

Tracer could indicate radiation benefit to patient

June 3 2014, by Chris Thomas



The study aims to use robust methodology to quantify how beneficial radiation is for patients, and how long they feel better after receiving it. Credit: Urology San Antonio

A world-first radiotherapy treatment trial by University of WA researchers could have a major impact on the quality of life for mesothelioma patients.

Funded by an almost \$100,000 Cancer Council WA grant, the research

team is exploring why some [patients](#) respond to radiotherapy treatment while others don't, as well as developing tests to predict whether patients will respond to avoid people being treated unnecessarily.

Lead researcher Professor Anna Nowak says there have been several retrospective studies and case series that suggest radiotherapy shrinks tumour and improves pain—but only as measured by clinicians.

"No previous study has given a uniform dose of radiotherapy and used patient-rated measures such as pain scores, pain medication doses and quality of life questionnaires as recorded by the patient to quantify the benefits patients actually experience," she says.

"We know there can be differences between seeing a tumour shrink on scans and whether the patient actually feels better after treatment.

"Nobody has previously used robust methodology to quantify what the magnitude of benefit is, what proportion of patients feel better and how long they feel better for."

While radiotherapy is widely used in mesothelioma treatment, there are no known predictors of responsiveness.

But when used for treating other cancers, measuring the [hypoxia](#) (low oxygen levels in a tumour) can give an indication of how well patients might respond.

Measuring tumour oxygen to gauge radiation response

Professor Nowak's team plans to use an imaging technique to examine hypoxia levels within tumours.

"Radiotherapy needs an oxygenated environment to cause cell death in cancers through DNA damage," she says.

"F-Misonidazole, or F-MISO, is a radioactively labelled tracer which is injected into the patient about two hours before a PET [[positron emission tomography](#)] scan.

"In hypoxic cells, F-MISO goes into the cell and remains trapped because there is no oxygen to regenerate it.

"Our hypothesis is the tumours with the strongest uptake of F-MISO [the most hypoxia] will be those in which patients derive less benefit—less reduction in pain and medication, less improvement in quality of life and less tumour shrinkage on CT scans after radiotherapy."

If F-MISO scans can predict response to radiotherapy, Professor Nowak says it could become a standard test before recommending radiotherapy to patients, allowing them to be better informed about the likelihood of its benefit.

And if hypoxia proves to be a predictor of poor response to [radiotherapy](#), strategies to reverse or improve hypoxia could be studied.

"We are already testing some of these in mice," Profe Nowak says.

"Simple possible strategies may even include blood transfusions, high-flow oxygen or medications currently used to improve blood flow to the heart."

Provided by Science Network WA

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