isotopes for HOPE

Canada’s 2030 Promise

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MESSAGE FROM OUR CHAIR

An introduction to Isotopes for Hope

For nearly a century, Canada has been at the forefront of medical isotope development and use, providing a new sense of hope to patients around the world. Leveraging the power of our nuclear sector, our top-tier research and healthcare capacity, and decades of world-class expertise, Canada continues to emerge as the leader in the global fight against cancer. Looking forward, Canada faces a significant opportunity to build on this proud past to shape a bright future for the patients of tomorrow.

By doubling our production of isotopes by 2030, and with the right policy support from governments at all levels, Canada will be well-positioned to seize this growing opportunity.

That's why the Canadian Nuclear Isotope Council (CNIC) launched our Isotopes for Hope campaign in March 2023, putting forward our ambitious vision to double Canada's production of medical isotopes by 2030.

Phase 1 of our campaign began with the release of our landmark report, ***Isotopes for Hope: Canadian Leadership Needed Now More Than Ever,*** which identified key opportunities for Canada to take our leadership to the next level. We brought these key recommendations to the Canadian government as part of our first-ever federal Hill Day in 2023, advocating on behalf of our sector across political lines and departments.

Five months later, **Phase 2** of our campaign saw the release of ***Isotopes for Hope: Update on Recommendations***. The report outlined the progress achieved since Phase 1, identified the focus areas and priorities for 2024. We continued our advocacy on these recommendations with our second federal Hill Day, as well as our first Ontario-focused advocacy day in 2024. Phase 2 also saw the launch of our **Isotopes for Hope Podcast series**, which shares unique stories from across the sector about the importance of Canadian-made medical isotopes.

Now in 2025, the CNIC and its members are rising to the challenge to position Canada as a global isotope superpower. With this new report, the CNIC officially launches **Phase 3** of our **Isotopes for Hope** campaign. Canada has already made significant strides towards our goal of doubling Canadian isotope production, but there is more work to be done. Phase 3 also celebrates the creation of the CNIC's new **National Oncologist and Clinical Scientist Network** to support the future work of the Isotopes for Hope campaign, which will allow us to better align with and leverage Canada's leading physicians, academics, and health experts.

As this report shows, the global isotope market is now estimated to reach $42 billion US by 2033. By doubling our production of isotopes by 2030, and with the right policy support from governments at all levels, Canada will be well-positioned to seize this growing opportunity. Now is the time for a renewed commitment to improving patient outcomes and advancing new treatments.

James Scongack
Chair, Canadian Nuclear Isotope Council

Progressing towards our goal of doubling isotope production in Canada by 2030

When the Isotopes for Hope campaign launched in 2023, Canada's isotope sector was already experiencing significant growth. Since then, this momentum has only accelerated, with increasing investment and expansion across the supply chain all driving towards our goal of doubling isotope production by 2030.

isotopes for HOPE

Through the initial launch of the Isotopes for Hope campaign, the CNIC sets a goal to double the current production capacity of isotopes by 2030.

JULY 2023

Through Prairies Economic Development Canada (PrairiesCan) funding, the Sylvia Fedoruk Canadian Centre for Nuclear Innovation (Fedoruk Centre) accelerates the development of new radioisotope products, establishing Saskatchewan's capabilities to manufacture Gallium-68 (Ga-68)-Chloride, Sodium-Fluoride-18, and Fluorine-18 (F-18)-PSMA agents.

2023-2024

Through its Canadian Nuclear Research Initiative - Health Program, CNL collaborates with Jubilant Radiopharma, Repare Therapeutics, and Defence Therapeutics on individual research projects, working to develop targeted radiopharmaceuticals for oncology, targeted alpha therapy and alpha radiopharmaceuticals, and medical isotopes.

FEBRUARY 2023

Ontario Power Generation (OPG), Laurentis Energy Partners, and BWXT Medical begin irradiating and harvesting Molybdenum-99 (Mo-99).

MARCH 2023

McMaster University, Terumo and AtomVie Global Radiopharma (AtomVie) partner to produce two innovative Holmium-166 medical devices. McMaster has built a new hot cell lab to enable processing and dispensing.

JULY 2023

Canadian Nuclear Laboratories (CNL), the Fedoruk Centre and Isotope Technologies Munich (ITM) announce plans to significantly increase the global supply of Actinium-225 (Ac-225).

SEPTEMBER 2023

BC Cancer and the Government of British Columbia break ground at the site of a new cancer centre in Surrey, which will have the capacity for up to six linear accelerators and a cyclotron.

OCTOBER 2023

CNL and ITM form Actineer to increase Canada's supply of Ac-225, with production beginning at the Saskatchewan Cyclotron Facility. The facility now supplies over 30 times the previous level of production of Ac-225.

NOVEMBER 2023

AtkinsRéalis announces the CANDU MONARK reactor, which will have the ability to produce medical isotopes through unique purpose-built ports.

APRIL 2024

Telix Pharmaceuticals (Telix) acquires Burnaby-based ARTMS, integrating Telix's global pharmaceutical pipeline with ARTMS' cyclotron-based isotope production system, securing reliable access and domestic production of isotopes such as Ga-68, Zirconium-89, and Copper-65.

APRIL 2024

The Government of British Columbia announces a new cancer centre in Nanaimo scheduled to open in 2028, which will house a linear accelerator.

APRIL 2024

McMaster University's cyclotron facility commissions a novel automated handling system for liquid target production, enabling expanded research into Technetium-94m production with King's College London.

MAY 2024

Atomic Energy of Canada Limited (AECL), CNL, and AtkinsRéalis explore opportunities to collaborate on Deuterium Oxide (heavy water) production.

JUNE 2024

BWXT Medical becomes the first commercial company to file an Ac-225 Drug Master File with the U.S. Food and Drug Administration (FDA) and soon updates this filing to expand drug scalability.

JULY 2024

BWXT Medical's Ac-225, produced using TRIUMF's cyclotrons, begins to be used in clinical trials worldwide including trials performed in Montreal, Québec.

OCTOBER 2024

Actineer achieves its first irradiation milestone and successfully produces Ac-225 by irradiating Radium-226 in a cyclotron.

OCTOBER 2024

Health Canada expands the approved use of Telix's diagnostic agent, Illuccix, to support patient selection for Lutetium-177 (Lu-177) targeted radionuclide therapy. This approval enhances the clinical applications of Illuccix, which is distributed by Isologic Innovative Radiopharmaceuticals, reaching 265 hospitals and clinics across Canada.

NOVEMBER 2024

The Government of Ontario announces the construction of a new hot cell facility located near the Bruce Power facility, increasing Canada's domestic processing capabilities for Lu-177.

DECEMBER 2024

BWXT Medical begins developing alternate Ac-225 production methods to further expand production capabilities.

JANUARY 2025

OPG's Darlington Nuclear Generating Station (Unit 1) begins producing low specific activity Cobalt-60 (Co-60) for sterilization purposes.

