

Paediatric Dosage

The EANM Dosimetry and Paediatrics Committees

1. General

It is important to enforce the as low as reasonably achievable (ALARA) concept during the radiopharmaceutical dose administration to paediatric patients. The EANM dosimetry and paediatrics committees introduce a condensed and revised version of a dosage card for most nuclear medicine diagnostic procedures in the paediatric population. This dosage card includes a set of minimum activities. The activities to be administered result in weight-independent effective doses to the children. The introduction of minimum activities guarantees a minimum standard of image quality throughout Europe and avoids a variety of administered activities in children of the same weight in different countries. The paediatric dosage should be adjusted on the basis of body weight. We recommend the use of paediatric dosage according to the EANM Dosage Card (Version 5.7.2016) publication.

2. Formula

$A[\text{MBq}]_{\text{Administered}} = \text{Baseline Activity} \times \text{Multiple}$

- For a calculation of the administered activity, the baseline activity value has to be multiplied by the multiples given below for the recommended radiopharmaceutical class.
- If the resulting activity is smaller than the minimum recommended activity, the minimum activity should be administered.
- The national diagnostic reference levels should not be exceeded.

3. Multiples of Baseline Activity

Weight (kg)	Class A	Class B	Class C
3	1	1	1
4	1,12	1,14	1,33
6	1,47	1,71	2,00
8	1,71	2,14	3,00
10	1,94	2,71	3,67
12	2,18	3,14	4,67
14	2,35	3,57	5,67
16	2,53	4,00	6,33
18	2,71	4,43	7,33

20	2,88	4,86	8,33
22	3,06	5,29	9,33
24	3,18	5,71	10,00
26	3,35	6,14	11,00
28	3,47	6,43	12,00
30	3,65	6,86	13,00
32	3,77	7,29	14,00
34	3,88	7,72	15,00
36	4,00	8,00	16,00
38	4,18	8,43	17,00
40	4,29	8,86	18,00
42	4,41	9,14	19,00
44	4,53	9,57	20,00
46	4,65	10,00	21,00
48	4,77	10,29	22,00
50	4,88	10,71	23,00
52-54	5,00	11,29	24,67
56-58	5,24	12,00	26,67
60-62	5,47	12,71	28,67
64-66	5,65	13,43	31,00
68	5,77	14,00	32,33

4. Recommended Amounts in MBq

Radiopharmaceutical	Class	Baseline activity (for calculation purposes only) MBq	Minimum recommended Activity MBq
¹²³ I (Thyroid)	C	0,6	3
¹²³ I Amphetamine (Brain)	B	13,0	18
¹²³ I HIPURAN (Abnormal renal function)	B	5,3	10
¹²³ I HIPURAN (Normal renal function)	A	12,8	10
¹²³ I mIBG	B	28,0	37
¹³¹ I mIBG	B	5,6	35
¹⁸ F FDG-PET	B	25,9	26
¹⁸ F FDG-PET brain	B	14,0	14
¹⁸ F Sodium-urid	B	10,5	14
⁶⁷ Ga Citrate	B	5,6	10
⁶⁸ Ga-labelled peptides	B	12,8	14
^{99m} Tc ALBUMIN (Cardiac)	B	56,0	80
^{99m} Tc COLLOID (Gastric Reflux)	B	2,8	10
^{99m} Tc COLLOID (Liver/Spleen)	B	5,6	15

^{99m} Tc COLLOID (Marrow)	B	21,0	20
^{99m} Tc DMSA	B	6,8	18,5
^{99m} Tc DTPA (Abnormal renal function)	B	14,0	20
^{99m} Tc DTPA (Normal renal function)	A	34,0	20
^{99m} Tc ECD	B	51,8	100
^{99m} Tc HMPAO (Brain)	B	51,8	100
^{99m} Tc HMPAO (WBC)	B	35,0	40
^{99m} Tc IDA (Biliary)	B	10,5	20
^{99m} Tc MAA / Microspheres	B	5,6	10
^{99m} Tc MAG3	A	11,9	15
^{99m} Tc MDP	B	35,0	40
^{99m} Tc Pertechnetate (Cystography)	B	1,4	20
^{99m} Tc Pertechnetate (Ectopic Gastric Mucosa)	B	10,5	20
^{99m} Tc Pertechnetate (Cardiac First Pass)	B	35,0	80
^{99m} Tc Pertechnetate (Thyroid)	B	5,6	10
^{99m} Tc RBC (Blood Pool)	B	56,0	80
^{99m} Tc SestaMIBI/Tetrofosmin (Cancer seeking agent)	B	63,0	80
^{99m} Tc SestaMIBI/Tetrofosmin2 (Cardiac rest scan 2-day protocol min)	B	42,0	80
^{99m} Tc SestaMIBI/Tetrofosmin2 (Cardiac rest scan 2-day protocol max)	B	63,0	80
^{99m} Tc SestaMIBI/Tetrofosmin2 (Cardiac stress scan 2-day protocol min)	B	42,0	80
^{99m} Tc SestaMIBI/Tetrofosmin2 (Cardiac stress scan 2-day protocol max)	B	63,0	80
^{99m} Tc SestaMIBI/Tetrofosmin2 (Cardiac rest scan 1-day protocol)	B	28,0	80
^{99m} Tc SestaMIBI/Tetrofosmin2 (Cardiac stress scan 1-day protocol)	B	84,0	80
^{99m} Tc Spleen (Denatured RBC)	B	2,8	20
^{99m} Tc TECHNEGAS (Lungventilation)	B	49,0	100

5. Website

http://www.eanm.org/publications/dosage_calculator.php?navId=285

6. Literature

- Jacobs F, Thierens H, Piepsz A, Bacher K, Van de Wiele C, Ham H, Dierckx RA. Optimized tracer-dependent dosage cards to obtain weightindependent effective doses. *Eur J Nucl Med Mol Imaging*. 2005 May; 32(5):581-8.
- M. Lassmann, S.T.Treves. Pediatric Radiopharmaceutical Administration: Harmonization of the 2007 EANM Paediatric Dosage Card (Version 1.5.2008) and the 2010 North America Consensus guideline, *Eur J Nucl Med Mol Imaging*. 2014, DOI: 10.1007/s00259-014-2731-9.
- Lassmann M, Biassoni L, Monsieurs M, Franzius C; EANM Dosimetry and Paediatrics Committees. The new EANM paediatric dosage card: additional notes with respect to F-18. *Eur J Nucl Med Mol Imaging*. 2008 Sep;35(9):1666-8. doi: 10.1007/s00259-008-0799-9. Epub 2008 Jun 24. Erratum in: *Eur J Nucl Med Mol Imaging*. 2008 Nov;35(11):2141.