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Актуализация формы федерального государственного статистического наблюдения № 3-ДОЗ «Сведения о дозах облучения пациентов при проведении медицинских рентгенорадиологических исследований»: часть 2 (рекомендации по заполнению формы)

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АННОТАЦИЯ

Приказом Росстата № 880 от 30 ноября 2022 года утверждена новая редакция формы федерального статистического наблюдения № 3-ДОЗ «Сведения о дозах облучения пациентов при проведении медицинских рентгенорадиологических исследований», которая существенно отличается от предыдущей редакции. В частности, скорректирована и изменена структура таблиц формы № 3-ДОЗ с выделением в отдельные графоклетки высокодозовых исследований; переработан раздел по радионуклидной диагностике с переходом на предоставление информации по уровням облучения пациентов при использовании отдельных радионуклидов с выделением гибридных исследований; внедрены отдельные таблицы с информацией о числе рентгенорадиологических исследований и коллективных дозах для детских пациентов; сокращено количество исследований, для которых представлены типичные (средние) эффективные дозы пациентов.

В рамках настоящей работы представлена структура актуализированной формы № 3-ДОЗ, а также даны рекомендации по её заполнению, направленные на повышение достоверности предоставляемых данных и снижение количества процедурных ошибок.

Данная работа является продолжением статьи Водоватова А.В., Чипиги Л.А., Братиловой А.А., Дружининой П.С., Шацкого И.Г., Петряковой А.В., Сарычевой С.С., Библина А.М., Ахматдинова Р.Р., Капыриной Ю.В., Солдатова И.В., Пузырева В.Г., Рыжова С.А. «Актуализация формы федерального государственного статистического наблюдения № 3-ДОЗ «Сведения о дозах облучения пациентов при проведении медицинских рентгенорадиологических исследований». Предпосылки к переработке», опубликованной в журнале «Радиационная гигиена» (2023. Т. 16, № 2. С. 126–136. DOI: https://doi.org/10.21514/1998-426X-2023-16-2-126-136).

Ключевые слова: единая система контроля и учёта индивидуальных доз облучения граждан; ЕСКИД; дозы облучения; форма № 3-ДОЗ; пациенты; медицинское облучение.

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Update of the federal governmental statistical surveillance form № 3-DOZ: "Data on patient doses from medical X-ray examinations"— Part 2 (FORM completion Recommendations)

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ABSTRACT

The form of federal governmental statistical surveillance № 3-DOZ, titled "Data on patient doses from medical X-ray examinations," has changed significantly by the order of Rosstat N 880. In particular, the structure of the form's has been revised: studies involving high doses were dedicated from the rest; the section on radionuclide diagnostics has been redesigned; the information on the levels of patient exposure when using individual radionuclides and in hybrid studies have been displayed; information on the number of radiological studies and collective doses for pediatric patients have been introduced; and the number of studies for which typical (average) effective doses of patients are presented has been reduced. The structure of the updated form № 3-DOZ is presented within the framework of this work.

In this article, recommendations for filling out № 3-DOZ have been developed in order to increase the reliability of the data provided and reduce the number of procedural errors.

This work is a continuation of the article Vodovatov A.V., Chipiga L.A., Bratilova A.A., Druzhinina P.S., Shatskiy I.G., Petryakova A.V., Sarycheva S.S., Biblin A.M., Akhmatdinov R.R., Kapyrina Yu.N., Soldatov I.V., Puzyrev V.G., and Ryzhov S.A. "Update of the federal governmental statistical surveillance form № 3-DOZ "Data on patient doses from medical X-ray examinations". Perquisites for the update, published in the journal Radiatsionnaya Gygiena (2023. Vol. 16, N 2. P. 126–136. DOI: https://doi.org/10.21514/1998-426X-2023-16-2-126-136).

Keywords: unified system of individual dose control of the Russian federation citizens; effective dose; form № 3-DOZ; patients; medical exposure.

