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Item 2626

REGULATION

OF THE MINISTER OF HEALTH[1]

of 06 December 2022

on diagnostic reference levels [2]

Pursuant to Article 33g(3) of the Act of 29 November 2000 on the Atomic Law (Dz. U. of 2021, item 1941, and of 2022, item 974), it is ordered as follows:

§ 1. This Regulation defines diagnostic reference levels for X-ray diagnostic examinations, diagnostic nuclear medicine examinations, and interventional radiology examinations.

§ 2. 1. Diagnostic reference levels for X-ray diagnostic and interventional radiology examinations are specified in Annex No. 1 to this Regulation.

2. Diagnostic reference levels of activity of radiopharmaceutical products for diagnostic nuclear medicine examinations are defined in Annex No. 2 to this Regulation.

§ 3. This Regulation shall enter into force 14 days following its promulgation.[3]

Minister of Health: A. Niedzielski

[1] The Minister of Health heads the department of government administration – health, pursuant to § 1(2) of the Regulation of the Prime Minister of 27 August 2020 on the detailed scope of activities of the Minister of Health (Dz. U. of 2021, item 932).

[2] This Regulation implements within its scope the Council Directive 2013/59/Euratom of 5 December 2013 laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation, and repealing Directives 89/618/Euratom, 90/641/Euratom, 96/29/Euratom, 97/43/Euratom and 2003/122/Euratom (OJ EU L 13, 17.1.2014, p. 1, OJ EU L 72, 17.3.2016, p. 69, OJ EU L 152, 11.6.2019, p. 128 and OJ EU L 324, 13.12.2019, p. 80).

[3] 3) This regulation was preceded by the Regulation of the Minister of Health of 18 February 2011 on the conditions for the safe use of ionizing radiation for all types of medical exposure (Dz. U. of 2017, item 884), which expired on 24 September 2022 in accordance with Article 37(2)(1) of the Act of 13 June 2019 amending the Atomic Law and the Fire Protection Act (Dz. U., item 1593, and of 2020, item 284).

Annexes to the Regulation of the Minister of Health
of 6 December 2022 (Dz. U., item 2626)

Annex No. 1

DIAGNOSTIC REFERENCE LEVELS FOR DIAGNOSTIC X-RAY AND INTERVENTIONAL RADIOLOGY EXAMINATIONS

Table 1. Diagnostic reference levels in radiography and mammography for a standard adult patient of height 170 cm and weight 70 kg (use either DAP or K_w to determine compliance with the reference level)

No.	Type of examination	DAP(1) [cGy × cm^2]	K_w(2) [mGy]
1	Skull AP/PA	60	3.7
2	Skull LAT	50	2.3
3	Chest PA	15	0.21
4	Chest LAT	50	1.1
5	Thoracic spine AP	110	5.2
6	Thoracic spine LAT	160	9.0
7	Lumbar spine AP	200	7.4
8	Lumbar spine LAT	400	22
9	Pelvis AP	250	7.0
10	Abdominal cavity	270	7.0
11	Teeth - intraoral radiograph(3)	–	1.5
12	Pantomography	15	–
13	Mammography(4) CC and MLO	–	2.5

(1) The product of the air kerma and the area determined by the x-ray beam in the plane perpendicular to the beam axis (DAP).

(2) Input dose (K_W) - air kerma in air at the point where the beam axis intersects with the patient's body surface.

(3) Air kerma for a photo of a maxillary molar measured at the end of the x-ray tube.

Mean glandular dose value for a 5.3 cm thick compressed standard breast or a 4.5 cm thick PMMA phantom (according to Quality assurance programme for digital mammography. Vienna: International Atomic Energy Agency, 2011.
IAEA human health series, ISSN 2075-3772; no. 17; STI/PUB/1482; ISBN 978-92-0-111410-5).