JANUARY 2025

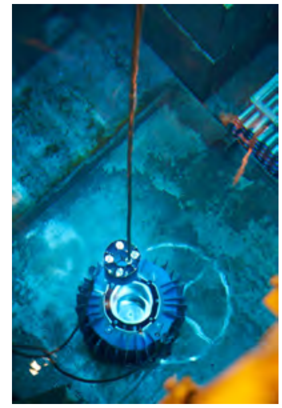
Kinectrics signs an agreement with Isotopia to supply Gadolinium-160 for Isotopia's production of Terbium-161 (Tb-161).

JANUARY 2025

Kinectrics begins production of stable enriched Ytterbium-167 (Yb-167) for Lu-177 at a new stable isotope production facility.

FEBRUARY 2025

Bruce Power harvests its largest amount of Co-60 to-date during its Unit 5 planned outage and completed upgrades to Unit 5 that will allow for greater Co-60 output for both sterilization and cancer therapy uses.



FEBRUARY 2025

isoSolutions, in collaboration with iThemba LABS, successfully register their Ga-68 generator with Health Canada.

APRIL 2025

Alberta's Ministry of Infrastructure submits the facility design for the new Calgary Radiopharmaceutical Centre to the CNSC. The facility will be home to Alberta's third and Calgary's first cyclotron.

MAY 2025

OPG receives a licence amendment from the CNSC to explore commercial production of Yttrium-90 (to begin in 2026) and Lu-177 (to begin in 2027).

JULY 2025

CNL announces that its Chalk River Laboratory is the first GLP-certified laboratory in Canada to offer pre-clinical radiopharmaceutical studies.

AUGUST 2025

With support from the federal government, Bruce Power announces a second Isotope Production System to double its Lu-177 production capacity.

SEPTEMBER 2025

The Ontario government invests in the McMaster Nuclear Reactor to support expanded 24/7 operations, which will increase McMaster's production capabilities by nearly 20% to supply enough isotopes for up to 84,000 treatments every year with Iodine-125.

2025

Iotron Medical continues to deliver on its five-year commitment as the world's first and only private sector commercial supply of Copper-67, with plans to expand production further to support North American and global clinical trials.

2025

TMC group continues to increase production of stable enriched Yb-176 by six times since 2023, supported by a 500% increase in talent and an expanded 30,000 sq ft production floor.

Canada’s ever-expanding isotope ecosystem

Since 2023, the landscape of the Canadian isotope ecosystem has expanded to include new and growing patient access and public funding for promising radiopharmaceuticals, steadily increasing government support, and new national and regional initiatives that promote innovation.

INCREASING PATIENT ACCESS TO RADIOLIGAND THERAPIES IN CANADA

Since the launch of the Isotopes for Hope campaign, access to radiotherapeutics for patients in Canada and worldwide has been steadily increasing. Most recently in December 2024, Ontario became the first province to administer a publicly funded dose of Pluvicto, for the treatment of metastatic prostate cancer, soon followed by Québec, British Columbia, Saskatchewan, Alberta, and Nova Scotia. Now, patients in several provinces across the country have access to two critical Lu-177-based targeted radioligand therapies, Pluvicto and Lutathera. Health Canada has also approved Ga-68 Illuccix in 2022, which is the essential first step to diagnose and identify which patients are eligible for Pluvicto. In the years to come, we will work to ensure more drugs and devices can be accessed by patients across the country.

Since December 2024, Canada’s hospitals have supported the delivery of radioligand therapy to over 1000 patients across Canada.

STEADY GOVERNMENT SUPPORT AND LEADERSHIP

Governments at all levels continue to play a role in supporting growth, through targeted funding, policy support, and sector awareness.

Federal investment to advance innovation

In 2023, the Government of Canada responded to an ask in the Isotopes for Hope report and announced a $35 million CAD investment through the Strategic Innovation Fund (SIF) to create the Canadian Medical Isotope Ecosystem (CMIE), matched by private sector investment, for a total of $80 million CAD in support of this initiative.

The CMIE provided targeted investments across four major shovel-ready projects. Through its Development Fund, the CMIE has also invested nearly $5 million CAD in promising startups and research projects to support clinical trials, isotope processing technology, and supply chain expansions. The CMIE will contribute to Canada's economy, creating nearly 500 highly skilled jobs in a range of sectors across the country.

Ontario's cross-sectoral, government-driven approach to growth

Following advocacy through the Isotopes for Hope campaign calling on governments to form isotope advisory groups that leverage Canada's homegrown expertise, Ontario's Minister of Energy and Mines, Hon. Stephen Lecce, announced the launch of a new isotope advisory council, the Nuclear Isotope Innovation Council of Ontario (NIICO) in July 2025.

Led by the CNIC's Chair James Scongack and ten leaders from across the sector, including isotope producers, academics, Indigenous leadership, and physicians, the NIICO will assist the Government of Ontario in meeting its new target of doubling isotope production in the province by 2030, officially committing to the Isotopes for Hope goal.

Local initiatives to support regional innovation

The Isotopes for Hope campaign also spurred the creation of new regional initiatives aiming to strengthen isotope supply chains, spur regional innovation and increased investment, and connect with the local healthcare community. This includes the Southwestern Ontario Isotope Council (SOIC), established in June 2023 and co-led by the City of Owen Sound and the Nuclear Innovation Institute, as well as the Central and Eastern Ontario Isotope Alliance formed in May 2024 and co-led by the Municipality of Clarington and Laurentis Energy Partners.

Recently in October 2025, leadership from the SOIC enabled a resolution from the Western Ontario Wardens' Caucus (WOWC) that formally endorses the growth and expansion of the region's medical isotope ecosystem and supports the Government of Ontario's goal of doubling isotope production by 2030.

"Medical isotopes are the core building blocks of modern radiopharmaceuticals - our latest class of tool against cancer. Purposefully designed, they seek out cancer cells at a molecular level and deposit radiation right where it is needed. Already saving lives, their future potential is enormous. Recognizing this potential, the Isotopes for Hope campaign will galvanize Canadian talent to discover and motivate collaboration that will benefit patients globally."

— Dr. Rebecca Wong, Princess Margaret Cancer Centre & CNIC Oncologist and Clinical Scientist Network

Increasing alignment between industry and healthcare leaders

The rapid pace of innovation in radiotherapies and diagnostics since the launch of Isotopes for Hope in 2023 has highlighted the need for a coordinated national network that connects Canadian experts to ensure patients can continue to receive a reliable and safe supply of life-saving medical isotopes.

Established in 2025 through the Isotopes for Hope campaign, the **National Oncologist and Clinical Scientist Network** leverages leading Canadian physicians and academics to expand the CNIC's advocacy in alignment with patient and research needs. This new network will provide a critical platform to progress towards our goal of doubling isotope production by 2030, while reducing barriers for patients, supporting innovation in healthcare, and reinforcing Canada's isotope leadership role.

Canadian Economic Impact of Medical Isotopes

In the healthcare sector, Canadian innovators are seizing the growing economic opportunity. Targeted investments from governments and the private sector have already paved the way for major successes in the isotope sector.