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更新第3-DOZ号联邦国家统计观察表《医疗X射线放射检查期间患者所受辐射剂量的信息》：第2部分（填表建议）

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简评

俄罗斯国家统计局2022年11月30日第880号命令批准了新版第3-DOZ号联邦统计观察表《医疗X射线放射检查期间患者所受辐射剂量的信息》，该表与旧版有很大不同。特别是对第3-DOZ号表中的表格结构进行了调整和更改，将高剂量检查分配到单独的栏目中；重新设计了放射性核素诊断部分，过渡到提供使用单个放射性核素时患者受照射水平的信息以及混合检查的分配；引入了单独的表格，其中包含儿科患者的X射线放射检查数量和集体剂量信息；减少了提供患者典型（平均）有效剂量的检查数量。

本文介绍更新后的第3-DOZ号表的结构，并对其填写提出了建议，旨在提高所提供数据的可靠性并减少程序性错误的数量。

本文是Vodovatov A.V.、Chipiga L.A.、Bratilova A.A.、Druzhinina P.S.、Shatsky I.G.、Petryakova A.V.、Sarycheva S.S.、Biblin A.M.、Akhmatdinov R.R.、Kapyrina Y.V.、Soldatov I.V.、Puzyrev V.G.和Ryzhov S.A.、Ryzhov S.A.《更新第3-DOZ号联邦国家统计观察表《医疗X射线放射检查期间患者辐射剂量的信息》。修订的前提条件》文章的续篇，发表于《辐射卫生》杂志（2023。Vol.16，№2。P.126-136。DOI：https://doi.org/10.21514/1998-426X-2023-16-2-126-136）。

关键词：公民个人辐射剂量统一控制和核算系统；USMID；辐射剂量；第3-DOZ号表；患者；医疗照射。

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INTRODUCTION

The Form No. 3-DOZ (hereinafter "the Form") is designed to assess changes in diagnostic radiology structure and collective doses caused by medical exposure of the Russian Federation population [1–3]. Data obtained using this Form are used for radiation-hygienic certification of the Russian Federation territories and for preparing a state report on the population's sanitary and epidemiological condition [4, 5]. The 3-DOZ study results are used in the annual report "Radiation Doses Received by the Population of the Russian Federation" [6].

Order No. 880 of Federal State Statistics Service (Rosstat),[1] dated November 30, 2022, approved a new version of Federal Statistical Monitoring Form No. 3-DOZ, "Data on Radiation Doses Received by Patients from Medical Radiological Examinations," which differs significantly from the standard version approved sequentially by Rosstat Resolution No. 51 dated September 21, 2006[2], and Rosstat Order No. 411 dated October 16, 2013[3]. Since 2006, no changes have been made, except for the correction of Form completion instructions and the content of the title page. The following significant changes were made to the revised version of Form No. 3-DOZ:

- the structure of the Form tables has been updated and changed, with special space added for high-dose examinations, such as computed tomography (CT) with contrast media; CT scan of several anatomical areas (chest + abdomen, abdomen + pelvis, and whole body), and interventional radiology;
- the section on radionuclide diagnostics has been revised to include information on patient exposure levels when using individual radionuclides, as well as hybrid examinations, such as positron emission tomography combined with computed tomography (PET/CT) and single photon emission computed tomography combined with computed tomography (SPECT/CT);
- the classification of CT and interventional (special) examinations has been aligned with Form No. 30 of the Ministry of Healthcare of the Russian Federation;
- separate tables have been prepared for information on the number of radiological examinations and collective doses for pediatric patients; and
- the number of examinations, including data on typical (average) effective patient doses, has reduced.

The reasons for implementing these provisions were detailed in a previous authors' paper [7].

Many changes may be associated with various challenges when completing the updated Form. Therefore, the authors aimed to prepare recommendations and clarifications for the updated Form's complete instructions.

During the first years after the implementation of the updated Form, specialists responsible for completing it may encounter some difficulties. Therefore, this paper provides recommendations for completing the Form. Moreover, some regions, in collaboration with the Saint Petersburg Research Institute of Radiation Hygiene, named after Professor P.V. Ramzaev of the Federal Service for the Oversight of Consumer Protection and Welfare (hereinafter referred to as the Institute of Radiation Hygiene), published training materials and automated the process of submitting reports through web resources [8, 9].

