

Building A Safer Isotope

BC Scientists Solve Health-Care Dilemma

University of British Columbia



Hundreds of thousands of people around the globe have benefited from something they've never heard of: technetium-99m. Tc-99m, as it's known in scientific circles, is the world's most-popular diagnostic imaging isotope.

When injected into a patient, isotopes allow medical specialists to closely examine target areas noninvasively, with special equipment. Tc-99m is used in more than 80 percent of all nuclear medicine procedures—some 30 million times a year—to diagnose cancer, Parkinson's and other serious conditions.

Historically, valuable medical isotopes like Tc-99m have been produced worldwide at nuclear reactors such as Ontario's Chalk River. But a series of outages in recent years at key, often aging reactors led to a shortage of Tc-99m and significant health-care disruptions.

“ *The Chalk River reactor shut down in March 2018, after more than 60 years online, leaving Canada without a major source of medical isotopes. Chalk River had produced 40 percent of the world's supply of Tc-99m.* ”

Since 2009 the search has been on to bypass nuclear reactors and develop new ways to produce radioisotopes. TRIUMF, a renowned subatomic physics laboratory based at the University of British Columbia, headed a partnership that eventually came up with breakthrough technology.

The method uses cyclotrons, a type of particle accelerator found worldwide in hospitals, clinics and radiopharmacies that provide medical imaging. This means that

Tc-99m and other radioisotopes such as copper-64 and gallium-68 can now be produced locally as needed. And by employing nonradioactive elements, the cyclotron process eliminates the use of enriched uranium and results in no long-term radioactive waste.

This technology is “a viable alternative that allows for a safe, reliable and environmentally sound supply of a critical medical isotope,” said Paul Schaffer, CEO of ARTMS Products Inc., a Vancouver-based company launched by the TRIUMF consortium to market the technology worldwide.

ARTMS, recipient of the BC Tech Association’s 2017 award for “Most Promising Pre-Commercial Technology,” has now taken a big next step on the world stage, partnering with U.K.-based Alliance Medical, the leading independent provider of diagnostic imaging services across Europe.

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