

# Provincial Isotope Sector Briefing Ontario



Image from Novartis Pharmaceuticals Canada Inc.

## Executive Summary

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**Global isotope leader**  
For nearly 8 decades, Ontario has been a global leader in the research, development, use, and production of medical isotopes.
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**World-class isotope infrastructure**  
Ontario's world-class infrastructure and strength in both reactor- and accelerator-based technologies have shaped its diverse medical isotope production landscape.
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**Cutting-edge cancer care and research**  
Ontario is home to leading theranostics and research centres which are leading the future of cancer care throughout the world.


## Isotope Infrastructure


A snapshot image of the world-class leading production facilities and infrastructure in Ontario



These production facilities are supported by a network of supply chain companies.

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**Power Reactors**  
3 Nuclear Power Generating Stations
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**Research Reactor**  
Canada's most powerful research reactor
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**Cyclotron Facilities**  
8 Cyclotrons

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## Isotope Impact

Ontario has been a historic leader in the development and production of several critical isotopes:



**35 Million+** patients worldwide have benefited from Co-60 technology that was first pioneered in Ontario

**50 percent** of Co-60 is produced, and nearly 80% of the world's Co-60 is processed in Ontario

**30 percent** of the world's single-use medical equipment is sterilized with Low-Specific-Activity Co-60



**60 percent** of I-125 global demand is produced at McMaster Nuclear Reactor (MNR)

**24/7 operations** will be reached by the MNR to support the increased production of isotopes

**80 thousand** cancer patients will be treated annually with I-125 isotopes produced in the MNR



**70 percent** of the supply of Lu-177 for Pluvicto is estimated to come from Bruce Power

**1000+ patients** have already been treated with Lu-177 based therapies across Canada since December 2024

**3 million** doses of Lu-177 are anticipated to be supplied at OPG's Darlington once the system is online

Ontario is also developing production pathways for other critical isotopes including:



OPG's Darlington will become a key commercial power reactor source of Y-90



Darlington has become the first commercial nuclear station in the world licensed to produce Mo-99, which will meet nearly the entire North American demand

 **DID YOU KNOW?**



Canada's early isotope innovation was driven by Ontario's NRU and NRX reactors. These Chalk River reactors produced over 70 different isotopes during their lifespans, supporting over one billion medical procedures globally.

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## Isotope Infrastructure

Ontario is home to leading facilities that support isotope processing and manufacturing, such as:



**BWXT Medical**  
BWXT Medical is a leader in manufacturing, supplying, and processing medical isotopes; and, is home to a 17,000 sq ft facility in Ottawa.



**Nordion**  
Nordion is the leading global supplier of Co-60, with operations anchored at its licensed nuclear substance processing facility in Kanata.



**Kinectrics**  
Kinectrics operates radiochemistry laboratories, hot cells, a stable isotope production facility, and enrichment systems tailored for isotope handling and irradiation.



**AtomVie Global Radiopharma**  
AtomVie is scaling up with the construction of a new state-of-the-art facility in Hamilton through a \$160 million CAD investment to expand its current clinical manufacturing capacity.

## Ontario's Diagnostic Infrastructure



## Workforce Development and Education



Algonquin college offers a two-year Applied Nuclear Science and Radiation Safety Ontario College Diploma program, which is the only program of its kind in Canada. Algonquin also provides a Medical Radiation Technologist program.



The Centre for Addiction and Mental Health (CAMH) Brain Health Imaging Centre is Canada's largest mental health teaching hospital and a leader in brain imaging and molecular radiochemistry research.



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## Workforce Development and Education



Western University is a leading Canadian research institution advancing innovation in medical imaging, radiopharmaceutical development, and isotope science, offering training and educational opportunities such as:

- A Medical Imaging Technologist (MIT) program in collaboration with its hospital partners.
- One of the largest academic Molecular Imaging and Theranostics divisions and training program for residents in Nuclear Medicine in Canada.
- Specialized training programs in Medical Biophysics, Biomedical Engineering, Chemistry, and Medical Sciences, Western is vital to isotope workforce development.

Western University works closely with the following facilities to advance isotope research and produce short-lived PET isotopes:



London Health Sciences Centre



Lawson Health Research Institute



London Health Sciences Centre Research Institute



St. Joseph's Health Care London



Cyclotron & PET Radiochemistry Facility



Robarts Research Institute



Biomedical Imaging Research Centre



Laboratory for Stable Isotope Science, and Interface Science

London has significant research and isotope excellence given its cyclotron facility, PET radiochemistry, clinical nuclear medicine, and translational research capacity across LHSC, SJHC, and their affiliated institutes.



Ontario Tech University offers the only Nuclear Engineering undergraduate program in all of Canada. Ontario Tech partners with leading industry players to offer a unique and transformative upskilling program, such as the Nuclear Career Accelerator Program, to address critical talent shortages in the nuclear sector.



