

ISOTOPE



60

Co

Cobalt

⋮

Cobalt-60

Canada's Isotope Success Story



Feature of the Month

Cobalt-60

From discovery to delivery, Canada has led the way in Cobalt-60 (Co-60) innovation and production.



High-Specific-Activity (HSA)
Co-60 is used in therapeutic applications such as Gamma Knife treatments for brain and breast cancers.



Half-life of 5.27 years



Low-Specific-Activity (LSA)
Co-60 is used to sterilize about **30% of the world's single-use medical devices**

How is it produced?



High-purity
Cobalt-59
sintered into
nickel-plated
slugs



Zircaloy
targets
containing
slugs
assembled
into bundles
and then
adjuster



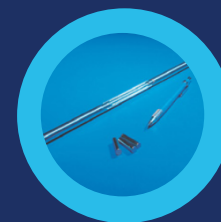
Adjusters are
inserted into
the reactor
for 18-60
months for
conversion to
Co-60



Irradiated
adjusters
removed from
reactors during
outage,
disassembled
and shipped for
processing



Bundles
measured,
disassembled
and placed in
a hot cell to
recover slugs



Slugs mixed to
produce
finished
sealed source
to customer
specifications



Finished
product
shipped in
specialized
container
fleet

Cobalt-60

How is it used?



Sterilization



Cancer radiotherapy



Food irradiation



Industrial applications



Pest control

Where is it produced?

In Canada, LSA Co-60 for sterilization and gamma processing is produced by Canada's commercial nuclear power facilities, leveraging our fleet of CANada Deuterium Uranium (CANDU) reactors. CANDU reactors use adjuster rods containing bundles of Cobalt-59 slugs, which are then irradiated into Co-60 while the reactor is operational, without interrupting power generation.

DID YOU KNOW?

Approximately 50% of the global supply of Co-60 is produced in CANDU reactors in Canada.



The first treatment using Co-60 radiation took place on October 27, 1951, at the Victoria Hospital in London, Ontario.



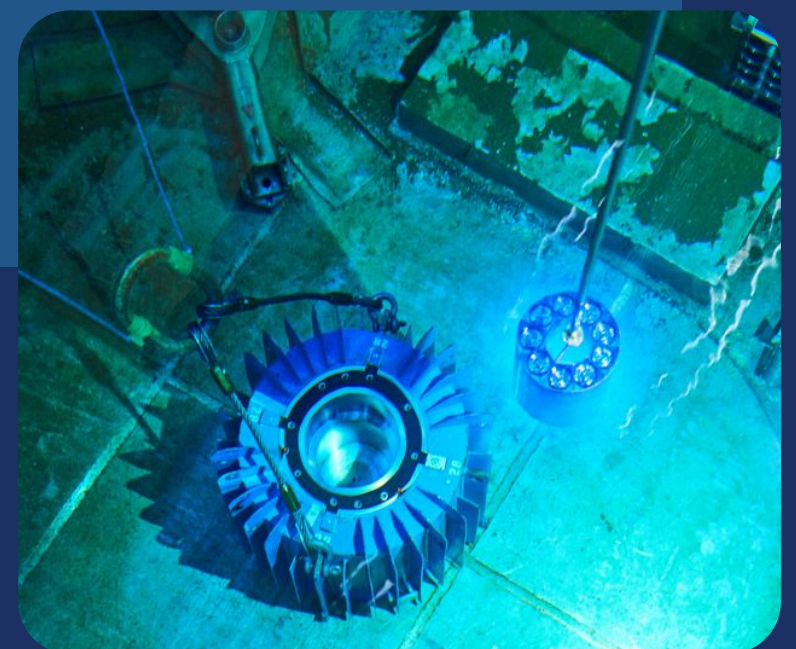
A 1988 Canadian postage stamp commemorating the development of Co-60 radiosurgery.

Case Study on Canada's Leadership

Worldwide, only five countries currently produce Co-60, with Canada in a leadership position. Canada's emergence in Co-60 production began at Atomic Energy of Canada's (AECL's) National Research Experimental Reactor (NRX) in Chalk River, Ontario.

To date, over 35 million cancer patients globally have benefited from this groundbreaking Co-60 technology that was first pioneered in Ontario over 70 years ago.

Today, Canada remains the leader in Co-60 production, with over half the global demand produced in our CANDU reactors. Nordion, based in Ontario, is responsible for processing the majority of the global Co-60 supply on the marketplace today and ships Co-60 to more than 40 countries around the world.



References

Canadian Nuclear Isotope Council. (2023). *Isotopes for Hope: Canadian Leadership Needed Now More Than Ever*. <https://s45591.pcdn.co/wp-content/uploads/2023/04/CNIC-Isotopes-for-Hope.pdf>

London Health Sciences Centre. (2011). *Celebrating the 60th anniversary of the world's first cancer treatment with Cobalt-60 radiation*. <https://www.lhsc.on.ca/about-lhsc/celebrating-the-60th-anniversary-of-the-worlds-first-cancer-treatment-with-cobalt-60>

Nordion. (2025). *Setting the record straight on Cobalt-60: FAQs about Cobalt-60*. <https://www.nordion.com/wp-content/uploads/2025/06/Cobalt-60-eBook.pdf>

Nordion. (2025). *Co-60 Supply*. <https://www.nordion.com/wp-content/uploads/2025/06/Cobalt-60-eBook.pdf>

Taylor, A. (2017). This “Bomber” Actually Saved Countless Lives. *University of Toronto Magazine*. <https://magazine.utoronto.ca/campus/history/this-bomber-actually-saved-countless-lives-harold-johns-cobalt-60-cancer-therapy/>