



Nuclear Medicine Diagnostic Reference Levels (DRLs)

General nuclear medicine

The 25th percentile, median and DRL doses are expressed in term of MBq, unless otherwise stated.

Category	Procedure Name	Nuclide	Chemical Form	Route of Admin.	25 th percentile	Median	DRL
Cardiac	Cardiac first pass	Tc-99m	Pertechnetate , Red cells	IV	590	875	930
	Cardiac L/R shunt	Tc-99m	Pertechnetate	IV bolus	400	550	900
	Cardiac R/L shunt	Tc-99m	MAA	IV	100	150	185
	Gated blood pool scan	Tc-99m	Red cells	IV	900	990	1030
	Myocardial hot spot	Tc-99m	PYP	IV	720	800	800
	MPI - Rest	Tl-201	Chloride	IV	80	115	120
	MPI - Stress	Tl-201	Chloride	IV	100	120	120
	MPI - Reinjection	Tl-201	Chloride	IV	30	40	40
	MPI - Single phase	Tc-99m	Tetrofosmin , MIBI	IV	350	475	620
	MPI - 1 day rest + stress	Tc-99m	Tetrofosmin , MIBI	IV	1250	1400	1520
	MPI - 1 day rest (²⁰¹ Tl)/stress (^{99m} Tc)	Tl-201	Chloride	IV	100	110	130
	Tc-99m	Tetrofosmin , MIBI	IV	900	1000	1050	

Note: dose is for both studies combined

Category	Procedure Name	Nuclide	Chemical Form	Route of Admin.	25 th percentile	Median	DRL
Endocrine	Parathyroid	Tc-99m	Tetrofosmin , MIBI	IV	765	820	900
	Parathyroid subtraction	Tc-99m	Pertechnetate	IV	45	75	220
	Thyroid	I-123	Iodide	IV	180	185	345
	Thyroid	Tc-99m	Pertechnetate	IV	200	210	215
Gastrointestinal	Blood loss	Tc-99m	Red cells	IV	800	1000	1000
	Colonic transit	Ga-67	Citrate	Oral	6	10	20
	Gastric emptying	Ga-67	Citrate	Oral	10	15	20
	Gastric emptying	Tc-99m	Colloid, DTPA	Oral	39	43	44
	Oesophageal reflux	Tc-99m	Colloid, DTPA	Oral	40	40	40
	Oesophageal transit	Tc-99m	Colloid, DTPA	Oral	20	40	40
	Small bowel transit	Tc-99m	Colloid, DTPA	Oral	20	40	40
	Meckel's diverticulum	Tc-99m	Pertechnetate	IV	225	400	400
	Salivary glands	Tc-99m	Pertechnetate	IV	150	185	200
Genitourinary	Renal cystogram	Tc-99m	Pertechnetate	Bladder	40	50	94
	Renal scan	Tc-99m	DMSA	IV	120	150	200
	Renal scan	Tc-99m	DTPA	IV	380	400	500
	Renal scan	Tc-99m	MAG3	IV	235	270	305
	Renal transplant	Tc-99m	DTPA, MAG3	IV	200	300	400
	Testicular scan	Tc-99m	Pertechnetate	IV	210	400	600
Haematological	Arterial infusion	Tc-99m	MAA	Intra-arterial	100	135	190
	Le Veen shunt	Tc-99m	Colloid	Intra-peritoneal	95	185	200
	Venogram	Tc-99m	Pertechnetate	IV	700	770	800
Hepatobiliary	Hepatobiliary	Tc-99m	HIDA, DISIDA, DIDA	IV	185	205	210
	Liver blood flow	Tc-99m	Red cells	IV	800	900	1000
	Liver/spleen	Tc-99m	Colloid	IV	150	200	200
	Liver transplant	Tc-99m	HIDA, DISIDA	IV	155	185	200