It is appropriate to describe the structure of the updated Form in detail, highlight the key features of completing it, and provide recommendations to reduce completion errors associated with the transition to the new Form.

STRUCTURE OF UPDATED FORM NO. 3-DOZ AND RECOMMENDATIONS FOR ITS COMPLETION AIMED AT INCREASING THE RELIABILITY OF DATA PROVIDED AND REDUCING THE NUMBER OF PROCEDURE ERRORS

General provisions

The first key difference between the updated Form and the old one is the change in the title page in accordance with current legislation.[4] In the previous version, the executive authorities of the Russian Federation's constituent entities were identified as subjects of official statistical accounting, such as the Main Directorate of Special Programs of the President of the Russian Federation, Presidential Administration of Russia, Federal Budgetary Institution of Healthcare "Center for Hygiene and Epidemiology," Federal

[1] Order of Rosstat No. 880 dated November 30, 2022 on approval of the federal statistical monitoring form with the Form completion instructions for the Federal Service for the Oversight of Consumer Protection and Welfare to organize federal statistical monitoring of the sanitary condition of a constituent entity of the Russian Federation. Link: https://normativ.kontur.ru/document?moduleId=1&documentId=437635.

[2] Resolution of Rosstat No. 51 dated September 21, 2006 on approval of statistical tools for Rospotrebnadzor to organize statistical monitoring of population incidence of infectious and parasitic diseases, preventive vaccinations, sanitary condition of territories, summer health institutions for children and adolescents, disinfection activities, and radiation doses. Link: https://normativ.kontur.ru/document?moduleId=1&documentId=223414.

[3] Order of Rosstat No. 411 dated October 16, 2013 on approval of statistical tools for the Federal Service for the Oversight of Consumer Protection and Welfare to organize federal statistical monitoring of the sanitary condition of territories, occupational diseases (poisonings), and radiation doses. Link: https://normativ.kontur.ru/document?moduleId=1&documentId=443740.

[4] Order of Rosstat No. 880 dated November 30, 2022 on approval of the federal statistical monitoring form with the Form completion instructions for the Federal Service for the Oversight of Consumer Protection and Welfare to organize federal statistical monitoring of the sanitary condition of a constituent entity of the Russian Federation. Link: https://normativ.kontur.ru/document?moduleId=1&documentId=437635.

Budgetary Institution "Research Institute of Radiation Hygiene named after Professor P.V. Ramzaev." According to Part 1 of Article 5 of Federal Law No. 282-FZ of November 29, 2007[5] (hereinafter referred to as the Law on Statistical Accounting), official statistical accounting in the Russian Federation is carried out by subjects of official statistical accounting. Article 2 of the Law on Statistical Accounting, paragraph 4, contains a comprehensive list of official statistical accounting topics that exclude the bodies and organizations indicated above. Only respondents and subjects of official statistical accounting may be shown in the Form, and the same bodies cannot be deemed independent subjects of official statistical accounting and Form respondents simultaneously. A compromise approach was established when developing the latest version of the Form: only respondents (legal entities and individual entrepreneurs using sources of ionizing radiation for medical purposes) and subjects (Rospotrebnadzor) of statistical registration are left on the title page.

Simultaneously, the entire procedure for completing and submitting the Form remained unchanged. A healthcare organization submits forms for the reporting year by April 1 to an executive healthcare authority of a constituent entity of the Russian Federation, including institutions and structural divisions of federal executive authorities listed in paragraph 4 of Regulations on the implementation of federal state sanitary and epidemiological supervision in the Russian Federation, approved by Decree No. 476 of the Government of the Russian Federation dated June 15, 2013 (as applicable).[6] Before May 1, the executive healthcare authorities of a constituent entity of the Russian Federation provided data to the Federal Budgetary Institution "Center for Hygiene and Epidemiology" in that constituent entity. Before May 15, the Center for Hygiene and Epidemiology in the constituent entity of the Russian Federation provided data to the Office of Rospotrebnadzor of the constituent entity of the Russian Federation. Rospotrebnadzor departments of the constituent entities of the Russian Federation provide data to the Research Institute of Radiation Hygiene.

