

Nuclear Medicine in Australia: a Joint Health Sector Position Statement

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Nuclear medicine involves the use of radioisotopes for the diagnosis and treatment of medical conditions. Significant concerns exist within the Australian community and amongst health professionals and scientific experts regarding current research reactor based production and the Commonwealth Government's position regarding the disposal of these radioisotopes. On the basis of current information, we, the undersigned members of the health sector, recommend that the nuclear medicine industry in Australia undergo a full independent inquiry.

POSITION Time for a change

Overseas practice shows that it is feasible for radioactive isotopes to be supplied through non-reactor sources. The Canadian Government has recently decided to support research and development in expanding non-reactor based isotope production (using particle accelerators) and that the development of a new research reactor could not be justified on the grounds of isotope production¹.

By diversifying the sources of isotope production greater certainty in access to isotopes will be achieved whilst simultaneously reducing the health risks associated with the operation of nuclear research reactors.

The production of radioactive isotopes for nuclear medicine comprises a small percentage of the output of research reactors. The majority of the waste that is produced in these facilities occurs regardless of the nuclear medicine isotope production. Linking the need for a centralized radioactive waste storage facility with the production of isotopes for nuclear medicine is misleading.

RECOMMENDATIONS

Taking into consideration the information in this document, we, the undersigned, recommend that in order to facilitate accurate and informed public comment and debate there be a full independent Inquiry into:

1) Radioisotope production

- Assessing non-reactor based isotope production through examining Canada's recent decision to shift towards particle accelerator generation of its major medical radioisotopes and similar initiatives around the world, including Belgium and Germany;
- Exploring Australia's capacity to utilize current facilities to research, develop and produce our isotopes in particle accelerators; and
- Assessing necessary infrastructure requirements to ensure economic viability of a non-reactor based isotope industry.

2) Nuclear medicine waste disposal

- Establishing the number and type of nuclear medicine procedures being performed annually and the number of Australians on whom these procedures were performed.
- Quantifying the true volume and nature of medical waste presently in storage and the expected volume in the future;
- Investigating whether hospitals and research institutions can continue to store this waste indefinitely, especially if Australia shifts away from reactor derived radioisotopes; and
- Establishing the importance of the nuclear medicine waste stream to the proposal to establish a centralized Commonwealth waste storage facility.

We call for this inquiry to be undertaken before any further actions are taken to advance the construction of a federal radioactive waste dump in Australia.



Medical Association for Prevention of War
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Public Health Association
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BACKGROUND

Application of radioisotopes in medicine

- Nuclear medicine relies on the ionising radiation released by radioisotopes.
- Ionising radiation is harmful to living organisms, and its use should be minimized, considering potential benefits and risks in every application.
- The overwhelming majority of nuclear medicine procedures performed are for diagnostic purposes.

Radioisotope production

- The radioisotopes used in nuclear medicine are produced either by nuclear reactors or by particle accelerators such as cyclotrons. Australia presently utilises both technologies. Australia also draws on the international market for importation.
- Reactor derived radioisotopes require uranium - and therefore the uranium industry - for their manufacture.
- Reactor and uranium-based nuclear medicine engenders significant problems - namely, long-term public health and environmental risks, and the repeatedly-demonstrated connection between the use of 'research' reactors and weapons programs.
- Cyclotron derived radioisotopes do not require uranium and have substantially lower adverse health implications associated with their production and disposal, including a much-reduced waste stream.
- The Canadian Government, after an inquiry, has recently committed funding to explore the generation of its major medical radioisotope via cyclotrons and other non-reactor facilities.

Waste incurred from medical radioisotopes

- Despite claims of senior Commonwealth Ministers, a Commonwealth waste dump is not required for Australia to continue to provide nuclear medicine procedures.
- The majority of waste produced from medical radioisotopes decays almost entirely in a few days and is then classified as exempt waste (EW) which can be disposed of in the existing general environmental waste systems. The vast bulk of the remainder is 'very low level waste' (VLLW) which similarly does not require a specific waste repository and usually can be disposed of by the user in landfill. Only a small fraction of the balance is 'low level waste' (LLW) requiring only specific shallow burial, and does not require dedicated storage at a Commonwealth repository.
- An extremely small amount of medical waste is designated 'intermediate level waste' (ILW) and is presently safely stored at hospitals and research facilities.
- A nuclear reactor creates highly radioactive spent fuel rods as waste. The nuclear reactor at Lucas Heights (OPAL) is predominantly a research reactor. Radioisotope production therefore only accounts for a small proportion of its waste. An agreement is in place to have spent fuel rods generated by the new OPAL reactor at Lucas Heights to be processed and stored in the USA, since the fuel rods it uses are designated 'USA obligated fuel.' This agreement however expires in 2015 unless it is renewed. The current waste Australia will be receiving from Europe in the next few years is derived from the old, decommissioned HIFAR reactor which used French fuel rods.
- The production of radioisotopes by particle accelerators does not produce waste that would require storage at a specific repository.

Signed

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¹ The Report can be found at <http://nrcan.gc.ca/eneene/sources/uranuc/pdf/isotopes-gc-re-eng.pdf>