Australian Government
Australian Radiation Protection and Nuclear Safety Agency

arpansa

Proposed Revisions to the Australian National Diagnostic Reference Levels for Nuclear Medicine

General Nuclear Medicine

Table 1 Proposed DRLs for administered activity in general nuclear medicine procedures for adults. Where not otherwise specified, the pharmaceutical contains ^{99m}Tc. Where available, the current DRL is shown for comparison.

Category	Scan		Pharmaceuticals	Proposed DRL (MBq)	Current DRL (MBq)
Cardiovascular	Gated blood pool scan		Pertechnetate, RBCs	1000	1030
	MPI 1-day*:	1st phase (rest)	Tetrofosmin, MIBI	350	1520
		2nd phase (stress)	Tetrofosmin, MIBI	1150	
	MPI 2-day:	1st phase	Tetrofosmin, MIBI	600	620
		2nd phase	Tetrofosmin, MIBI	600	620
Endocrine	Thyroid		Pertechnetate	200	215
	Parathyroid:	without subtraction	MIBI	800	900
		with subtraction	MIBI	900	900
		thyroid subtraction	Pertechnetate	220	220
Gastrointestinal	Gastric emptying (solid phase)		Colloid, DTPA	40	44
	Colonic transit		^{67}Ga Citrate	20	20
Genitourinary	MAG3 Renal scan		MAG3	300	305
	DMSA Renal scan		DMSA	200	200
	Renal Imaging DTPA (not GFR)		DTPA	500	500
Hepatobiliary	Hepatobiliary		HIDA, DISIDA, Mebrofenin	200	210
Infection	Infection		^{67}Ga Citrate	220	220
Lymphatic	Sentinel node (breast)†:	Same day surgery	Colloid	40	52
		Delayed	Colloid	80	-
	Sentinel node (melanoma)†		Colloid	52	52
Nervous system	Brain		ECD, HMPAO	800	750
Pulmonary	Lung perfusion		MAA	220	240
Skeletal	Bone scan		MDP, HDP	900	920

*While the DRL reflects the most common approach reported in Australia (rest prior to stress), facilities that conduct the stress phase first appear able to deliver considerably lower dose.

† Quoted DRL is for the total dose delivered, not per injection. The most common approach reported was 4 x 10 MBq injections for same day surgery.

CT component of SPECT/CT

Table 2 Proposed DRLs for the CT component of SPECT/CT scans for adults. Where available, the current DRL is shown for comparison

Category	Region	Proposed $CTDI_{vol}$ DRL (mGy)	Proposed DLP DRL (mGy.cm)	Existing DLP DRL (mGy.cm)
Cardiac	Chest (heart)	2.1	50	45
Lymphatic (breast ca.)	Chest	3.8	135	170
Neurological	Brain	-	255	255
Parathyroid	Neck/Chest	7.2	240	255
Pulmonary	Chest (lung)	4.6	150	120
Skeletal	Single width	4.8	200	240
	Double width	4.8	365	415

$CTDI_{vol}$ – volume computed tomography dose index
DLP – dose length product

Positron Emission Tomography

Table 3. Proposed DRLs for administered activity in PET studies for adults. Where available, the current DRL is shown for comparison

Scan	Pharmaceutical	Proposed DRL		Current DRL MBq
		MBq/kg*	MBq	
Whole body†	^{18}F FDG	3.5	270	310
Parkinsonian/ Alzheimer's	^{18}F FDG	-	230	250
NETs	^{68}Ga DOTA-TATE	2.2	200	-
Prostate cancer	^{68}Ga PSMA	2.2	200	-
	^{18}F DCFPyL	3.7	270	-

* Variable DRLs only applicable for patients weighing between 50 and 120 kg.

† Includes scans conducted for oncology, infection, inflammation, vasculitis

CT component of PET/CT

Table 4 Proposed DRLs for the CT component of PET/CT for adults. Where available, the current DRL is shown for comparison

Region	Arm position	Proposed $CTDI_{vol}$ DRL (mGy)	Proposed DLP DRL (mGy.cm)	Current DRL (mGy.cm)
Brain vertex to prox./mid thighs	Up	4.2	430	540
	Down	5.3	555	
Brain vertex to toes	Up	3.9	675	985
	Down	4.6	825	
Brain	Down	-	325	325

$CTDI_{vol}$ – volume computed tomography dose index
DLP – dose length product