$3.1 billion CAD over 11 years invested by the Government of Canada to support CNL's nuclear science research.

$1.4 billion US acquisition of Point Biopharma by Eli Lilly in 2024.

$2.4 billion US acquisition of Fusion Pharmaceuticals, a spin out of McMaster University, by AstraZeneca in 2024.

$525 million US acquisition of Kinectrics by BWXT in 2025.

$175 million CAD in Series C financing secured by Alpha-9 Oncology, a spin out of BC Cancer, to advance their clinical pipeline of radiopharmaceuticals.

$1.6 billion CAD from the Ontario government, followed by a $75 million CAD donation from the Temerty Foundation, to support the construction of two new state-of-the-art research facilities at the Centre for Addiction and Mental Health (CAMH).

$142 million CAD in combined Series A and B financing raised by Abdera Therapeutics, a spinoff of adMare BioInnovations, to advance their antibody engineering platform for radiopharmaceutical design.

$399.8 million CAD over 5 years invested by the Government of Canada to support infrastructure upgrades for TRIUMF's particle accelerator.

Over **$100 million** CAD in Series A financing generated in 2022 to form AtomVie, a spin out of CPDC.

$90 million CAD invested by AtomVie to construct a 64,000 sq ft radiopharmaceutical manufacturing and processing facility. The facility is expected to be fully operational in 2026.

$82.5 million US

acquisition of ARTMS, a spin out of TRIUMF following a $13 million CAD federal government investment, by Telix Pharmaceuticals in 2024. ARTMS previously secured $20 million US in Series A funding from the private sector.

$32 million CAD

in funding from the Government of British Columbia to construct and operate TRIUMF's new Institute for Advanced Medical Isotopes, which will increase BC's isotope production capacity when completed in 2026.

$32 million CAD

invested by the Government of British Columbia in 2024, including $32 million CAD for a new cyclotron and radiopharmacy lab at BC Cancer, and $11 million CAD to TRIUMF to advance research.

$80 million CAD

invested by the Government of Canada through the SIF and the private sector to create the CMIE and advance several major shovel-ready isotope projects.

$57 million CAD

investment to McMaster University from the Canada Foundation for Innovation in 2024 to enable the launch of the Canadian Neutron Beam Laboratory.

$35 million US in

Series D financing raised in 2025 by ABK Biomedical to support clinical operations and commercialization of Eye90 (Y-90) microspheres.

$30 million CAD invested

by Isologic Innovative Radiopharmaceuticals for a new 18MeV cyclotron, 17 hot cells, and an advanced isotope production facility in Québec, to be operational in 2026.

$13 million CAD

from the federal government to install a second Isotope Production System at Bruce Power.

$80 million CAD

invested by BWXT in 2024 to expand its Cambridge, ON manufacturing plant, supporting isotope production infrastructure by contributing components, maintenance, and engineering services.

$22 million CAD invested

by Kinectrics, matched by $1.5 million CAD in funding from the Ontario government to construct a Stable Isotope Production Facility.

$18.5 million CAD

provided by the BC Cancer Foundation in 2024 to support capital investments and funding for critical cancer research.

$18 million CAD in

funding from the Ontario government to match a $6.8 million CAD investment to enable the McMaster Nuclear Reactor to achieve 24/7 operations.

$10 million CAD private investment to establish the Silber Family Theranostics Centre at Princess Margaret Hospital, supported by an additional $500,000 CAD donation from Laurentis Energy Partners.

Nearly $5 million CAD in funding allotted between 2023-2025 by the CMIE through its Development Fund to support promising radiopharmaceutical research and start-up companies.

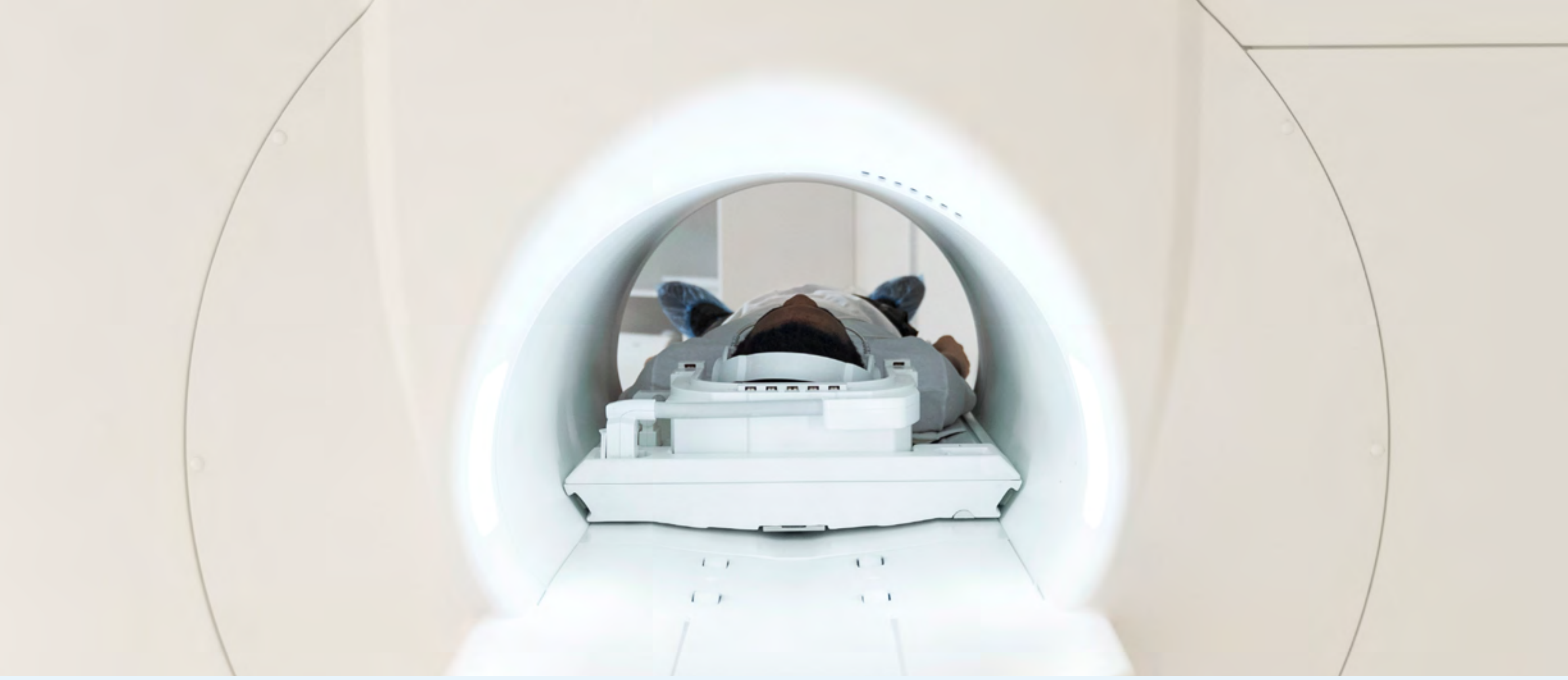
$2 million CAD from the Ontario government and $5.2 million CAD from the private sector to support Alzheimer's research using molecular imaging and theranostics at St. Joseph's Health Care London and Lawson Research Institute.

