

## Australian Nuclear Medicine Traceability Program (ANMTP)

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**1. What is the Australian Nuclear Medicine Traceability Program (ANMTP) and why is it important?**

ANSTO Radionuclide Metrology (RM) has been working with the nuclear medicine peak body, the Australian and New Zealand Society of Nuclear Medicine (ANZSNM), to determine ongoing requirements for radionuclide metrology services within the nuclear medicine community. ANMTP can provide nuclear medicine practices with technical traceability to the Australian standard for important nuclear medicine based radionuclides to assist with regulatory compliance. One of the main objectives of the program is to improve the health outcomes of patients receiving nuclear medicine treatments through the more precise administration of nuclear medicine.

**2. Who is responsible for the administration of reliable, accurate radiopharmaceutical doses to patients?**

The responsibility for administration of reliable, accurate radiopharmaceutical doses lies with the individual nuclear medicine practice. ANMTP offers a means to establish direct traceability to the Australian standard for the activity of radionuclides which forms part of standard quality control procedures that should be developed and adhered to by nuclear medicine practices.

**3. Who should participate in ANMTP?**

The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) recommends annual accuracy testing of dose calibrators with Radioactivity Standards as part of standard quality control procedures. It is a requirement that the calibration of dose calibrators is traceable to a national standard, and the Australian standard is held by ANSTO. ANMTP participants will be supplied with Radioactivity Standards (RSs) every year. By offering this service as a coordinated national program, ANSTO is able to minimise the overall cost to participants.

**4. How much will ANMTP cost?**

By running ANMTP as a coordinated national program, ANSTO is able to reduce the production costs of RSs. Therefore, participating nuclear medicine practices will have access to radionuclide metrology services at a reduced rate.

**5. What is offered in ANMTP?**

- Access to Radioactivity Standards (RSs)
- A visit to your facility by a trained and competency assessed ANSTO Radionuclide Metrologist
- A measurement report
- A certificate of traceability to the Australian standard for the activity of radionuclide

**6. When is ANMTP happening?**

ANMTP takes place between October and December and operates on a state-by-state basis. We will confirm the exact date and time of each participant's appointment before the program commences.

**7. Who will perform the measurements?**

An ANSTO Radionuclide Metrologist will attend your practice and perform a series of measurements on your dose calibrator using RSs.

## **8. What is the measurement protocol?**

Measurements for this program will be performed using RSs provided by ANSTO. Measurements will be recorded on a tablet computer via a customised app and submitted to ANSTO for analysis and reporting. Participants will receive a measurement report of the findings once the analysis of their dose calibrator data has been completed.

The measurements will be carried out in the following manner:

- 10 measurements will be performed in the dose calibrator, removing, and replacing the source between each measurement.
- 10 measurements will be performed in the dose calibrator, without removing the source between measurements.

Measurements will be repeated for each RS (e.g. a total of 20 measurements for each RS on each dose calibrator).

## **9. How long will the measurements take?**

An ANSTO Radionuclide Metrologist will require access to your dose calibrator for approximately 30 minutes to perform the measurements. The entire appointment should take no more than 45 minutes. If you have more than one dose calibrator you may require a longer appointment.

## **10. How often should the measurements be repeated?**

ANMTP will run annually with rotating RSs for the most used medical radionuclides. Additional or specialised RSs can be supplied separately upon request for an additional cost.

## **11. What is required of participants?**

You will need to provide access to your facility and your dose calibrator for the duration of your appointment. Your dose calibrator will need to be turned on at least an hour before the scheduled appointment. The area where your dose calibrator is located will need to be checked for any hazards (radiation or other) before the scheduled appointment. A staff member with experience in using the dose calibrator to measure patient doses will need to be on hand to assist if necessary and provide any relevant information on the typical usage and maintenance of your dose calibrator.

## **12. What are stability measurements?**

Stability measurements are repeated measurements performed using a long-lived source (e.g. Cs-137) to check counting precision of a dose calibrator. A stability measurement should be performed each working day as recommended by the ARPANSA Safety Guide to Radiation Protection in Nuclear Medicine, and the variation in daily measurements over a 12-month period provides an estimate of the stability of the dose calibrator response over time. For more information on stability measurements please refer to the [ARPANSA Safety Guide to Radiation Protection in Nuclear Medicine](#) or contact [Radionuclide Metrology](#).

