

Radioisotopes In Medicine & Industry

Highlights

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One of the major, but lesser known, side benefits Canadians and the world receive from the Canadian nuclear energy program has been in the production of radioisotopes for use in the field of nuclear medicine and in industry.

Elements are identified by their atomic structure; i.e. the number of protons and neutrons in their nucleus. Some elements have unstable forms, that is, they have an extra proton or neutron. These are known as radioisotopes. As they move spontaneously to become stable, they give off radiation, which can be used for a variety of purposes. Some radioisotopes, like radon, are naturally occurring, some are man-made, such as Cobalt 60.

The major Canadian producer of radioisotopes is MDS Nordion of Kanata. For 35 years, Cobalt 60 has been manufactured in special research reactors at the Chalk River facilities of Atomic Energy of Canada Ltd. (AECL). The Chalk River company manufactures medical isotopes under contract to MDS Nordion.

Nuclear Medicine

Perhaps the greatest value of radioisotopes has been in the field of nuclear medicine, where they have saved tens of thousands of lives. The earliest and still most effective treatment of cancer is radiation therapy using Cobalt 60. The first radiation therapy machines were invented in Canada in the 1950s and Canada is the worlds leading supplier of this isotope, supplying about 80% of global demand.

In addition to Cobalt 60, MDS Nordion also produces radioisotopes that are essential in diagnostic therapy. Some can be mixed chemically with other substances and injected into the body to allow physicians to "see" into the body, even the brain, lungs and organs that hitherto were inaccessible. Not only have these diagnostic techniques eliminated the need for much exploratory surgery, they have provided physicians with



The Canadian Nuclear Workers' Council is comprised of Locals for the following organizations: *Canadian Union of Public Employees*Communications, Energy & Paper Workers Union*International Association of Firefighters*International Association of Machinists & Aerospace Workers*International Brotherhood of Electrical Workers*Office & Professional Employees International Union*Power Workers' Union*Professional Institute of the Public Service*Public Service Alliance of Canada*United Steelworkers of America*

diagnostic capabilities that would otherwise have been impossible. Mild irradiation is also used to sterilize many medical supplies and some pharmaceuticals.

Industry

Radioisotopes have a wide variety of uses in industry. They are used where very fine measurement is required, to examine welds in pipelines, in fire detectors and air purifiers and in the manufacture of such products as polyethylene foam and some electrical wires and cables.

Food & Agriculture

Irradiation can be used on some plants to produce species which are more resistant to disease and weather. It can also be used for the extermination of insects which damage crops and to preserve crops in storage. Irradiation also makes it possible to extend the shelf life of some foods, thus eliminating the need for chemical additives without affecting the product's taste or quality.