$3 million CAD in funding from Mitacs granted to CAMH and the University of Toronto to create a radiopharmaceutical commercialization hub and to train the next generation of clinicians and scientists.

Over $410,000 CAD in funding from PrairiesCan in 2023 to support isotope production at the Fedoruk Centre.

$400,000 CAD invested in the Fedoruk Centre by Innovation Saskatchewan to fund eight nuclear science research projects.

$95,000 CAD investment to Sunnybrook Health Sciences from Bruce Power to establish a clinical trial in Co-60 stereotactic radiosurgery.



The Global Isotope Opportunity

GLOBAL GROWTH

The global market for nuclear medicine was valued at $9.3 billion US in 2023 and is expected to reach up to **$42 billion US by 2033**.

PATIENT IMPACT

Nuclear medicine benefits **over 40 million patients annually**, including 1 million Canadian patients.

MARKET LEADER

North America remains the largest market region, making up **46% of the global market**.

CANADIAN EXPANSION

Canada's nuclear medicine market is expected to reach up to **$1.2 billion US by 2030**.

Isotopes as a pillar of oncology: Changing the game in cancer care

DIAGNOSTICS

Medical imaging and diagnostics, including PET and SPECT scans, have historically accounted for the largest portion of the global nuclear medicine market and remain a vital component of global healthcare. Innovative radiotracers allow physicians to identify where the cancer is located and the extent of the disease in an efficient and effective manner that provides highly accurate, real-time results. Imaging also plays a vital role in advancing research by helping researchers and clinicians assess new and emerging discoveries for the future of healthcare.

1 BILLION

Over the past 30 years, over 1 billion patients have been scanned using F-18 globally.

70% FOCUSED ON CANCER CARE

While there are many applications in cardiology and neurology, around 70% of PET scans are used to diagnose cancers and assess oncology treatments.

80,000 SCANS PER YEAR

Canada has approximately 1.5 PET units per 1 million people, with Québec leading the way in the highest volume of scans at nearly 80,000 scans/year.

185,000 SCANS ANNUALLY

In 2022-2023, over 160,000 publicly funded PET scans were delivered in Canada. This demand is projected to increase to over 185,000 scans annually by 2040.

331 SPECT-CT

There are 331 SPECT-CT units across 180 sites in all 10 provinces in Canada.

ADVANCED PET SCANNERS

In 2025, BC Cancer and the University of British Columbia installed one of the most advanced PET scanners in Canada, offering faster scans, higher image quality with the largest field of view, and less radiation exposure.

Nuclear medicine physicians estimate that they can cure more than 60% of cancers if caught in time, and nearly 90% of pediatric cancers.

With greater diagnostic capacity that leverages the power of isotopes, the healthcare system can reduce the need for invasive biopsies and other time-consuming scans that delay a patient beginning treatment. A timely, accurate scan allows for earlier treatment when the disease is less progressed, requiring fewer hospital resources down the line.

Improving access to better imaging, treatments, and isotope innovations could prevent 9.6 million deaths worldwide by 2030 and extend patient lives around the world by more than 232.3 million years total.

Treating cancer that is diagnosed at an early stage can be 2-4x less expensive compared to treating advanced stages of cancer.

Scaling up imaging and treatment could also provide a return on investment of $179.19 US per $1 invested, according to the Lancet Oncology Commission.

RADIOTHERAPEUTICS

Over the past decade, medical isotopes have become a critical component of cancer therapy. Specialized radioligand therapies and radiotheranostics now offer physicians the possibility of selectively targeting abnormal cells non-invasively, minimizing the impact of side effects and risk of long-term complications. Through these advancements, we are revolutionizing how we approach cancer care.

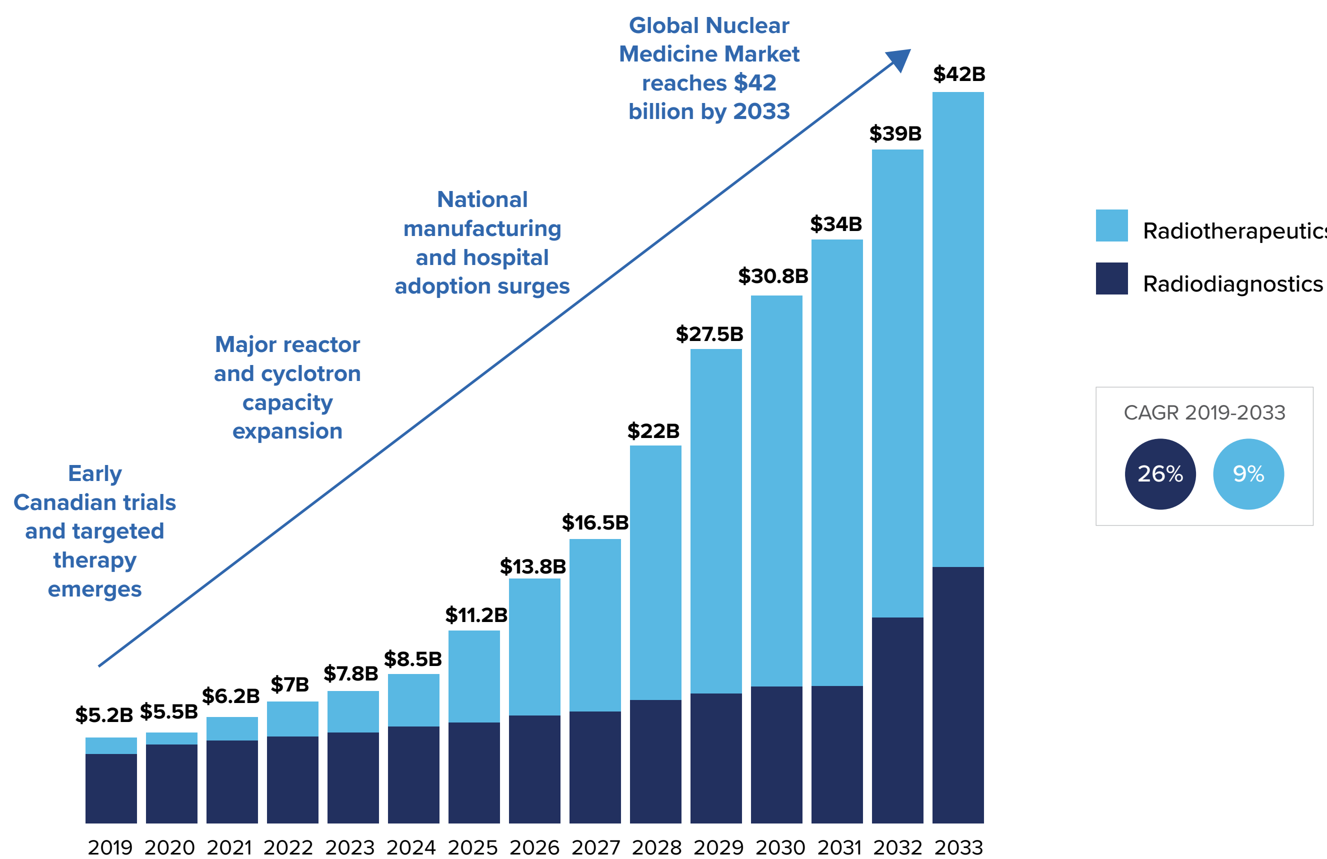
In recent years, the radiotherapeutic market has continued to grow steadily, alongside increasing recognition of the significant benefits offered to patients. While the global nuclear medicine market has historically been dominated by highly-effective diagnostic agents, this market is beginning to shift as more therapeutic applications emerge globally, and new scientific and clinical research advances.

