

# Follow the new North American Guidelines for Pediatric Nuclear Medicine for high-quality images at low radiation dose.



## 2016 Update: North American Consensus Guidelines for Pediatric Administered Radiopharmaceutical Activities<sup>1</sup>

Radiopharmaceutical	Notes	Administered Activity	Minimum Administered Activity	Maximum Administered Activity
<sup>123</sup> I-MIBG	[A]	5.2 MBq/kg (0.14 mCi/kg)	37 MBq (1.0 mCi)	370 MBq (10.0 mCi)
<sup>99m</sup> Tc-MDP	[A]	9.3 MBq/kg (0.25 mCi/kg)	37 MBq (1.0 mCi)	
<sup>18</sup> F-FDG	[A, B]	Body: 3.7-5.2 MBq/kg (0.10-0.14 mCi/kg) Brain: 3.7 MBq/kg (0.10 mCi/kg)	26 MBq (0.7 mCi) 14 MBq (0.37 mCi)	
<sup>99m</sup> Tc-DMSA	[A]	1.85 MBq/kg (0.05 mCi/kg)	18.5 MBq (0.5 mCi)	100 MBq (2.7 mCi)
<sup>99m</sup> Tc-MAG3	[A, C] [A]	Without flow study: 3.7 MBq/kg (0.10 mCi/kg) With flow study: 5.55 MBq/kg (0.15 mCi/kg)	37 MBq (1.0 mCi)	148 MBq (4.0 mCi)
<sup>99m</sup> Tc-IDA	[A, D]	1.85 MBq/kg (0.05 mCi/kg)	18.5 MBq (0.5 mCi)	
<sup>99m</sup> Tc-MAA	[A] [A]	If <sup>99m</sup> Tc used for ventilation: 2.59 MBq/kg (0.07 mCi/kg) No <sup>99m</sup> Tc ventilation study: 1.11 MBq/kg (0.03 mCi/kg)	14.8 MBq (0.4 mCi)	
<sup>99m</sup> Tc-pertechnetate (Meckel diverticulum imaging)	[A]	1.85 MBq/kg (0.05 mCi/kg)	9.25 MBq (0.25 mCi)	
<sup>18</sup> F-sodium fluoride	[A]	2.22 MBq/kg (0.06 mCi/kg)	14 MBq (0.38 mCi)	
<sup>99m</sup> Tc (for cystography)	[E]	No weight-based dose	No more than 37 MBq (1.0 mCi) for each bladder filling cycle	
<sup>99m</sup> Tc-sulfur colloid (for oral liquid gastric emptying)	[F]	No weight-based dose	9.25 MBq (0.25 mCi)	37 MBq (1.0 mCi)
<sup>99m</sup> Tc-sulfur colloid (for solid gastric emptying)	[F]	No weight-based dose	9.25 MBq (0.25 mCi)	18.5 MBq (0.5 mCi)
<sup>99m</sup> Tc-HMPAO (Ceretek) / <sup>99m</sup> Tc-ECD (NeuroLite) for brain perfusion		11.1 MBq/kg (0.3 mCi/kg)	185 MBq (5 mCi)	740 MBq (20 mCi)
<sup>99m</sup> Tc-sestamibi (Cardiolite) / <sup>99m</sup> Tc-tetrofosmin (Myoview) for myocardial perfusion (single scan or first of 2 scans, same day)		5.55 MBq/kg (0.15 mCi/kg)	74 MBq (2 mCi)	370 MBq (10 mCi)
<sup>99m</sup> Tc-sestamibi (Cardiolite) / <sup>99m</sup> Tc-tetrofosmin (Myoview) for myocardial perfusion (second of 2 scans, same day)		16.7 MBq/kg (0.45 mCi/kg)	222 MBq (6 mCi)	1110 MBq (30 mCi)
Na <sup>123</sup> I for thyroid imaging		0.28 MBq/kg (0.0075 mCi)	1 MBq (0.027 mCi)	11 MBq (0.3 mCi)
<sup>99m</sup> Tc-pertechnetate for thyroid imaging		1.1 MBq/kg (0.03 mCi/kg)	7 MBq (0.19 mCi)	93 MBq (2.5 mCi)
<sup>99m</sup> Tc-RBC for blood pool imaging		11.8 MBq/kg (0.32 mCi/kg)	74 MBq (2 mCi)	740 MBq (20 mCi)
<sup>99m</sup> Tc-WBC for infection imaging		7.4 MBq/kg (0.2 mCi/kg)	74 MBq (2 mCi)	555 MBq (15 mCi)
<sup>68</sup> Ga-DOTATOC or <sup>68</sup> Ga-DOTATATE	[G]	2.7 MBq/kg (0.074 mCi/kg)	14 MBq (0.38 mCi)	185 MBq (5 mCi)

**NOTES:** This information is intended as a guideline only. Local practice may vary depending on patient population, choice of collimator, and the specific requirements of clinical protocols. Administered activity may be adjusted when appropriate by order of the nuclear medicine practitioner.

For patients who weigh more than 70 kg, it is recommended that the maximum administered activity not exceed the product of the patient's weight (kg) and the recommended weight-based administered activity. Some practitioners may choose to set a fixed maximum administered activity equal to 70 times the recommended weight-based administered activity, expressed as MBq/kg or mCi/kg, for example, approximately 10 mCi (370 MBq) for <sup>18</sup>F-FDG body imaging. The administered activities assume use of a low energy high-resolution collimator for <sup>99m</sup>Tc-radiopharmaceutical and a medium energy collimator for <sup>123</sup>I-MIBG.

Individual practitioners may use lower administered activities if their equipment or software permits them to do so. Higher administered activities may be required in selected patients. No recommended dose is given for intravenous <sup>67</sup>Ga-citrate; Intravenous <sup>67</sup>Ga-citrate should be used very infrequently and only in low doses.

[A] The EANM Dosage Card 2014 version 2 administered activity may also be used.

[B] The low end of the dose range should be considered for smaller patients. Administered activity may take into account patient mass and time available on the PET scanner. The EANM Dosage Card 2014 version 2 administered activity may also be used.

[C] The administered activities assume that image data are reformed at 1 min/image. The administered activity may be reduced if image data are reformed at a longer time per image.

[D] A higher administered activity of 1 mCi may be considered for neonatal jaundice.

[E] <sup>99m</sup>Tc-sulfur colloid, <sup>99m</sup>Tc-pertechnetate, <sup>99m</sup>Tc-DTPA or possibly other <sup>99m</sup>Tc radiopharmaceuticals may be used. There is a wide variety of acceptable administration and imaging techniques for <sup>99m</sup>Tc cystography, many of which will work well with lower administered activities. An example of appropriate lower administered activities is found in the 2014 revision of the EANM Paediatric Dose Card<sup>2</sup>.

[F] The administered activity may be based on patient weight or on the age of the child.

[G] The administered activity is based on the EANM Dosage Card 2014 version 22 dosage for a 60 kg patient, using the minimum and maximum doses from the EANM Dosage Card. There was little experience with this radiopharmaceutical in children in North America at the time of preparation of this dosage table.

<sup>1</sup>Gelfand MJ, Parisi MT, Treves ST. Pediatric Radiopharmaceutical Administered Doses: 2010 North American Consensus Guidelines. J Nucl Med 2011; 52(2):318-322.

<sup>2</sup>Lassmann M, Treves, ST. 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; 41(8):1636 Epub Mar 6 2014.