## **13. What are linearity measurements?**

Linearity measurements are performed using a short-lived source (e.g. Tc-99m) with an activity at least as high as the maximum activity measured at the practice. Measurements are repeated at regular intervals as the source decays to determine any non-linearity of the dose calibrator response over the full range of activity used at the practice. Linearity measurements should be performed at least annually. For more information on linearity measurements please refer to the [ARPANSA Safety Guide to Radiation Protection in Nuclear Medicine](#) or contact [Radionuclide Metrology](#).

## **14. Which standards can Radionuclide Metrology provide?**

Various RS will be distributed annually. Technetium-99m and I-131 will be offered each year and additional radionuclides will be offered on a rotating basis according to availability and demand. ANSTO is working in conjunction with ANZSNM to devise a schedule of other RSs in the following years. RSs for radionuclides not offered as part of ANMTP can be provided upon request at any time for an additional cost. If there are any radionuclides you would like to see included in ANMTP, please contact Radionuclide Metrology via [email](#) or [Send us Feedback Survey](#).

**15. Who fixes any problems that are identified?**

ANMTP provides a means to establish measurement traceability to the Australian standard for the activity of radionuclides. The responsibility for correct maintenance and operation of a dose calibrator lies with the individual nuclear medicine practice. Servicing of a dose calibrator to address faults or large discrepancies detected during ANMTP measurements or analysis remains the responsibility of the nuclear medicine practice. Guidelines on dose calibrator maintenance can be found in the [ARPANSA Safety Guide to Radiation Protection in Nuclear Medicine](#) and RM can offer advice to ANMTP participants.

**16. What happens to the information gathered by ANSTO?**

Information gathered by ANSTO will be used to carry out assessments on dose calibrators and provide participants with accurate reports and certification. Measurement data will also be used to compile a nationwide assessment of dose calibrator performance in Australia, however data will be used anonymously and results will not be attributed directly to individual nuclear medicine practices. For more information please refer to the [ANSTO Privacy Policy](#).

**17. How is ANMTP different to calibration programs offered by others?**

ANSTO maintains the primary and secondary standard for the activity of radionuclides in Australia, and is therefore able to provide direct traceability to the Australian standard.

**18. How does ANMTP fit in with previous dose calibrator surveys?**

The Technical Standards Committee of ANZSNM has carried out regular dose calibrator surveys using calibration sources supplied by ANSTO since the 1990s. The last survey was carried in 2009-2010. In recent years, ANSTO has been working in consultation ANZSNM to develop ANMTP as an ongoing annual program which will provide traceability to nuclear medicine practices all over Australia.

**19. Will ANMTP be available in New Zealand?**

ANMTP will be offered to Australian nuclear medicine practices initially, and ANSTO anticipates offering an equivalent service to practices in New Zealand in the future. Currently, RSs can be ordered at any time by New Zealand practices by contacting [Radionuclide Metrology](#).

**20. What is ANSTO's role in radionuclide metrology?**

ANSTO maintains the Australian standard for the activity of radionuclides by Authorisation of the Chief Metrologist of the National Measurement Institute (NMI) under the National Measurement Act 1960. ANSTO is a member of the Consultative Committee for Ionizing Radiation (CCRI): Section II Measurement of Radionuclides which sets the international standard for the activity of radionuclides within the Metre Convention. ANSTO is also a member of the Technical Committee for Ionizing Radiation (TCRI) of the Asia Pacific Metrology Programme (APMP) and the International Committee for Radionuclide Metrology (ICRM). As the national authority on radioactivity standards, ANSTO is authorised to provide

certificates demonstrating traceability to the Australian standard for the activity of radionuclides to its users.

## **21. What is ANSTO Radionuclide Metrology?**

The technical function for measuring radionuclides is housed at ANSTO within Radionuclide Metrology. Radionuclide Metrologists employ unique, highly specialised radiation detection techniques to carry out precise measurements of radioactivity without reference to a calibration. RM has the facilities and capabilities to perform accurate primary standardisations of various radionuclides. The primary standards are transferred to the RM Secondary Standard Ionisation Chamber in the form of radionuclide specific calibration factors. These calibrations make up the Australian secondary standards of activity of radionuclides and are used to produce Radioactivity Standards (RSs).

## **22. What is a Radioactivity Standard (RS)?**

A RS is a reference material that has been certified with traceability to the Australian national standard for radioactivity. A RS can be used by nuclear medicine practices to achieve traceability to the Australian standard for radioactivity for the specific radionuclide and measurement geometry.

If you have any further questions, please submit them to [Radionuclide Metrology](#).