Summary reporting data from the Research Institute of Radiation Hygiene, Federal Medical-Biological Agency, structural divisions of the Ministry of Defense of the Russian Federation, the Ministry of Internal Affairs of the Russian Federation, the Federal Security Service of the Russian Federation, the Federal Service of the Troops of the National Guard of the Russian Federation, the Federal Security Service of the Russian Federation, the Federal Penitentiary Service, the Main Directorate of Special Programs of the President of the Russian Federation and the Presidential Administration of Russia, respectively, in the Armed Forces of the Russian Federation, other troops, military formations and organizations, at defense and defense manufacturing facilities, security, internal affairs, and other special services in accordance with Decree No. 476 of the Government of the Russian Federation dated June 5, 2013[7] (according to affiliation) should also be provided to Rospotrebnadzor before May 15.

The updated Form is divided into three sections (10 tables): the first and second sections are radiological examinations, and the third is radionuclide examinations. The first section (Tables 1100, 1200, 1300, and 1400) presents procedure data without monitoring or considering patient radiation doses.[8] The lack of dosage control and recording violates Article 18 of the Federal Law on Population Radiation Protection[9] and SanPiN 2.6.1.1192-03[10]. As an exception, temporary completion of Section 1 tables of the Form is allowed. All healthcare institutions should monitor and record individual patient radiation doses when conducting radiological examinations.

The second section (Tables 2100, 2200, 2300, and 2400) contains information on procedures with estimated patient doses based on measured parameters. The first two sections consist of four tables that detail the total patient radiation doses and the number of radiological procedures performed on children (0–17 yr) and adults (over 18 yr). All data are presented in absolute terms.

Tables 1100, 1300, 2100, and 2300 present information on doses received by patients during radiological examinations for diagnostics and treatment purposes. Tables 1100 (adults) and 1300 (children) should include collective doses based on statistical data on the number of various radiological procedures performed during the reporting year and average individual doses for each type of procedure (for procedures

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[5] Federal Law No. 282-FZ dated November 29, 2007 on official statistical accounting and the system of state statistics in the Russian Federation. Link: https://www.consultant.ru/document/cons_doc_LAW_72844/.

[6] Decree No. 476 of the Government of the Russian Federation dated June 05, 2013 on issues of state control (supervision) and invalidation of certain acts of the Government of the Russian Federation (with amendments and additions). Link: https://base.garant.ru/70394016/.

[7] Decree No. 476 of the Government of the Russian Federation dated June 05, 2013, on issues of state control (supervision) and invalidation of certain acts of the Russian Federation (with amendments and additions). Link: https://www.consultant.ru/document/cons_doc_LAW_147378/.

[8] Guidelines Completing federal state statistical monitoring form No. 3-DOZ. Project. Link: http://niirg.ru/PDF/MR_3-DOS_2013.pdf.

[9] Federal Law No. 3-FZ dated January 09, 1996 (as amended on March 18, 2023) "On Radiation Protection of the Population." Article 18. Control and recording of individual radiation doses. Access mode: https://www.consultant.ru/document/cons_doc_LAW_8797/2d546164990e9137dc5b194a17843d8762e08451.

[10] Resolution of the Chief State Sanitary Doctor of the Russian Federation dated 02/18/2003 No. 8 "On the implementation of SanPiN 2.6.1.1192-03" (together with "SanPiN 2.6.1.1192-03. 2.6.1. Ionizing radiation, radiation safety. Hygienic requirements for the device and operation of X-ray rooms, devices and conducting X-ray examinations. Sanitary rules and regulations"). Access mode: https://www.consultant.ru/document/cons_doc_LAW_41439/.

with no control and accounting for patient radiation doses). Tables 1100, 1300, 2100, and 2300 should not include duplicate data.

When performing radiological procedures (procedures with patient radiation doses monitored and recorded), Tables 2100 (adults) and 2300 (children) should present collective doses based on standard patient radiation doses.[11]

Columns 3–12 of Tables 1100, 1300, 2100, and 2300 present data based on various types of diagnostic radiological and therapeutic procedures specified in the column headers.