Radiotherapeutics emerged on the global nuclear medicine market in the early 2010s and have become a key tool in oncology.

Today, 50–70% of cancer patients will require radiotherapy during their treatment journey.

In 2019, radiotherapeutics accounted for 20% of the total nuclear medicine market. By 2033, therapeutics will grow to represent up to 75% of the $42 billion US market.

Global Radiopharmaceutical Market Size (in US$ Billions)

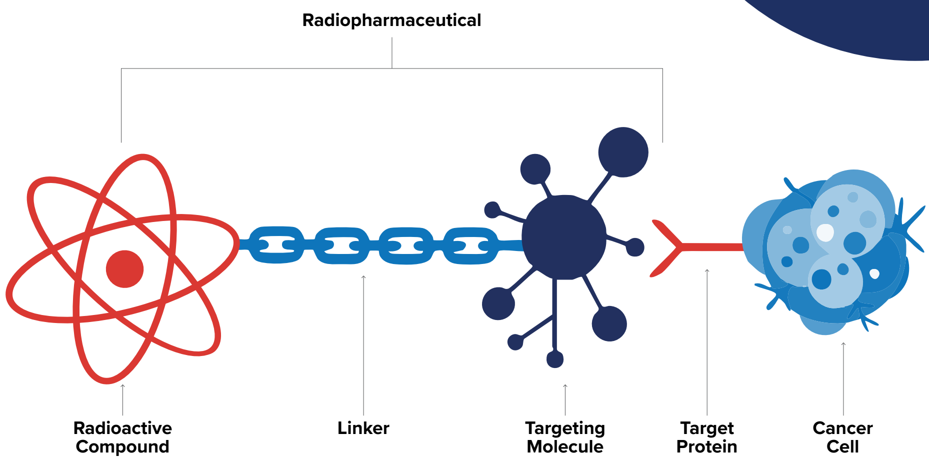


Source: MEDraysintell. Nuclear Medicine Report & Directory. Edition 2021.

Radiotheranostics

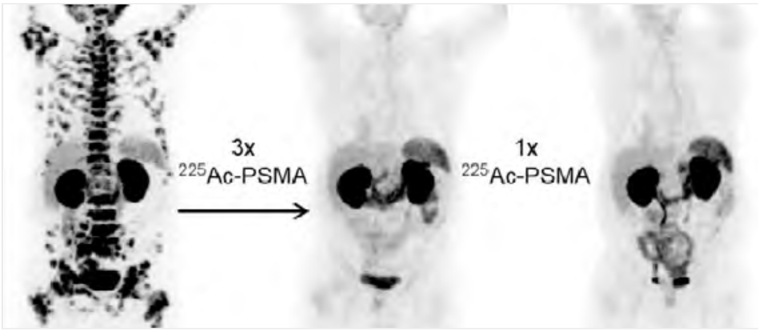
Emerging medical isotopes are increasingly being used to create "theranostics" (THERA-peutics + diag-NOSTICS), drugs that combine the power of radiation with a specialized protein or peptide to deliver the maximum damage to diseased cells. Theranostics allow for targeted, localized treatment of a disease within the body with minimal damage to healthy surrounding tissues or post-treatment side effects.

The radiotheranostics market was valued at $2.2 billion US in 2023 and is expected to reach $6.7 billion US by 2032.



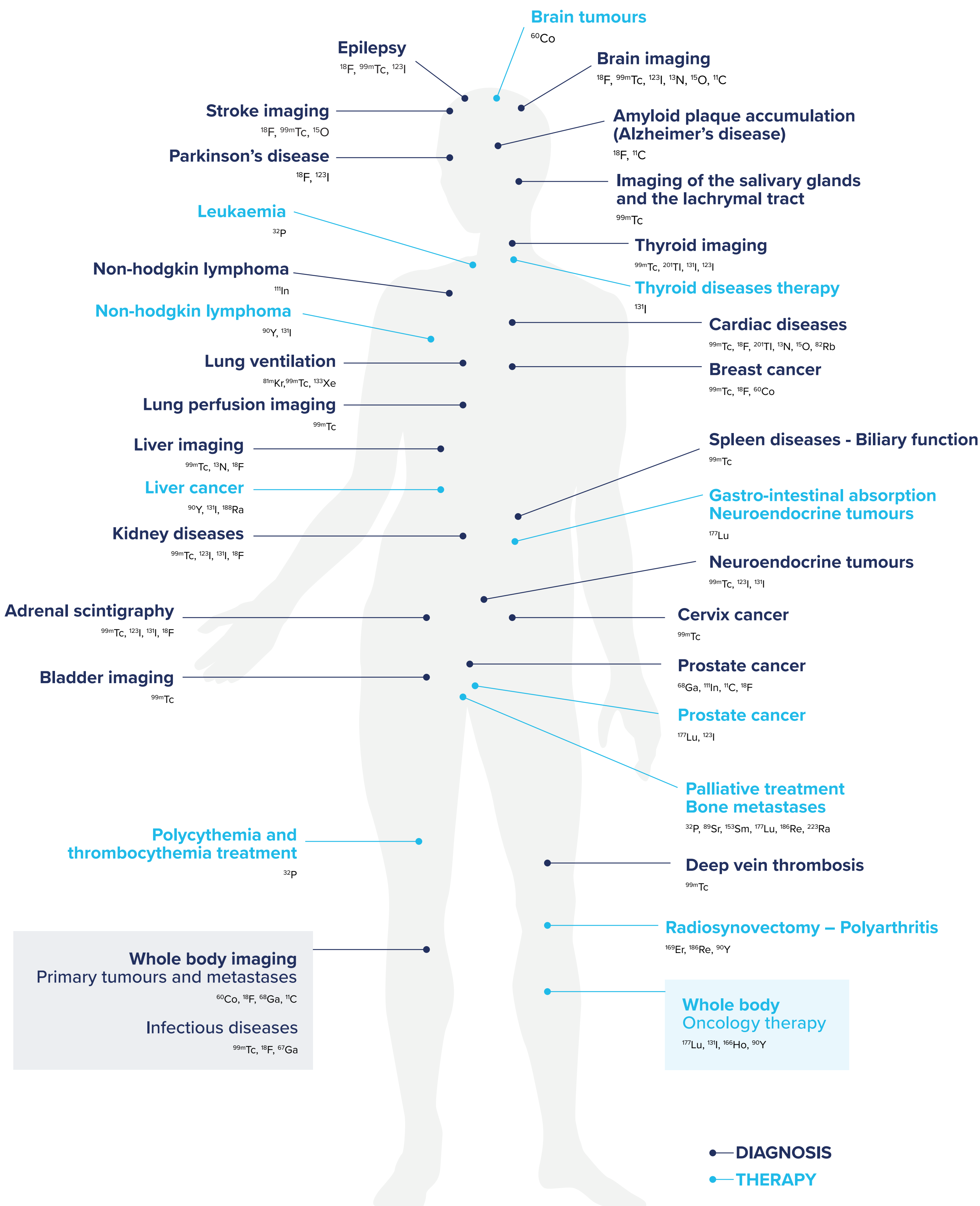
Each radiotheranostic drug has its own individual diagnostic pair - a selected radiotracer that is used to image the disease state and the theranostic uptake. This allows physicians to monitor how the cancer responds to the treatment in real time and tailoring treatment plans, maximizing the benefits to patients. When treating cancer, time is of the essence. Compared to conventional treatments that require multiple scans and tests to verify progress over time, radiotheranostics allow treatments to have high impact results in a short period of time.