Category	Procedure Name	Nuclide	Chemical Form	Route of Admin.	25 th percentile	Median	DRL
Infection	Infection	Ga-67	Citrate	IV	185	200	220
	Infection	Tc-99m	WBC-colloid, WBC-HMPAO	IV	500	700	800
Lacrimal	Lacrimal drainage	Tc-99m	Pertechnetate	Eye drops	7	10	18
				<i>Note: dose is expressed in terms of drops per eye</i>			
Lymphatic	Lymphoscintigraphy	Tc-99m	Nanocolloid	Perilesional	33	42	52
				<i>Note: dose is for entire procedure, not per injection</i>			
Nervous System	Brain	Tc-99m	DTPA	IV	800	800	900
	Brain	Tc-99m	HMPAO, ECD	IV	640	720	750
	CSF leak	In-111	DTPA	Intrathecal	15	21.5	38
	CSF leak	Tc-99m	DTPA	Intrathecal	77	300	370
	CSF shunt patency	Tc-99m	Pertechnetate, DTPA	Cisternal	40	40	80
Oncology	Somatostatin receptors	In-111	Octreotide	IV	200	200	240
	Thyroid - wb scan for Ca	I-123	Iodide	Oral	190	310	400
	Thyroid - wb scan for Ca	I-131	Iodide	Oral	100	150	185
	Tumour	Ga-67	Citrate	IV	300	400	400
	Tumour	I-123	MIBG	IV infusion	200	290	400
	Tumour	I-131	MIBG	IV infusion	24	31	38
	Tumour	Tc-99m	MIBI	IV	740	800	800
	Tumour	Tc-99m	[V]-DMSA	IV	370	400	440
	Tumour	Tl-201	Chloride	IV	115	125	185
Pulmonary	Lung perfusion	Tc-99m	MAA	IV	200	220	240
Skeletal	Bone marrow	Tc-99m	Colloid, nanocolloid	IV	250	400	550
	Bone scan	Tc-99m	MDP, HDP	IV	810	840	920
Splenic	Liver/spleen - see Hepatobiliary						
	Spleen	Tc-99m	Denatured RBCs	IV	200	335	705

Category	Procedure Name	Nuclide	Chemical Form	Route of Admin.	25 th percentile	Median	DRL
Non-imaging	Breath test	C-14	Urea	Oral	0.037	0.037	0.037
	GIT blood loss	Cr-51	Red cells	IV	4	4	5.5
	Plasma volume	I-125	HSA	IV	0.2	0.25	0.5
	Red cell survival	Cr-51	Red cells	IV	4	6	7
	Red cell volume	Cr-51	Red cells	IV	1	2	4
	Renal GFR	Tc-99m	DTPA	IV	60	80	100
	Renal GFR	Cr-51	EDTA	IV	3	4	4

Nuclear medicine CT

The DRLs below are for CT scans conducted for the purposes of **attenuation correction or localisation** in conjunction with a SPECT scan.

Category	Region	25 th Percentile (mGy.cm)	Median (mGy.cm)	DRL (mGy.cm)
Cardiac	Chest	25	40	45
Lymphatic (Breast Ca.)	Chest	80	115	170
Neurological	Brain	45	225	255
Parathyroid	Neck/Chest	140	205	255
Pulmonary	Chest	70	95	120
Skeletal	Axial	115	170	240
	Axial (2 bed)	195	340	415

PET

Category	Pharmaceutical	25 th percentile (MBq)	Median (MBq)	DRL (MBq)
Body	F-18 FDG	225	250	310
Body (weight corrected)	F-18 FDG	2.5 x kg + 75	2.5 x kg + 100	2.5 x kg + 125
Brain	F-18 FDG	200	220	250

For information purposes only, the Ga-68 percentiles are shown below.

Category	Pharmaceutical	25 th percentile (MBq)	Median (MBq)	75 th percentile (MBq)
Ga-68	Dotatate/PSMA	150	150	190

PET CT

The DRLs below are for CT scans conducted for the purposes of **attenuation correction or localisation** in conjunction with a PET scan.

Region	25 th percentile (mGy.cm)	50 th percentile (mGy.cm)	DRL (mGy.cm)
Head/Brain	75	125	325
Whole body (Eyes - Thighs)	325	430	540
Whole body (Vertex - Toes)	495	655	985