



Australasian Association of Nuclear Medicine Specialists Position Statement: Technetium-99m: Priorities and Substitutions June 2026

Preamble

Over the last few years, Australia has intermittently faced critical supply disruption of Technetium 99m (Tc-99m). This is a crucial component in around 50% of nuclear medicine studies in Australia and 97% of non-PET studies. Nuclear Medicine is a specialised branch of imaging that utilises radioisotopes for imaging of functional processes in the body. For example, an X-ray shows the structure of a bone, a bone scan shows how on a cellular level, the bone is reacting to disease. This provides insights into the pathology and disease progress, which are not readily available from pure anatomic imaging modalities like X-rays.

Technetium-99m production involves several steps. It is a daughter product that is derived from Molybdenum-99 (Mo-99). The Mo-99 in Australia starts production in ANSTO's OPAL reactor located in Lucas Heights on the outskirts of Sydney. After OPAL, the Mo-99 is extracted and processed in the new Mo-99 manufacturing facility, opened at ANSTO in 2019. The Mo-99 then goes to ANSTO's Tc-99m generator production facility to be packaged into a shielded container that is easier and safer to transport to nuclear medicine hospitals and clinics around Australia and New Zealand. These three steps all have no local redundancy and therefore are all potential single points of failure. A new generator manufacturing facility at Lucas Heights is being developed in stages and when completed will improve the reliability of technetium supply across Australia and NZ.

Nuclear medicine provides services largely to oncology patients but has a significant role in all areas of medicine including infection management and monitoring transplant patients. Whilst some studies can be deferred, or alternatives used in the short term, these options are not viable long-term, therefore re-establishment of supply is crucial post any outages in the three facilities ANSTO uses in the production of Tc-99m. Several hundred thousand studies are done each year using Tc-99m. When Tc-99m is limited, emergency patients are prioritised, but the longer a shortage continues, the need for a scans becomes more urgent as patient diagnosis management and treatment cannot be indefinitely delayed.

The AANMS has considered what substitutions and prioritisation would be beneficial during times of supply disruption, and these are detailed in the following tables:

Table 1: Technetium-99m priority studies WITHOUT good alternatives

The studies with their indications below have no reasonable substitutions available. Where other Tc-99m based studies can be substituted, these indications should receive a higher priority for Tc-99m supply.

MBS Item (s)	Scan	Clinical scenario
61469	Lymphoscintigraphy	Sentinel node planning/lymphoedema
61313/14/16/17/56	GHPS	Prior to chemo/trial/where echo not available or appropriate
61360/61	Biliary scan	Acute pre-op/biliary leak/paediatric-biliary atresia
61386-93	Renal imaging	Pre-op/paediatric/transplant assessment (early)
61364	GI blood loss	Acute bleeding
	SIRT Work Up	Pre SIRT therapy
61328/40/48	V/Q scan	Young female/pregnant patient/contraindication to contrast/quantification pre surgery
61480	Parathyroid Study	Clinically urgent. 4D CT and Ultrasound
	Trial entry studies requiring specific Tc studies	Allow access to trial drugs/therapies
61449/61505	Myocardial Amyloid Study	Assess for cardiac amyloid to guide and monitor treatment
61368	Meckel's Diverticulum Study	Assess for occult gastro-intestinal bleeding
61413	CSF Shunt Study	Assess for CSF V-P shunt patency
61441	Bone Marrow Study	Correlation with labelled WBC scan for infection assessment
61402	ECD brain perfusion	Cerebral perfusion study with radiotracer administration during clinical seizure event

NOTES:

Any urgent Tc-99m study should get priority in the absence of a viable alternative.

The general definition of an urgent study is one that will result in an immediate detrimental patient management change. Local nuclear medicine specialists will be best placed to make determinations of patient priority in consultation with the referrer.

Regional sites without access to PET will need to use Tc-99m based radiopharmaceuticals if the alternative is PET based therefore these sites should be prioritised by ANSTO with the input of the Nuclear Medicine Working Group which includes a representative of AANMS, and other nuclear medicine related members.

Ideally the use of PET alternatives where possible will free up the supply of Tc-99m to allow it to be used elsewhere, particularly in regional centres.

Table 2: Potential substitutions for technetium-99m based studies

MBS items	Organ or condition	Scan description	Replacement option (nuclear medicine) <i>* subject to appropriate regulatory approval</i>	Replacement option (non-nuclear medicine)
61402	Brain	HMPAO/ECD brain perfusion	PET FDG	
61402	Brain	HMPAO brain death		Angiography
61302/61653	Cardiac	Stress/rest myocardial perfusion and viability	Tl-201 SPECT CTCA Cardiac PET	Stress echo/angiogram
61313-7	Cardiac	Gated heart pool scan		Echo
61328/40/48	Lung	V/Q		CTPA (if no contraindication)
61480	Parathyroid	Parathyroid adenoma	F18-FCH	4D CT F-18 fluorocholine (FCH)
61421-25	Skeleton	Staging malignancy	FDG-PET (PSMA-PET for prostate) or F18-NaF	MRI/CT
61421-25	Skeleton	Other	F18-NaF	MRI/CT
61473	Thyroid	Hyperthyroidism	I123 / I124	
61650	Labelled white cell scan	Infection	Gallium 67 or FDG-PET	MRI/CT
61386-93	Renal	Renal imaging		
12524/12527	GFR	Quantitative renal function	C51-EDTA	
61373/76/83	Stomach	Gastric emptying/reflux		Gastroscopy, esophageal manometry, barium studies

NOTES:

Scans without good viable alternative are listed in Table 1.

The alternatives are not always preferable to the existing radiopharmaceutical, and some will come with additional costs, time constraints and reporting times – particularly PET substitutions. Alternatives will also be subject to any relevant regulatory approvals.

The use of PET and other substitutions will increase availability of Tc-99m based radiopharmaceuticals to be used for indications in Table 2 and for use in areas without access to PET e.g. rural sites.

Some options are of limited availability requiring local expertise to make. This may have a role to play, particularly if the shortage is prolonged. As an example, fluorocholine for parathyroid imaging requires

expertise to produce and interpret. The mainstream solution for urgent parathyroid imaging will remain Tc-99m based pharmaceuticals.

Increased demand for non Tc-999m based products such as, but not limited to, fluorine-18, thallium-101 and gallium-67 will require planning for increased supply.

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