Pictured: A patient scan after an Ac-225 theranostic treatment for prostate cancer.



Source: C Kratochwil et al, J Nuc Med (2016) doi:10.2967/jnumed.116.178673

Current global applications for medical isotopes

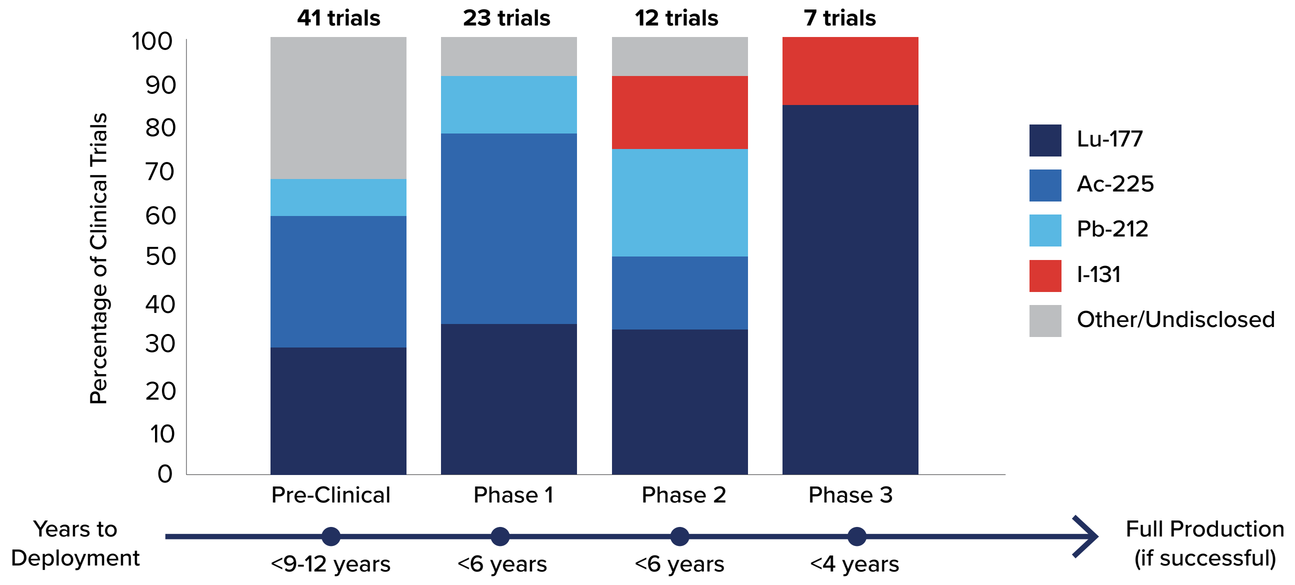


Recognizing the potential of medical isotopes, there are now hundreds of clinical trials happening around the world, including many here in Canada, that are exploring advanced, innovative ways to leverage radioligand therapy and theranostics in oncology, neurology, cardiology, and other health applications. With a rising number of treatment trials, driven by the emergence of new target therapeutic applications, the opportunity for Canada continues to grow.

"Over the last few years, theranostics and radioligand therapy have emerged as new, powerful tools in our fight against cancer, with the potential to fulfill many unmet needs. Thanks to Canada's leadership in radioligands production, we have had the privilege to be able to make Canadian patients be amongst the first to benefit from some of these advances."

— Dr. Daniel Juneau, Centre Hospitalier de l'Université de Montréal (CHUM) & CNIC Oncologist and Clinical Scientist Network

Canadian Clinical Trials by Isotope and Phase



Source: CANDU Energy, an AtkinsRéalis Company

The Cost of Cancer in Canada

In Canada, cancer continues to be a major cost-driver for our publicly funded healthcare system, costing nearly $40 billion CAD in 2024. However, the economic burden of cancer expands beyond system spending, placing 20% of this cost burden directly on patients and their families.

In fact, 1 in 3 Canadian cancer patients experience financial strain from out-of-pocket expenses, sometimes totaling over $2,000 in expenses per month, to cover travel and accommodations for treatment visits, uncovered medication, home care, and more. Additionally, cancer often requires patients and caregivers to take unpaid time off from work, reducing their earnings to cover out-of-pocket expenses as well as their ability to contribute to the economy. Newly diagnosed patients in Canada lose about 36% of working hours, and caregivers about 23%, during initial treatment.

Global cancer rates are rising. The World Health Organization projects over 35 million new cancer cases by 2050, up 77% from 2022.

2 in 5 Canadians will be diagnosed with cancer in their lifetime. In 2024 alone, almost 250,000 Canadians were diagnosed with cancer.

In 2010, the total annual economic cost of cancer through global healthcare expenditures and loss of productivity was $1.16 trillion US. Between 2020-2050, **cancer will cost global health systems over $25.2 trillion US.**

In 2024, the total **economic impact of cancer in Canada was over $37.7 billion CAD.**

In 2024, cancer cost Canadians:

$30.2 BILLION CAD

in direct healthcare system costs

$3.7 BILLION CAD

in out-of-pocket patient expenses

$2.5 BILLION CAD

in patient time costs, including travel to/from appointments, waiting for and receiving treatment

$1.4 BILLION CAD

in direct patient costs and lost earnings

Source: Canadian Cancer Society 2024 Special Report.

Reducing Costs, Saving Lives: The Health Economic Impact of Medical Isotopes

By investing in diagnostic technologies and treatment pathways that get patients back to their lives, their jobs, and their families sooner, Canada can offset the downstream financial impacts of cancer. **Medical isotopes have the potential to:**

- **Catch diseases earlier**, allowing for earlier treatment that can be measured in real time
- **Decrease or avoid hospital stays** and emergency room visits
- **Decrease the need** for long-term nursing care
- **Lessen the risk of complications** from more complex surgeries, while also reducing the need for operating rooms
- **Reduce side effects and toxicity** associated with conventional treatments, which avoids the need for secondary medications to manage side effects, complications, and pain

These factors translate into measurable, GDP-linked value and long-term health-system efficiencies.

