World class cancer research

“Thanks to medical research, people with cancer now have more treatment options.”

Professor Anatoly Rozenfeld

Just about all of us know someone who has cancer, or who had cancer. Thankfully, treatment has come a long way over the years and many more people now live to tell the tale. That said, cancer is rapidly becoming the biggest single cause of mortality this century.

Medical research holds the key to improving survival rates. Academic and clinical researchers in universities, hospitals, private clinics and research institutes all over the world are working to continually improve the methods of diagnosis and treatment currently available.

People tend to think of medical research as something going on in big institutions overseas, but world-class cancer research is going on right here in Wollongong. One area in which significant progress is being made is in improving treatment options for men diagnosed with prostate cancer.

In Australia, around 18,700 new cases of prostate cancer are diagnosed every year and close to 3000 men die from this disease. This is equal to the number of women who die from breast cancer.

In the past, men with prostate cancer had little choice but to have surgery that sometimes had devastating effects on the functioning of organs nearby to the prostate, with impotency and incontinence among the possible consequences.

These days, some very effective high-tech options are available that use radiation to kill the cancer. These include ‘image guided radiotherapy’ (IGRT), ‘intensity modulated radiotherapy’ (IMRT) and ‘volumetric-modulated arc therapy’ (VMAT) – three techniques that allow radioactive beams to target the prostate and spare the surrounding tissues.

Two other options are ‘permanent implant brachytherapy’, in which radiation is delivered via radioactive seeds inside the prostate, and ‘high dose brachytherapy’, in which a radioactive source is temporarily placed in the prostate.

A great advantage of these high-tech options is that they have a very low risk of unwanted side effects due to sophisticated quality assurance of treatment delivery. This is very reassuring for men who need treatment for prostate cancer but are afraid of the potential consequences.

The quality of radiation-based therapies is continually improving as a result of work at research centres such as the University of Wollongong's Centre for Medical Radiation Physics (CMRP). Our research here involves collaboration with institutions in many other countries – such as the USA, UK and Ukraine – but it has been a local collaboration that has led to our latest achievement.

Working with clinicians and medical physicists at the Illawarra Cancer Care Centre, we have developed a new detector (called the 'dose magnifying glass') capable of measuring radiation doses much more precisely than ever before. This allows the radiotherapy delivered to patients to be better controlled.

The technology will not only improve the quality of radiotherapy for prostate cancer, but is likely to have many other applications as well. Publication of this news last month by World Medical Physics Web sparked an immediate response from international companies interested in commercialising the new instrument.

This research forms part of the 'Cancer Continuum' theme of the Illawarra Health and Medical Research Institute (IHMRI), an organisation set up to help coordinate the research efforts of health and medical professionals throughout the region.

The ‘dose magnifying glass’ project is a great example of what can be achieved when scientists and clinicians work together and I am sure there will be many more such advances to come. All of us can be proud of the contribution the Illawarra is making to the international effort to improve the survival rate of prostate and other cancers.

Professor Anatoly Rozenfeld is Director of the Centre for Medical Radiation Physics at the University of Wollongong and a researcher in the ‘Cancer Continuum’ theme