Table 2. Diagnostic reference levels in pediatric radiography

No.	Type of examination	Age	DAP[(1)] [cGy × cm^2]
1	Chest PA	premature baby (about 1000 g)	0.3
		newborn (approx. 3000 g)	0.8
		10 ± 2 months	2
		5 ± 2 years	3
		10 ± 2 years	4
2	Chest LAT	5 ± 2 years	7
		10 ± 2 years	8
3	Abdominal cavity AP/PA	10 ± 2 months	25
		5 ± 2 years	50
		10 ± 2 years	60
4	Pelvis AP	5 ± 2 years	25
		10 ± 2 years	30
5	Skull AP	10 ± 2 months	30
		10 ± 2 years	40
6	Skull LAT	10 ± 2 months	30
		10 ± 2 years	30
7	Retrograde cystourethrography	newborn (approx. 3000 g)	60
		10 ± 2 months	90
		5 ± 2 years	120
		10 ± 2 years	240

(1) The product of the air kerma and the area determined by the x-ray beam in the plane perpendicular to the beam axis (DAP).

Table 3. Diagnostic CT reference levels for a standard adult patient of height 170 cm and weight 70 kg (use either CTDIw or DLP to determine compliance with the reference level)

No.	Type of examination	$CTDI_w$[1] [mGy]	DLP[2] [mGy cm]
1	Routine head or brain examination[3]	60	1050
2	Examination of the face and sinuses[3]	35	360
3	Routine examinations of the chest[4]	30	650
4	CT scan, chest, high resolution[4]	35	280
5	Routine examination of the abdomen or abdominal cavity[4]	35	780
6	Examination of the liver and spleen[4]	35	900
7	Routine examination of the pelvis or pelvic organs[4]	35	570
8	Examination of the pelvic bones or pelvic rim[4]	25	520
9	CT scan, cervical spine[4]	27	600
10	CT scan, thoracic spine[4]	21	750
11	CT scan, lumbosacral spine[4]	15	820
12	CT scan, neck, soft tissues[4]	18	500
13	Angio-CT (CT Angiography), carotid arteries[4]	21	600
14	Angio-CT, heart and thoracic vessels[4]	19	700
15	Angio-CT, thoracic aorta[4]	40	800
16	Angio-CT, abdominal cavity and minor pelvis[4]	21	1050
17	Angio-CT, head[3]	75	1200

(1) Weighted Computed Tomography Dose Index (CTDIw) for one tube rotation or one layer in spiral technique.

(2) Dose-length product (DLP) for one phase of the examination.

(3) Data refer to a head phantom (PMMA with a diameter of 16 cm).

(4) Data refer to a body phantom (PMMA with a diameter of 32 cm).

Table 4. Diagnostic reference levels for fluoroscopy and procedural radiology for a standard adult patient of 170 cm height and 70 kg weight (use either DAP or T to determine compliance with the reference level)

No.	Type of examination	DAP(1) [Gy × cm^2]	T(2) [min]
1	Small intestine	70	–
2	Dual-contrast examination of the colon	70	–
3	Limb-pelvis phlebography	9	–
4	Limb-pelvis arteriography	85	–
5	Coronarography	60	–
6	PTA - percutaneous transluminal angioplasty of the vessels	100	18
7	PTCA - percutaneous transluminal coronary angioblasty of the heart	120	20

(1) The product of the air kerma and the area determined by the x-ray beam in the plane perpendicular to the beam axis (DAP).

T - time of exposure

Annex No. 2

DIAGNOSTIC REFERENCE LEVELS OF ACTIVITY OF RADIOPHARMACEUTICAL PRODUCTS FOR DIAGNOSTIC NUCLEAR MEDICINE EXAMINATIONS

Table 1. Diagnostic reference levels in nuclear medicine. Examinations for a standard adult patient of 170 cm height and 70 kg weight