CANADIAN-MADE COBALT-60 IMPROVING BREAST CANCER OUTCOMES

Canada has been a leader in the production and use of high-specific-activity Co-60 for cancer treatment for decades, delivering the world's first Co-60 treatment at Victoria Hospital in London, Ontario in 1951, using Co-60 produced at Chalk River's National Research Experimental (NRX) Reactor. Canada has since maintained this leadership by producing over 50% of the global supply of Co-60 in the OPG and Bruce Power CANDU reactors, and is also responsible for processing the majority of the global Co-60 supply. In 2019, Bruce Power, Nordion, and Xcision entered into a collaborative framework agreement to support the use of Co-60 for the GammaPod, a stereotactic radiotherapy system designed to treat breast cancer non-invasively.

Treating one breast cancer patient conventionally costs the healthcare system over five times more than a healthy woman of a similar demographic, resulting in an average of $30,000 CAD in additional costs to the healthcare system per patient, per year. For later stage patients, this cost increases to over $130,000 CAD per patient, per year, driven by additional need for inpatient hospitalizations, home care, more frequent visits to hospitals, clinics and emergency rooms, and more costly medication like complex chemotherapy drugs.

Medical isotope radiosurgery offers a revolutionary alternative to reduce the impacts on the healthcare system. With the GammaPod, radiation oncologists can significantly shorten a patient's overall treatment timeline for early-stage breast cancer, reducing treatment from 6-8 weeks to a matter of days.

Delivered on an outpatient basis with less treatment visits and follow-up appointments required, the Co-60 GammaPod has significant benefits for both patients and the healthcare economy alike. With fewer, shorter treatments, patients and caregivers spend less time away from work and daily routines. Patients can also reduce their travel and accommodation costs, while reducing the need for extended caregiving. This shorter, focused treatment also frees clinic time and staff capacity, allowing hospitals to serve more patients and reduce waiting lists.

In all, this technology can reduce the economic impact of breast cancer on the healthcare system by up to 40% for some patients. In Canada, breast cancer remains the second most common cancer, impacting 1 in 8 women in their lifetime. Leveraging this technology can revolutionize the treatment experience for hundreds of patients, while reducing the economic impact of breast cancer treatment, all while using made-in-Canada Co-60.

REVOLUTIONIZING THE TREATMENT OF HARD-TO-TREAT CANCERS THROUGH RADIOLIGAND THERAPY

Canada is emerging as a world leader in the production, research, and use of isotopes that show significant promise in treating hard-to-treat cancers and diseases. From recent initiatives that work to address supply shortcomings for Ac-225, to efforts to provide Canadian sources of isotopes like Cu-67 and Y-90, and to leadership in global Lu-177 production, Canada is working to make a difference in global cancer care.

Importantly, Canada is among the largest global producers of Lu-177 for cancer therapy. Through a historic partnership between Bruce Power, Isogen, ITM, and the Saugeen Ojibway Nation, Bruce Power has been producing significant quantities of Lu-177 since 2022, doubling production at an additional Unit in 2024. More recently, OPG's Darlington reactor has also announced a new CNSC licence amendment to explore production of Lu-177, adding to Canada's redundancy of supply for this essential cancer-fighting isotope.

There are presently two radioligand therapy drugs available in Canada: Pluvicto, used to treat metastatic prostate cancer, and Lutathera, used to treat neuroendocrine tumors (NETs), which both leverage Lu-177 for targeted cancer care. Health Canada has also approved Illuccix, which is a diagnostic agent that leverages Ga-68 needed to identify which patients are eligible for Lu-177 prostate cancer therapy.

Prostate cancer is the most diagnosed cancer among Canadian men. Compared to other treatments, patients who are treated for prostate cancer using radioligand therapy often demonstrate significantly improved quality of life, and reduced symptoms and pain. For some of these patients, the treatment completely cleared the spread of cancer in just six months.

Compared to other treatment options, radioligand therapy has the potential to:

1. Reduce overnight hospitalizations caused by toxicity and complications by approximately 50-60%.
2. Enable fewer outpatient treatments and infusion visits.
3. Extend progression-free survival, translating to lower long-term costs on public resources. For example, radioligand therapy can allow for reduced risk of disease progression by 72% for some patients when used as a first-line treatment for NETs.
4. Generate social and economic benefits, as healthier patients can keep working, care for their families, and contribute to their community. It is estimated that expanded patient access for these therapies could contribute up to $4-6 million CAD in national economic value by 2030 by reducing indirect patient costs and lost earnings.

Radioligand therapy represents a targeted, effective option in a physician's toolkit that can extend and improve quality of life for patients. The precision and efficacy of radioligand therapy reduces the need for prolonged or repeated interventions, ultimately delivering better outcomes for both patients and health systems.

Emerging research has demonstrated that combining radioligand therapy with other innovative treatments can further enhance patient outcomes and have greater positive impacts on the healthcare system. For instance, recent studies have shown that Lu-177 therapy, such as Pluvicto, can reduce cancer progression by nearly 30% in men with hormone-sensitive cancer when combined with standard hormonal therapy. By integrating radioligand therapy earlier in the cancer care continuum, we can harness its unique ability to complement surgery, chemotherapy, and immunotherapy, offering patients a more personalized path forward.

Reaching Canada's 2030 Promise

In order to reach our goal of doubling Canada's production of isotopes by 2030, while supporting additional capabilities across the supply chain and increased patient delivery, Canada will need to prepare for the sustainable expansion of the sector, across:

1. Intergovernmental, cross-sectoral action and involvement
2. Certainty around reimbursement pathways for life-saving isotopes
3. A secure isotope workforce for 2030 and beyond
4. Clear waste management strategies
5. International Canadian leadership in global access to cancer care

These recommendations, if implemented, provide the isotope sector with the strategic direction, talent, and certainty needed to take Canada's leadership to the next level.

RECOMMENDATION 1

Intergovernmental, cross-sectoral action and involvement

Canada's isotope leadership today stems back to government-driven decisions made during the formative years of the global nuclear medicine industry. These decisions, including the formation of AECL, the construction of the NRU and NRX Chalk River reactors, and the development and investment into infrastructure like our CANDU technology, the McMaster Nuclear Reactor, and TRIUMF. Since the inception of the Canadian isotope sector, support, involvement, and direction from government has been a key reliable driver of success.

Continued government coordination and support is essential for future growth. The creation of a coordinated, cross-functionally aligned **National Isotope Strategy** would enable support for all isotope-related activities, encouraging growth within every aspect of the supply chain from source materials, research, production including domestically-sourced technologies, healthcare delivery, distribution and logistics, export, and the development of medical and industrial applications.