The structural differences between the previous and updated versions of Form No. 3-DOZ are presented in Table 1.

Recommendations for completing tables in Form No. 3-DOZ

Healthcare organizations must provide a completed Form for all medical diagnostic radiation sources, including endovascular and interventional procedures. Data on radiation, radionuclide therapy, and radionuclide diagnostics *in vitro* are not included in Form No. 3-DOZ. Form No. 3-DOZ is completed in radiation therapy departments for all diagnostic examinations to prepare the patient for a course of radiation therapy (dosimetry planning). Magnetic resonance imaging and ultrasound examinations are also not listed in the Form because they do not expose the patient to ionizing radiation.

The Form considers the number of radiological procedures and examinations performed. A radiological procedure is defined as a single patient exposure while examining a specific anatomical area (one image); a radiological examination is a complete cycle of examination of a patient's certain organ (anatomical area), which may include several procedures using different projections and/or different types (Figure 1). Form No. 3-DOZ is completed only for the number

Table 1. Structural changes in the updated Form No. 3-DOZ

Section	Previous version	Updated version	Method of effective dose determination
Radiological examinations, dose estimation method	Collective dose — 1000 Number of procedures — 1100	Collective dose, adults — 1000 Number of procedures, adults — 1100	Average effective doses based on reference literature [10, 11]
		Collective dose, children — 1300 Number of procedures, children — 1400	
Radiological examinations, dose control	Collective dose — 2000 Number of procedures — 2100	Collective dose, adults — 2100 Number of procedures, adults — 2200	Standard effective doses based on current regulatory and methodological documents[12]
		Collective dose, children — 2300 Number of procedures, children — 2400	
The number of radionuclide examinations performed and the resulting effective patient radiation doses	3000	Adults—3100	Standard effective based on current regulatory and methodological documents[13]
		Children—3200	

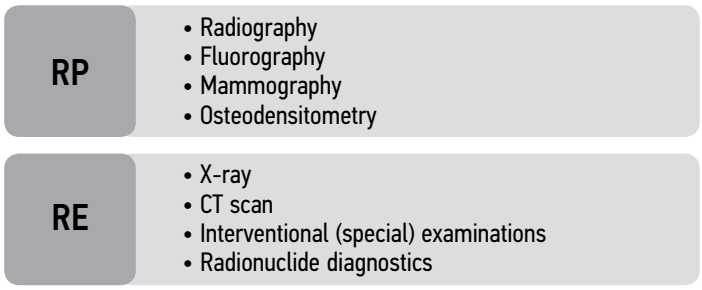

Fig. 1. Classification of radiological diagnostic methods using ionizing radiation. RE, radiological examination; RP, radiological procedure.

[11] Guidelines MUK 2.6.1.1797-03 Control of effective radiation doses for patients when conducting medical radiological examinations" (https://docs.cntd.ru/document/1200035983); Guidelines MU 2.6.1.3151-13 Evaluation and accounting of effective doses for patients when conducting radionuclide diagnostic examinations (https://base.garant.ru/70747326/).

[12] Guidelines 2.6.1.3584-19. 2.6.1. Ionizing radiation, radiation protection. Changes in MU 2.6.1.2944-11 Control of effective radiation doses for patients when conducting medical radiological examinations (https://www.consultant.ru/document/cons_doc_LAW_368034/); Guidelines MR 2.6.1.0296-22 Optimization of radiation protection of patients in diagnostic radiology by using reference diagnostic levels (https://base.garant.ru/405781973/).

[13] Guidelines MU 2.6.1.3151-13 Evaluation and accounting of effective doses for patients when conducting radionuclide diagnostic examinations (https://base.garant.ru/70747326/); Guidelines MR 2.6.1.0296-22 Optimization of radiation protection for patients in diagnostic radiology by using reference diagnostic levels (https://base.garant.ru/405781973/).

of examinations for all combined examinations (fluoroscopic, interventional, radionuclide examinations combined with CT); individual structural elements of radiological examinations (e.g., CT in SPECT/CT or PET/CT; X-rays as part of fluoroscopy or interventional examinations) are not highlighted (see Figure 1).

