

Nuclear medicine puts Olympian back in action.

The Power of Possibilities

Emma Robinson's dream of an Olympic medal at the Sydney Olympic Summer Games was dealt a devastating blow in 1999: A routine check-up revealed she had thyroid cancer. "It was pretty surprising because there was no indication I was ill," she says. "I was shocked, mad, and scared."

Just over a year later, Emma was beaming from the podium with a Bronze medal strung around her neck. A combination of nuclear medicine and surgery had restored her health, and put her back on track to becoming an Olympian. I was really pleased to have received the treatment I did," she says. "I felt completely comfortable with the nuclear medicine part because it's known to work and it's effective."

And Emma is not alone. Thousands of Canadians are treated with radioactive iodine for thyroid diseases. Until recently, though nuclear medicine as a treatment was limited to thyroid illnesses. But thanks to recent breakthroughs, the power of nuclear medicine is poised to be harnessed for treating a wide variety of cancers – and that means faster, less invasive treatment with fewer side-effects. As Emma, now doing her medical residency in Toronto, puts it, "The idea of nuclear medicine is very attractive because it's a way to target only the cancer cells and leave everything else as viable and healthy as possible."

To understand how nuclear medicine works as a treatment, it's helpful to begin with another thyroid condition called Grave's disease that's regularly controlled successfully with radiation.

Grave's disease causes your thyroid – which regulates your body's metabolism, muscle function, and energy – to go into overdrive. Your heart rate increases, you become anxious, have trouble sleeping, lose weight, and your eyes may become irritated.

The most common way to treat Grave's disease is with radioactive iodine. The reason? Iodine naturally concentrates in the thyroid. (Iodine is essential for the thyroid to function properly, which is why table salt is "iodized" by having iodine added to it.) The iodine then delivers a measured amount of radiation directly at its target – the thyroid tissue. By decreasing the thyroid's size, its activity can be scaled back, and the symptoms of the disease controlled.

Could radioisotopes, which naturally target specific areas of the body, be harnessed to treat other diseases? The challenge has been to find a way to do so, deliver sufficient radiation to the specific diseased cells and halt a disease without also hurting healthy cells in the process.

"It's no surprise that patients and doctors alike are excited about the potential of nuclear medicine"

Iain Trevena, Senior Vice President, Nuclear Medicine, MDS Nordion

But researchers have now come up with new drugs to do just that. These remarkable "smart" drugs combine molecules, such as antibodies, that zero in on diseased cells with radioactivity, a process called radioimmunotherapy. The antibodies carry the radioactive payload to the target or the diseased cells, where they destroy them with minimal damage to healthy cells. "This allows us to treat things that we might not otherwise be able to treat," says Dr. Al Driedger, Acting Chief of Nuclear Medicine, London Health Centre, London, Ontario.

Radioimmunotherapy also

requires fewer and shorter visits to a health centre because the irradiation treatment is very localized", notes Dr. Driedger. "It's no surprise that patients and

doctors alike are excited about the potential of nuclear medicine", says Iain Trevena, Senior Vice President of Nuclear Medicine with MDS Nordion,

an Ottawa-based company that supplies the world with radioisotopes. "Radioimmunotherapy is an emerging and exciting field of medicine that offers hope

and treatment to seriously ill patients."

For more information visit The Power of Possibilities at globeandmail.com



nuclear medicine is helping millions

Nuclear Energy. The Power of Possibilities.

To find out more about the Canadian nuclear industry and its benefits to air quality, health and the environment

visit www.cna.ca



**Canadian Nuclear Association
Association nucléaire canadienne**

1610 – 130 Albert St. Ottawa Ontario K1P 5G4 Tel: 613-237-4262 Fax: 613-237-0989