

# World first trial to improve prostate cancer care

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Researchers and clinicians from the University of Sydney and the Northern Sydney Cancer Centre are leading a world first clinical trial using a tracking system to improve prostate cancer radiotherapy treatment.

The multileaf collimator (MLC) tracking system uses the Calypso system, a GPS-like device to track the position of the prostate to continuously target the tumour with sub-millimetre accuracy as it moves during therapy.

A prostate can move up to 1.5 centimetres during a radiation treatment session and in current practice the tumour is positioned before treatment, but this motion is not monitored or corrected for during treatment.

MLC is a computer-controlled device with numerous narrow slats or leaves that can be moved in and out to create apertures of different sizes. This tool is used to shape and reshape the radiotherapy treatment beam during treatment to match the three-dimensional shape of the area being targeted.

In addition to shaping the treatment beam, the MLC responds to signals from a tiny set of transponders implanted into the prostate to follow the tumour as it moves.

The trial's lead clinician Dr Tom Eade said the use of MLC tracking will potentially improve the accuracy of radiation delivery and reduce the

impact on surrounding healthy tissue and sensitive structures such as the rectum and bladder.

"Royal North Shore Hospital has a history of implementing some of the most advanced radiotherapy in Australia and this is reflected in our excellent patient outcomes at the Northern Sydney Cancer Centre," he said.

"But today is the first time we will follow the tumour continuously during treatment. This breakthrough may potentially change the paradigm of [prostate cancer](#) treatments, opening the opportunity for patients to have their cancer cured with radiation in just 1-2 weeks of treatment with very low side effects," said Dr Eade.

University of Sydney Medical School's Professor Paul Keall said having a radiation beam continuously target the prostate means that the prostate will receive more than 98 per cent of the radiation dose planned.

"We are recording the estimated treatment improvements with MLC tracking, as well as recording the actual patient outcomes.

"Based on prior data we estimate that tumour dose misses, which can be up to 30 per cent in current practice, can be reduced to below two per cent," Professor Keall said.

The revolutionary use of MLC tracking also has the potential to reduce prostate cancer radiation therapy from an eight week program to just five days, as the greater level of accuracy could make it possible to safely deliver higher doses across fewer treatment sessions.

"This shorter [treatment](#) course is better for patients and more cost-efficient," Dr Eade said.

Prostate cancer is the most common cancer diagnosed in Australia and the third most common cause of cancer death. It is more common in older men, with 85 per cent of cases diagnosed in men over 65 years of age.

The trial is the culmination of a 14-year research project initially started by Professor Keall. It is being supported by Varian Medical Systems to undertake the study at the Northern Sydney Cancer Centre at Royal North Shore Hospital.

Professor Keall said the team hoped the MLC tracking technology could extend to other cancers such as lung, pancreas and liver tumours in the future.

Thirty prostate [cancer](#) patients will be the first to benefit from MLC tracking technology during this current clinical trial.

Those interested in participating in the trial can call the Northern Sydney Cancer Centre on 02 9463 1199.

Provided by University of Sydney

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