Media Release

Date: EMBARGOED 4pm 17 December 2015

LIGHT SABR NEDEST WEAPON IN BATTLE WITH LUNG CANCER

A world-first clinical trial using a real-time tumour tracking system to improve lung cancer radiotherapy treatment is being led by researchers and clinicians from the Northern Sydney Cancer Centre and the University of Sydney.

The new program LIGHT SABR (Lung Intensity Guided Hypofractionated tumor Tracking for Stereotactic Ablative Body Radiotherapy) is really bringing the future to patients who are battling against lung tumors today.

The multileaf collimator (MLC) tracking system uses Varian’s Calypso system, a GPS-like device to track the position of the lung to continuously target the tumour with sub-millimetre accuracy as it moves during therapy. Previously used for the first time in prostate cancer patients at Royal North Shore Hospital in November 2013, the treatment has now advanced for use in lung cancer patients.

Patients will be implanted with three miniature GPS-like tracking beacons (3 x 8mm) beside their lung tumours via bronchoscopy. These beacons move with the tumour as the patient breathes in and out. Radiation therapy is then directed via signals transmitted by the beacon and delivered more precisely to the tumour in the lung, as the beacon detects, in real-time, the movement of the lung tumour as the patient breathes. As the radiation is focused on the lung tumour as it moves, and the radiation dose is adjusted accordingly, there is less radiation exposure to the healthy parts of the lung around the tumour.

Royal North Shore Hospital is the first hospital in Australia to use this real-time tracking system with lung cancer patients, and is the first institution in the world to use radiation field tracking, using software developed at the University of Sydney.

Additionally, for the first time, patients will also be able to watch a monitor to trace their breathing while having radiation therapy. This will help calm their breathing pace and allow the software to better predict the location of the lung tumour for radiation.

Mr Ashley Bullen, is one of the first patients to receive the new treatment. He described the process as “feeling like I’m going to the beach, lying down on a towel and having a half an hour kip. So far it’s all been really easy to take.”

Mr Bullen was diagnosed with a lung tumour earlier this year, after a routine PET scan following a previous cancer diagnosis of bowel cancer. “Last time I was treated with chemotherapy, I had to take it in the tablets and I noticed some side-effects. With this treatment I have had none, other than feeling a little tired”.

“I am well enough to drive myself in to the hospital for each treatment and I have kept working throughout” said the 67 year old grandfather of six.

The trial’s lead clinician Clinical Associate Professor Tom Eade (Senior Staff Specialist in Radiation Oncology at the Northern Sydney Cancer Centre) said the new treatment will enable more targeted treatment for lung cancer.

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One of the existing issues for lung cancer radiotherapy is respiratory motion, as the tumours move considerably with breathing. Normally, to ensure the tumour is targeted with radiotherapy, we increase the amount of lung tissue targeted for radiation, to compensate for the breathing motion.

By using this new tumour tracking technology, we can reduce the size of the radiation field in the lung by up to 50 per cent, while delivering a shorter, more accurate course of radiotherapy. This is safer for the patient, as we are decreasing the amount of healthy lung exposed unnecessarily to radiation,” Associate Professor Eade said.

Professor Paul Keall, Director of the Radiation Physics Laboratory at the University of Sydney, has been leading the development of this technology for over 15 years. “This treatment milestone represents the culmination of a massive effort of scientists and clinicians across three continents. We hope that our findings from this trial will enable more hospitals in Australia, and around the world, to provide this treatment for lung cancer patients, or any patients being treated for cancer in the thorax or abdomen.”

“By enabling access to real-time tumour tracking on standard cancer radiotherapy systems, we can reduce the need for new or additional costly equipment, while also reducing wait times by introducing short course treatments. This will particularly benefit rural and remote Australians by providing a more convenient choice of treatment,” said Professor Keall.

Dr Jeremy Booth, Director of Medical Physics at Northern Sydney Cancer Centre, said that previously, radiotherapy research as almost exclusively concentrated on Stage 1 lung cancer. “This world first clinical trial will ultimately lead to improved radiotherapy for all lung cancer by demonstrating that we can use this method to deliver higher accuracy treatment, while affecting less healthy lung. This trial will keep Australia at the forefront of lung cancer treatment.”

Dr Booth also believes that as a result of this trial, lung tumour tracking will become more commonplace in standard radiotherapy treatment units around the world, as the existing hardware requires only new software to enable real-time tracking.

“Upon completion of this trial, we will be able to prove the effectiveness of lung tumour tracking. We can then unleash the overdue potential of this technology across thoracic and abdominal cancers where radiotherapy is affected by respiratory motion. By targeting only the tumour with radiation, while increasing the radiation dosage, shortening the treatment time and reducing toxicity to the patient, we are improving the patient’s quality of life. We also believe that 50 per cent more patients would be eligible for this type of radiotherapy,” continued Dr Booth.

The radiation therapy will also capture a 4D image of the tumour to calculate the intersection of the radiation beam, to provide a match for future treatments. Analysis of these images also will help the clinicians and researchers to determine a future way to deliver this type of radiation therapy without the need for implanted beacons. Called ‘markerless tracking’, this will enable clinicians to conduct radiotherapy on tumours currently not accessible for beacon implants, therefore avoiding unnecessary risk to the patient from the implantation procedure, and saving valuable time before the patient's first treatment.

Lung cancer is the leading cause of death worldwide, and in Australia, more than 10,200 new patients are diagnosed every year. The five year survival rate for lung cancer in Australia is 14 per cent.

The trial is supported by Varian Medical Systems to undertake the study at the Northern Sydney Cancer Centre at Royal North Shore Hospital.

Twenty patients with lung tumours will be the first to benefit during this current clinical trial. Those interested in participating in the trial can call the Northern Sydney Cancer Centre on 9463 1300 to learn more about the eligibility criteria for the trial.

ENDS

Photo Opportunity:

Day: Thursday 17 December Time: 2pm

Meeting Point: Meet at the reception desk in the main hospital building
Place: Royal North Shore Hospital, radiation oncology unit

Interviewees: Professor Paul Keall, Dr Jeremy Booth, Mr Ashley Bullen and his treating Radiation Oncologist Dr Carol Haddad

Glossary:
- **Hypofractionated** means less fractions/daily treatments
- **Stereotactic** means high precision
- **Ablative** means high dose

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