

**Submission
No 266**

**INQUIRY INTO HEALTH OUTCOMES AND ACCESS TO
HEALTH AND HOSPITAL SERVICES IN RURAL,
REGIONAL AND REMOTE NEW SOUTH WALES**

Organisation: Australian Nuclear Science and Technology Organisation
(ANSTO)

Date Received: 16 December 2020



16 December 2020

Committee Chair
Hon Greg Donnelly MLC
E: portfoliocommittee2@parliament.nsw.gov.au

Dear Mr Donnelly,

The Australian Nuclear Science and Technology Organisation (ANSTO) welcomes the opportunity to provide a submission to the Portfolio Committee No. 2 – Health inquiry into health outcomes and access to health and hospital services in rural, regional and remote New South Wales.

ANSTO plays a critical role in Australia's healthcare system through manufacturing medicine for cancer diagnosis and therapy, contributing to clinical trials, and undertaking and facilitating research and development (R&D) to advance treatment and diagnostic options. ANSTO is home to Australia's world-leading nuclear science and technology infrastructure – in particular, Australia's Open Pool Australian Lightwater (OPAL) multi-purpose reactor. ANSTO also operates the ANSTO Nuclear Medicine (ANM) Manufacturing Facility and the Nuclear Medicine Production Facility on which Australia's domestic nuclear medicine manufacturing capability relies.

This submission outlines ANSTO's role in the manufacture and supply of radioisotopes to rural customers, specific challenges and barriers to access within the radiopharmaceutical supply chain for these customers, and the measures put in place by ANSTO to deliver better health outcomes for rural and regional New South Wales.

Manufacturing and Supplying Radiopharmaceuticals

ANSTO is a manufacturer, sponsor and distributor of prescription medicine for both diagnostic and therapeutic radiopharmaceuticals, including sterile intravenous products, oral capsules and solutions. ANSTO, in many cases, is the only Australian manufacturer and supplier of these important nuclear medicines.

The manufacture of these nuclear medicine-based products relies on the OPAL reactor and is undertaken within ANSTO's nuclear medicine manufacturing facility (known as the ANM facility) and Nuclear Medicine Production Facility (also referred to as Building 23). These facilities are located in Lucas Heights, a suburb approximately 22km south of Sydney.

ANSTO produces molybdenum-99 (Mo-99), which is dispensed into Technetium-99m Gentech® Generators for use domestically, where it decays to technetium-99m (Tc-99m). Gentech® Generators are highly specialised containers used for the safe transportation and clinical administration of Tc-99m. Tc-99m is the most commonly used nuclear medicine in the world, and is used to diagnose a wide range of illnesses, including cancers, heart disease and neurological disorders.

ANSTO supplies more than 12,500 patient doses of nuclear medicines to over 250 hospitals and medical practices across Australia every week. Approximately one-third of these doses are delivered to customers located in rural and regional areas. ANSTO supplies nuclear medicine products to approximately 25 rural and regional hospitals and radiopharmacies in New South Wales.

Challenges in supplying nuclear medicines

The shelf-life (expiry period) of a nuclear medicine depends primarily on the physical half-life of the radioisotope it contains.

Many nuclear medicines contain radioisotopes with very short half-lives and therefore, have very short shelf-lives prior to expiration (radioactive decay causes the radioactivity in a nuclear medicine to decrease to an extent where insufficient radioactivity remains to serve the specific diagnostic or therapeutic purpose). In addition, chemical or radiation decomposition may have reduced the purity of the nuclear medicine to an unacceptable extent.

Radioactive decay presents significant supply chain and end-use challenges, particularly for customers located in rural and/or remote areas. For example, ANSTO currently imports cyclotron-produced Iodine-123 metaiodobenzylguanidine (MIBG) from Japan (ANSTO ceased production of this product with the closure of the National Medical Cyclotron in 2009). Iodine-123 MIBG is used in the diagnosis and monitoring of neuroblastomas in paediatric patients and has a very short half-life (13 hours). As such, it must be manufactured the day before it arrives into Australia and an ANSTO Health team member meets the aircraft carrying the radiopharmaceutical immediately upon its arrival for subsequent delivery to customers. It is then used over the course of the same afternoon and evening by clinicians and health-

care providers. Deliveries into rural and regional areas are therefore unable to be provided in time for effective use. Rural and regional patients in need of neuroblastoma imaging procedures are therefore unfortunately required to travel to urban hospitals and health clinics for access to Iodine-123 MIBG.

This is one particular example of a barrier to access for patients in rural and remote areas that is derived from the time-critical nature of nuclear medicines.

Mitigating these challenges

ANSTO has been a manufacturer and supplier of nuclear medicines for over fifty years and has worked to improve the effectiveness of its supply chain to help ensure its nuclear medicine products are provided to customers as expediently as possible for maximum utilisation. Whilst the challenge of radioactive decay cannot be completely eliminated, ANSTO has sought to ensure access for regional and rural patients to the maximum possible extent. Strategies include:

- (i) ANSTO devotes considerable effort to building and strengthening its logistics operations, working closely with airlines and road transport companies to minimise the possibility of delays in transport.
- (ii) ANSTO provides a diverse range of nuclear medicine products suitable for regional and remote settings. For example, ANSTO manufactures a range of Gentech® Generator sizes, ranging from 20 Gigabecquerels (GBq) – 370 GBq.¹ This ensures that regional customers with a lower patient throughput can purchase generators with less activity and therefore, less patient doses, reducing the price and reducing wastage.
- (iii) ANSTO calibrates the activity of its Gentech® Generators with reference to the anticipated time of delivery. This is particularly beneficial for clinicians and healthcare providers in rural and regional settings, as it enables clinicians to know the actual dose their generator will contain upon receipt, irrespective of radioactive decay in transit.
- (iv) ANSTO strives to limit the impact to patient procedures where possible by delivering nuclear medicine products to patients ahead of time in rural settings. For example, Iodine-131 capsules used for the treatment of hyperthyroidism (which have a longer half-life than some

¹ The activity of a quantity of radioactive material.

other nuclear medicines) are delivered to rural settings early on the Friday prior to the intended use for the following Monday, to ensure there are minimal patient impacts.

Finally, ANSTO is committed to supporting people who live in rural, regional and remote areas in having equitable access to the health products and services. On occasions when supply is disrupted, ANSTO works with a nuclear medicine working group to help ensure equitable nuclear medicine supply to regional and rural communities. This working group consists of representation from the Rural Alliance in Nuclear Scintigraphy (RAINS), the Australian and New Zealand Society of Nuclear Medicine (ANZSNM), the Australasian Association of Nuclear Medicine Specialists (AANMS), NSW Health, the Therapeutic Goods Administration and Global Medical Solutions (GMS). The organisation welcomes the opportunity to continue to work with Government, clinicians and other healthcare providers to continue to improve the delivery of health outcomes in New South Wales.

Thank you for the opportunity to contribute to this health inquiry. Should the Committee have any inquiries in relation to ANSTO's submission, please do not hesitate to contact me on _____ or government.liaison@ansto.gov.au.

Yours sincerely

Steve McIntosh
Senior Manager, Government and International Affairs
ANSTO