Type of examination	Radionuclide and radiopharmaceutical product	Activity per examination [MBq]
1	2	3
Bone structure - imaging	^{99m}Tc – phosphates, phosphonates	750
Bone marrow - imaging	^{99m}Tc – colloids	400
Brain perfusion	[^{99m}Tc]Tc-HMPAO [^{99m}Tc]Tc-ECD	750 750
Cisternography	[^{111}In]In-DTPA	40
Thyroid imaging	$^{99m}TcO_4$ ^{123}I – iodides ^{131}I – iodides	80 20 4
Searching for metastases of thyroid cancer after ablation of the gland	^{13l}I – iodides	240
Imaging of the parathyroid glands and adenomas of this organ	[^{99m}Tc]Tc-MIBI	750
Imaging of lung ventilation	[^{99m}Tc]Tc-DTPA – aerosol Technegas	200 30
Planar lung perfusion imaging	^{99m}Tc – microspheres	100
Tomographic imaging of lung perfusion	^{99m}Tc – microspheres	400
Imaging of the liver and spleen	^{99m}Tc – labelled colloids	200
Dynamic imaging of the biliary system	^{99m}Tc – iminodiacetate derivatives	200
Imaging of the spleen using denatured erythrocytes	^{99m}Tc – denatured erythrocytes	100
Examination of the first passage of blood through the pulmonary circulation and heart	$^{99m}TcO_4$ – solution [^{99m}Tc]Tc-DTPA	400 800
Imaging of the left ventricular blood pool and its dynamics (gating)	^{99m}Tc – erythrocytes (labelled in vivo)	800
Imaging and perfusion of the left ventricular myocardium	^{99m}Tc – phosphonates, isonitriles and equivalents	800

Imaging of Meckel's diverticulum	$^{99m}TcO_4$ – solution	400
Gastrointestinal bleeding - localization	^{99m}Tc – erythrocytes and equivalent	400
Study of food passage through the esophagus, study of gastroesophageal reflux	^{99m}Tc – colloids and non-absorbable compounds	40
Study of gastric emptying	^{99m}Tc – non-absorbable compounds	40
Static imaging of the kidneys	[^{99m}Tc]Tc-DMSA	200
Dynamic imaging of the urinary tract	[^{99m}Tc]Tc-DTPA [^{99m}Tc]Tc-EC, [^{99m}Tc]Tc-MAG-3	200 100 100
Imaging of the adrenal glands	^{131}I – iodomethyl-norcholesterol	40
Imaging of selected tumors and abscesses	^{67}Ga – citrate	400
Imaging of selected cancers	^{99m}Tc – somatostatin analogues	800
Imaging of neuroectodermal tumors	^{123}I – metaiodobenzylguanidine ^{131}I – metaiodobenzylguanidine	400 40
Imaging of the extent of the neoplastic process of selected tumors	[^{99m}Tc]Tc-MIBI	1000
Imaging of sentinel lymph nodes	^{99m}Tc – colloids	80
Imaging of abscesses and inflammatory foci	^{99m}Tc – labelled leukocytes ^{99m}Tc – immunoglobulin	800 400
Determination of renal glomerular clearance	[^{99m}Tc]Tc-DTPA	40
Determination of effective plasma flow through the kidneys Plasma clearance rate by tubular secretion	[^{99m}Tc]Tc-EC [^{99m}Tc]Tc-MAG3	40 40
Hepatic clearance of ^{99m}Tc-HEPIDA	[^{99m}Tc]Tc-HEPIDA	40

Table 2. The value of the factor for calculating the activity of radiopharmaceuticals administered to children in relation to the activity of radiopharmaceuticals used for a standard adult patient of height 170 cm and weight 70 kg, depending on body weight

No.	Body weight [kg].	Value of the factor
1	3	0.10
2	4	0.14
3	6	0.19
4	8	0.23
5	10	0.27
6	12	0.32
7	14	0.36
8	16	0.40
9	18	0.44
10	20	0.46
11	22	0.50
12	24	0.53
13	26	0.56
14	28	0.58
15	30	0.62
16	32	0.65
17	34	0.68
18	36	0.71
19	38	0.73
20	40	0.76
21	42	0.78
22	44	0.80
23	46	0.83
24	48	0.85
25	50	0.88
26	52–54	0.90
27	56–58	0.92
28	60–62	0.96
29	64–66	0.98
30	68	0.99
31	>70	1.00