Georgian College of Applied Arts and Technology offers programs such as:

- The Project Controls & Cost Engineering micro-certificate.
- A revised power engineering technology curriculum that includes nuclear-focused courses critical for the deployment, harvesting, and processing of radioisotope targets in commercial reactors.
- Interdisciplinary oncology and nursing programs.



Mohawk College offers a Nuclear Medicine and Molecular Imaging Advanced Diploma program. Through the program, students develop the knowledge, practical skills, and clinical judgment necessary to deliver patient-centred care while performing nuclear medicine and molecular imaging procedures.



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## Workforce Development and Education



McMaster University's suite of world-class nuclear facilities, including the MNR and Cyclotron Facility, supports the education of hundreds of undergraduate and graduate students in nuclear science and engineering, including a CAMPEP-accredited graduate program in medical physics. From interdisciplinary education streams, to first-of-a-kind camps for Indigenous youth, to hands-on training for international graduate students and career professionals, McMaster is supporting the development of the national and international nuclear workforce.



60+ Undergraduate and Graduate Courses



Minor in Nuclear Studies and Society



Immersive experiential training opportunities for 100+ learners annually



1300+ Alumni in nuclear fields



UNIVERSITY OF  
**TORONTO**

The University of Toronto offers several world renowned programs and training opportunities for students interested in a career in nuclear medicine.

### Department of Radiation Oncology

The academic home of the BSc in Radiation Medicine Sciences, which together with Michener Institute of education at UHN, offer a joint BSc degree and advanced diploma in Medical Radiation sciences. This is the first professional undergraduate program of its kind in Medical Radiation Sciences.

### STARS21 Training Program

The Strategic Training in Transdisciplinary Radiation Science for the 21st Century (STARS21) provides clinicians, graduate students and post-doctoral fellows with the skills essential to conducting research in radiation medicine. The program is run out of Princess Margaret Cancer Centre and offers a residency in nuclear medicine, post grad and fellowship training.

### (Radiotheranostics) Fellowship Program

The Molecular imaging and Therapeutics (Radiotheranostics) Fellowship Program offers Nuclear Medicine and Radiation Oncology Trained physicians the opportunity to gain hands on experience in molecular guided imaging and therapeutics in oncology.

### Faculty of Pharmacy

MsC and PhD students at the Leslie Dan Faculty of Pharmacy have the opportunity to further their research in pharmaceutical sciences and radiopharmaceuticals. The UofT Pharmacy Department is home to its own GCP facilities to train students and produce radiopharmaceutical for clinical trials.



The Michener Institute of Education at UHN is Canada's only post-secondary institution devoted exclusively to health sciences education, offering several programs and continuing educational courses:

- Nuclear Medicine & Molecular Imaging Technology Program (a joint educational program offered through the University of Toronto and Michener).
- Michener also supports upskilling and professional development through continuing education courses such as Nuclear Theranostics.

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## Patient Access to Life-Saving Radiopharmaceuticals



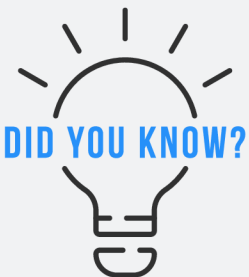
Ontario was the first province in Canada to publicly-fund **Pluvicto** for prostate cancer treatment. The first patient in Canada was treated at the London Health Sciences Centre in December 2024.



Ontario also offers reimbursement for **Lutathera** treatment for patients with somatostatin receptor positive midgut neuroendocrine tumours.



Ontario hospitals such as the London Health Sciences Centre provide patients with treatment using Boston Scientific's **TheraSphere™ Y-90 Glass Microspheres** for liver cancer.



In October 2025, researchers at London Health Sciences Centre Research Institute launched a Phase II clinical trial to treat kidney cancer by inserting TheraSphere™ Glass Microspheres produced by Boston Scientific into blood vessels surrounding cancerous tumours.



Ontario also has world-renowned theranostic centres, delivering cutting-edge cancer treatment:



### London Health Sciences Molecular Imaging and Theranostics

One of Ontario's largest nuclear medicine programs designated as a Comprehensive Radiopharmaceutical Therapy Center of Excellence.



### UHN Theranostics Program

Canada's largest research hospital. UHN's Theranostics Program is a prime example of the journey from research-driven ideation to implementation. UHN has also been designated as a Radiopharmaceutical Therapy Center of Excellence.

### DID YOU KNOW?

In October 2024, a team at London Health Sciences Centre Research Institute was the first in Canada to treat a neuroendocrine tumor patient with Actinium-225 DOTATATE.



### Silber Family Theranostics Centre

The Silber Family Theranostics Centre at UHN is expected to open in 2028. The centre will administer more than 3,500 injections each year, benefiting more than 870 patients.

