South Africa grows share of global nuclear medicine market

Johannesburg, 04 August 2017. Following the exit of a Canadian producer of key medical radioisotope molybdenum-99 (Mo-99), South African company NTP Radioisotopes has stepped into the supply gap and increased its global market share.

The global nuclear medicine market, which includes radioisotopes and medical equipment, was valued at over US$11-billion in 2016, and is now projected to reach nearly US$20-billion by 2021.

Nuclear medicine uses tiny amounts of radioactive isotopes (radioisotopes), mostly for medical imaging to view the structure and function of organs, bone, tissue or systems in the human body. Imaging obtained from nuclear medicine often allows disease to be identified at a much earlier stage, while therapeutic applications of medical radioisotopes allow for targeted, non-invasive treatment.

South Africa currently has the largest body of nuclear medicine practitioners and nuclear medicine centres in sub-Saharan Africa, including nuclear medicine departments at 12 tertiary state hospitals.

Globally, demand for nuclear medicine is being driven by increases in the incidence of cancers and cardiovascular disease, and by the growing number of new applications for medical radioisotopes including the study of neurological and psychiatric diseases. Medical radioisotopes are used in a number of branches of medicine including oncology, cardiology, neurology, and endocrinology specifically thyroid conditions. Around 90% of all nuclear medicine procedures performed each year are for diagnosis or evaluation.

Underpinning this market is one key medical radioisotope: molybdenum-99 (Mo-99). The daughter product of Mo-99, technetium-99m (Tc-99m), is used in over 40 million nuclear medicine procedures every year. [See below for more]

There are currently fewer than five sites in the world capable of producing commercial volumes of Mo-99. Pelindaba-based South African company NTP Radioisotopes, a subsidiary of Necsa, is one of these; and currently, with global partnership agreements, supplies between a quarter and a third of the entire global demand of Mo-99. The group’s role has become even more significant with the 2016 exit of the Canadian NRU reactor from production.

NTP has been one of the top three global producers of Mo-99 for some time, and posted group revenues of over R1,2-billion for the 2015/16 financial year – almost R1-billion of which came from the sale of medical radioisotopes and radiopharmaceuticals. The state-owned company expects to exceed this figure for 2016/17. “We have managed to grow our market share for Mo-99 through continued investment in our production, and by working with our partners to cover the supply gap,” explains Precious Hawadi, NTP Group Executive: Finance.

The group has a market footprint covering 50 countries around the world, and is also a significant earner of foreign exchange for South Africa.
NTP Group MD Tina Eboka explains that the group’s success has been built on “excelling in manufacturing, processing and moving an extremely time-sensitive radiochemical to our customers around the world. What NTP does is, it provides the foundational material for a global, multi-billion dollar nuclear medicine industry. And there are only a few companies in the world that can do what we do. Without South Africa’s contribution to nuclear medicine, the whole health system could not function.”

NTP is also one of only a few vertically integrated medical radioisotope manufacturers in the world, and plays an even more unique role in South African manufacturing where it acts as both primary producer and beneficiator of its product. NTP’s advanced manufacturing capabilities and pioneering technology have even been exported to other countries. South Africa’s proprietary process for the use of low-enriched uranium in the production of Mo-99 has been licensed to the Australian Nuclear Science and Technology Organisation (ANSTO), which is also one of NTP’s key partners.

The Molybdenum-99 value chain

Mo-99 is produced through a process of nuclear fission inside a nuclear reactor and has a half-life of 66 hours, meaning it cannot be stockpiled and has to constantly be manufactured in fresh batches.

Mo-99 decays into a ‘daughter’ isotope called technetium-99m (Tc-99m), which is the most common diagnostic medical radioisotope in the world, used in over 40 million nuclear medicine procedures each year. Tc-99m has a half-life of just six hours, making it safe for use, and emits low-energy gamma rays that are ideally suited for imaging using gamma cameras such as those used in SPECT (single-photon emission computed tomography) imaging.

Because of the short half-lives of the radioisotopes, nuclear medicine practitioners use something called a Tc-99m ‘generator’ – this is a medical device that contains a feedstock of Mo-99, from which specific doses of Tc-99m can be eluted as required. The Tc-99m is then labelled with specific pharmaceutical agents (creating a ‘radiopharmaceutical’), that targets specific areas or systems in the body. The labelled Tc-99m is injected into the patient and, as it travels through the body, it gives off a small amount of gamma radiation that can be seen by gamma cameras.

Unlike X-rays, nuclear medicine enables practitioners to observe organs and systems as they function, right down to a molecular level. The same labelling technology also allows nuclear medicine practitioners to treat certain conditions using medical radioisotopes.

NTP Radioisotopes manufactures two other medical radioisotopes, iodine-131 (I-131) and beta-emitter lutetium-177 n.c.a. (Lu-177), which have both diagnostic and therapeutic applications. NTP also produces a number of non-reactor based medical radioisotopes, and pioneered the use of cyclotron-based FDG F-18 in South Africa, which is used for cancer diagnosis.
About NTP Radioisotopes
NTP Radioisotopes SOC Ltd is a subsidiary of the South African Nuclear Energy Corporation (Necsa) and is a leading manufacturer and supplier of radiation-based products and services including essential medical radioisotopes. This proudly South African corporate citizen is situated at Necsa’s nuclear facility at Pelindaba west of Pretoria, and serves customers in 50 countries around the world. NTP has strategic partners and associates ranking among the world’s leading providers of nuclear technology products, nuclear imaging services, and pharmaceutical producers and suppliers.

For more information on NTP Radioisotopes SOC Ltd visit: www.ntp.co.za