The development of a National Isotope Strategy could be supported by experts across the entire isotope and nuclear medicine sector, through the establishment of a **National Isotope Advisory Council**. This Advisory Council should include representatives from both the public and private sectors, healthcare, the nuclear sector, science, and academia, enshrining collaboration across the sector in support of government priorities. This council can leverage the existing expertise within the CNIC's membership as well as the CNIC's newly announced National Oncologist and Clinical Scientist Network.

The council could mirror the recently announced Nuclear Isotope Innovation Council of Ontario (NIICO), which was established by the Government of Ontario in July 2025. A federal council could leverage the NIICO's work to inform policy within the federal government's jurisdiction, beginning with the creation of a National Isotope Strategy.

Through this approach, the industry will be able to count on certain, stable government support, maintaining our current healthcare and infrastructure advantages for the long-term, while ensuring strategic government involvement in the future of the sector.

RECOMMENDATION 2

Certainty around reimbursement pathways for life-saving isotopes

Canadian-made drugs and devices can face challenges in the reimbursement process, which may cause delays to widespread adoption and access compared to other jurisdictions.

Long delays for reimbursement and adoption means that drug manufacturers face extended timelines for return on investment to recoup drug development costs, which creates risk and uncertainty. Greater certainty on reimbursement processes and streamlined procedures will help bring drugs to market faster, while de-risking the manufacturing investment process for companies in Canada.

The first step towards streamlining the reimbursement process across Canadian provinces will be a **comprehensive review of previous recent reimbursement decisions** to identify opportunities for improvement. This review should take into consideration the complex pipeline involved in the production of a radiopharmaceutical drug, including access to nuclear production infrastructure, high upfront capital investment, and specialized manufacturing & supply chain that allows for just-in-time transportation, as well as the significant benefits of radiopharmaceuticals to patients and savings to the broader healthcare economy.

A second step will include examining opportunities to leverage new and existing mechanisms to expedite drug approvals and reimbursements. A key example could include Ontario's Funding Accelerated for Specific Treatments (FAST) program, which allows the province to provide faster access to high-priority cancer drugs, reducing the wait time for eligible patients by up to nine months by beginning the funding process while national pricing negotiations are still ongoing. Including breakthrough radiopharmaceutical drugs and devices within the FAST and similar programs will help improve access for Canadians.

"In my 35 years' practice as a Nuclear Medicine Physician in Canada, I have witnessed the incredible evolution of medical isotopes into an ever-increasing role as a critical component of care in patients dealing with serious and life-threatening illnesses. Today, the diagnostic and therapeutic impact of these special atoms is so vital that any disruption of supply puts patients at risk with delayed and less optimal care."

— Dr. Andrew Ross, QEII Health Sciences Centre & CNIC Oncologist and Clinical Scientist Network

RECOMMENDATION 3

A secure isotope workforce for 2030 and beyond

Canada's isotope sector supports close to 9,000 jobs across the supply chain, but as the industry grows to meet our goal of doubling production capacity by 2030, more highly skilled talent will be essential to long-term sustainability. To support increased production and processing alone, **the workforce will need to increase by 33% by 2030**.

To address the rising need for talent, Canadian and provincial governments could:

1. Integrate teaching about nuclear energy and isotopes into school science curricula, across both elementary and high school, to increase awareness of the sector early.
2. Invest in broader post-secondary programs across health, engineering, chemistry, sciences, and more to include isotope education, pulling students from all faculties. This could also involve increasing the number of STEM-dedicated seats and dedicated a specific portion to programming related to isotope education.
3. Explore opportunities to fund innovative industry-academic partnerships aimed at providing hands-on, experiential learning for students in isotope-related courses, jobs, and co-op placements.
4. Build Canada's roster of highly trained individuals in careers like radiochemistry, radiopharmacy, and engineering with a key understanding of isotope technologies, and more, by considering opportunities to create specialized accreditation programs, micro credentials, and multi-disciplinary learning and training programs leveraging Canada's universities, institutes, and national laboratories.
5. Expand Canada's talent for radiopharmaceutical delivery, including professionals like radiation oncologists, medical radiation technologists, nuclear medicine technologists, and nuclear medicine specialists.

RECOMMENDATION 4

Clear waste management strategies

Canada has established waste classification systems and disposal pathways through the Integrated Strategy for Radioactive Waste (ISRW), developed by the Nuclear Waste Management Organization (NWMO) with input from a broad range of stakeholders and rights holders. However, small-scale isotope producers, particularly in the medical and research sectors, continue to face barriers in accessing long-term disposal solutions. Unlike reactor fuel-based waste owners, who are typically NWMO members or have the capacity to negotiate commercial agreements, smaller producers often lack the scale, resources, or infrastructure to do so independently.

To ensure fairness and inclusivity across the sector, the Government of Canada could work with the Canadian Nuclear Safety Commission (CNSC) and NWMO to **enable practical, scalable mechanisms** for these producers. One approach could be to facilitate partnerships between small producers and larger waste owners, allowing for consolidated access to disposal pathways through NWMO. This would help ensure that all radioactive waste, regardless of origin, volume, or producer size, is **managed within a unified, lifecycle-based framework**.

RECOMMENDATION 5

International Canadian leadership in global access to cancer care

Recognizing Canada's current leadership position, we face a major opportunity, and a responsibility, to support increased global access to life-saving isotopes around the world.

Launched in 2022, Rays of Hope is a global cancer initiative led by the International Atomic Energy Agency (IAEA) to improve access to cancer care, diagnostic imaging, and radiotherapy infrastructure in low- and middle-income countries (LMICs), where millions of patients still do not have access to this critical care. Rays of Hope has already provided support to 40+ countries, with another 50+ formally requesting support. In March 2025, the CNIC and the IAEA signed Practical Arrangements to advance Canadian support for the initiative.

The Government of Canada can formally **join and contribute to the Rays of Hope initiative** as a national partner to help close the gap in access to cancer care. Canada can have a long-lasting global impact in the international healthcare community to widen access to cancer care.

Conclusion

As this report shows, Canada has been at the forefront of medical isotope production, research, and use for nearly 80 years, driven by innovation across the supply chain, key infrastructure investments, and breakthroughs in health research.

Today, we know that medical isotopes hold the potential to drastically change the way we diagnose and treat cancer, providing a new sense of hope to patients while reducing strain on the healthcare system. In the coming years, there will be several opportunities for Canada to expand its existing leadership position within the international isotope market, rising to the challenge to become the leader in the global fight against cancer.

The CNIC's Isotopes for Hope campaign continues to drive expansion, investment, and support for this important Canadian sector. We have already seen great progress on our ambitious goal of doubling Canada's production of isotopes by 2030, now with provincial government leadership in Ontario in support of this goal, but there is still more work to be done.

This is our 2030 promise to Canadians: We will continue to collaborate with our healthcare partners and governments at all levels, we will work with sector leaders to overcome challenges in our supply chain, and we will partner with academic institutions to shore up our workforce and prepare for rising demand.

Most importantly, we will work to ensure that patients in Canada and around the world have access to the best standard of care, all while equipping our healthcare system with the right screening and treatment tools to reduce the global economic impact of cancer.

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