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## Clinical Trials

Ontario is home to Canada's leading clinical trials sector with world-class scientists, a diverse population, a competitive environment for business, and the country's largest concentration of health sciences companies, hospitals, research institutes, and trial sites. According to Clinical Trials Ontario, the province is home to:

**\$440M**  
in industry investment in Ontario clinical trials

**\$1.73B**  
invested in health research at Ontario hospitals

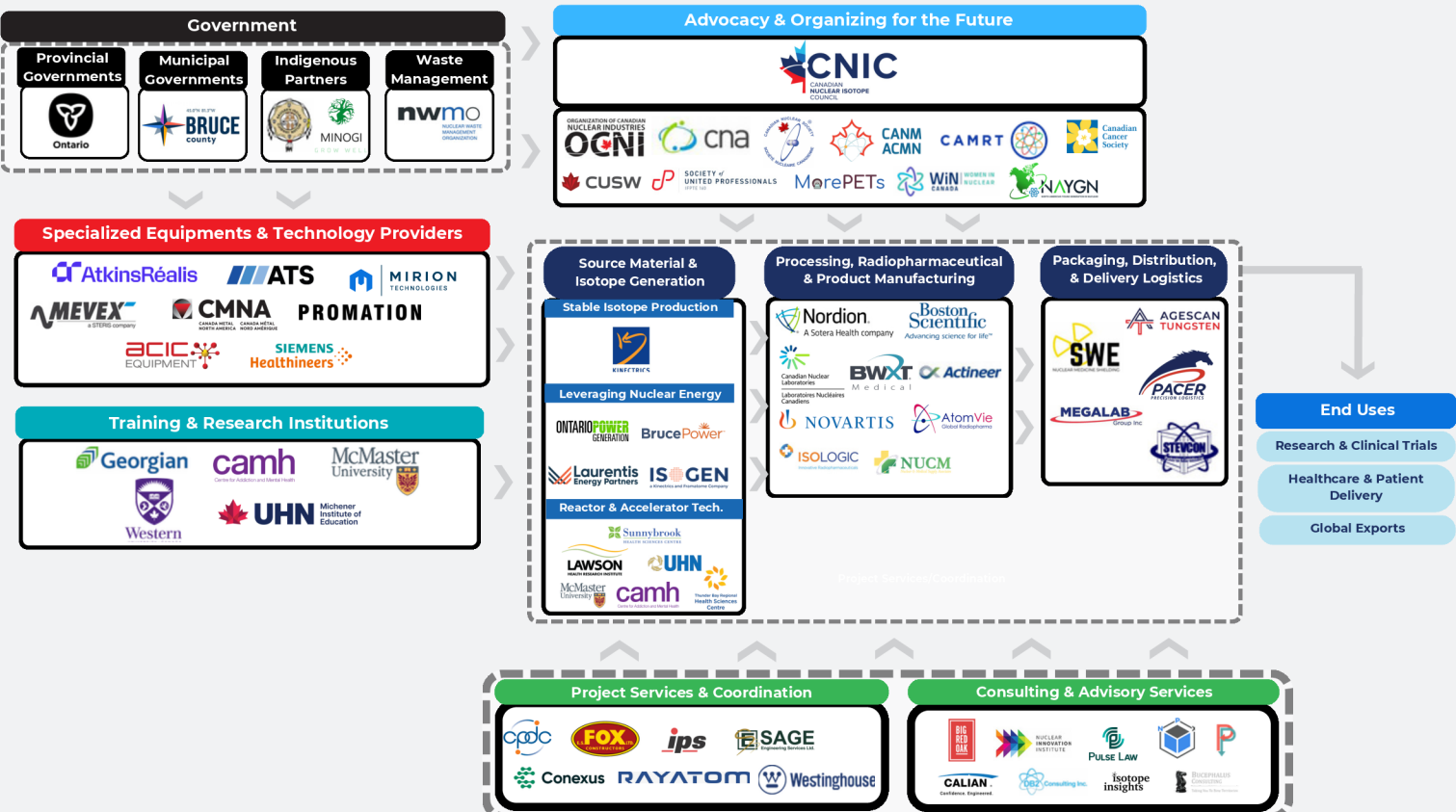
**140**  
hospitals with over 200 unique trial sites

**19**  
of Canada's top 40 research hospitals

Ontario's world-renowned research facilities and clinical expertise are driving the future of isotope innovation through groundbreaking clinical trials for cutting edge radiopharmaceuticals and theranostics.

## Leading CNIC Member Companies and Organizations

Ontario is one of the few jurisdictions in the world that has nearly the complete supply chain for various isotopes. Below is a snapshot of some of the CNIC members that are playing a critical role in driving Ontario's isotope success and leadership:



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