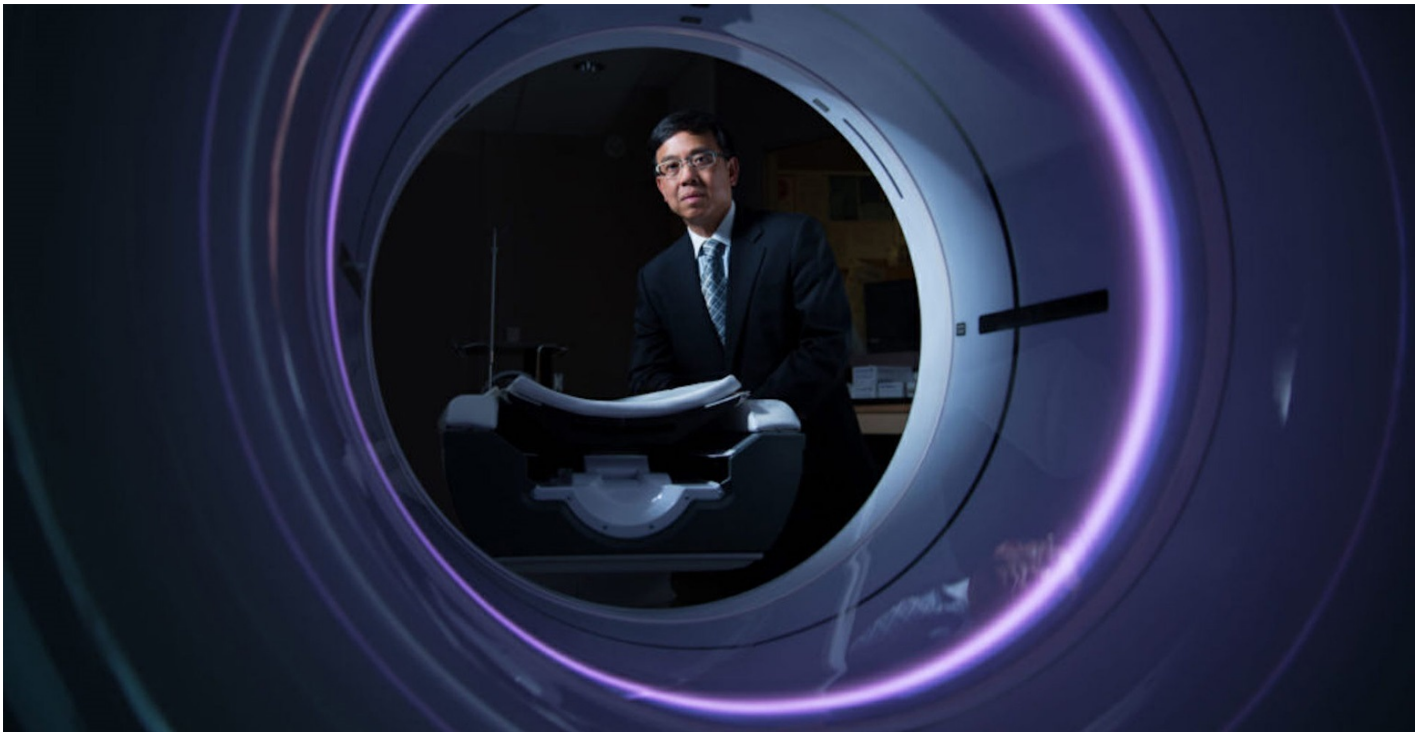
New Imaging Technique An Early Indicator Of Treatment Response



We cannot survive without oxygen. The hemoglobin in our blood transports oxygen from our lungs to every organ throughout our body. Interruption of blood flow can lead to death of oxygen-starved tissue. Blood flow, or tissue perfusion, is measured using MRI or CT-imaging methods. For CT-perfusion imaging, the movement of a contrast agent over time is captured in a series of CT-images, and software is used to translate the imaging information into measurements of blood flow parameters for each target tissue.

Dr. Ting-Yim Lee, a professor of medical biophysics at Western University and a Lawson and Robarts imaging scientist, is an expert in the visualization of tissue perfusion through imaging methods. His lab pioneered the methods and software used for CT-perfusion imaging to measure blood flow in various tissues including the brain, tumors and the heart.

For example, CT-perfusion imaging of the brain is used during stroke patient diagnosis to measure the size, location, and level of blood flow (perfusion) in the tissues impacted by the stroke. Clinical treatment decisions are then based on the perfusion parameters. Patients with smaller ischemic cores and suitable perfusion of the surrounding tissue are ideal candidates for mechanical thrombectomy, a treatment that has transformed stroke management. In tumor applications, Lee co-led an ambitious, multi-site, 120-patient clinical study of CT-perfusion with the Gynecologic Oncology Group (GOG) and the American College of Radiology Imaging Network (ACRIN) – both American non-profit organizations that administer major research studies funded by the National Cancer Institute.

The parent Phase III clinical study compared the current standard of care with a new treatment method for advanced

ovarian cancer, while the ACRIN-6695 sub-study measured CT-perfusion as a biomarker of treatment efficacy in advanced ovarian cancer and showed that CT-perfusion imaging may be used as an early diagnostic indicator of treatment response, because decrease in blood flow in responding tumor was observed as early as four weeks post-treatment.

“We designed this scanning method, the first cancer multi-center trial using CT Perfusion,” Lee said. “We also used a standardized protocol and standardized analysis method developed here. This was a big undertaking with over 20 sites in the U.S., and all the images were sent to our lab for analysis.”

Lee has a long-term research relationship with GE Healthcare, who has licensed the technology from the University through WORLDiscoveries in London, ON, the technology transfer office for Western, Lawson, and Robarts, and who has managed the technology since it was disclosed almost two decades ago. The software has been continuously developed and improved over the years and GE provides it with their scanners.

“The current version of software covers the whole body except the lungs,” Lee said.

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