The total number of radiological examinations may be smaller than the total number of radiological procedures for a particular organ or anatomical area.

It is recommended to use the Federal Directory Diagnostic Investigations classification when assigning radiological examinations/procedures of a particular anatomical area [12].

Radiography

The column "Radiography" (columns 3 and 4) should include information about effective doses obtained by patients during radiographic examinations (two-dimensional projection X-ray images), fluorographic examinations of the chest, and screening examinations of mammary glands.

Information on radiological examinations performed using analog and digital X-ray machines should be presented in columns 3 and 4, respectively.

The absence of a special segment for fluorographic examinations (screening chest radiography) is worth noting. Data on fluorographic examinations performed using photography and X-ray film are presented in column 3 (film radiographs), line 2 (including preventive procedures). Data on fluorographic examinations performed using digital X-ray machines (U-arc type and scanning fluorographs) are presented in column 4 (digital radiographs), line 2 (including preventive procedures). All examinations performed using fluorography machines are shown in lines for the corresponding anatomical areas and columns 3 and 4 for analog and digital devices, respectively.

Data on mammary gland screening examinations performed on analog and digital machines are presented in column 3, line 22, and column 4, line 22, respectively.

General information about table changes in Form No. 3-DOZ for radiographic examinations is presented in Table 2.

Table 2. Structural changes in radiography information in the updated Form No. 3-DOZ

Field of interest in the previous Form	Line of the previous Form	Field of interest in the updated Form	Line of the updated Form	Comment
Chest	Line 01 (2000)	Chest	Adults — Line 01 (2100) Children — Line 01 (2300)	Including both preventive and diagnostic examinations
Chest, including preventive procedures	Line 02 (2000)	Chest, including preventive procedures	Adults — Line 02 (2100) Children — Line 02 (2300)	In the new Form, all fluorographic (screening) chest examinations (film and digital) are presented in this line.
Extremities	Line 03 (2000)	Upper extremities	Adults — Line 07 (2100) Children — Line 07 (2300)	—
		Lower extremities	Adults — Line 08 (2100) Children — Line 08 (2300)	
Cervical vertebrae	Line 04 (2000)	Cervical spine	Adults — Line 09 (2100) Children — Line 09 (2300)	—
Thoracic vertebrae	Line 05 (2000)	Thoracic spine	Adults — Line 10 (2100) Children — Line 10 (2300)	—
Lumbar vertebrae	Line 06 (2000)	Lumbar spine	Adults — Line 11 (2100) Children — Line 11 (2300)	—

Table 2. Ending

Field of interest in the previous Form	Line of the previous Form	Field of interest in the updated Form	Line of the updated Form	Comment
Pelvis and thigh	Line 07 (2000)	Pelvic organs	Adults — Line 12 (2100) Children — Line 12 (2300)	—
		Hip joint	Adults — Line 13 (2100) Children — Line 13 (2300)	
Ribs and sternum	Line 08 (2000)	Ribs and sternum	Adults — Line 14 (2100) Children — Line 14 (2300)	—
Abdominal organs	Line 09 (2000)	Abdomen	Adults — Line 15 (2100) Children — Line 15 (2300)	—
Upper gastrointestinal tract	Line 10 (2000)	Upper gastrointestinal tract	Not to be completed	Not to be filled out
Lower gastrointestinal tract	Line 11 (2000)	Lower gastrointestinal tract	Not to be completed	Not to be filled out
Skull, maxillofacial region	Line 12 (2000)	Skull, brain, maxillofacial region	Adults — Line 18 (2100) Children — Line 18 (2300)	—
Teeth	Line 13 (2000)	Teeth	Adults — Line 19 (2100) Children — Line 19 (2300)	Targeted images — Line 19, column 03/04 Orthopantomograms — Line 19, column 04
Kidneys, urinary system	Line 14 (2000)	Kidneys, urinary system	Adults — Line 20 (2100) Children — Line 20 (2300)	Including irrigoscopy
Breast	Line 15 (2000)	Breast	Adults — Line 21 (2100) Children — Line 21 (2300)	—
including preventive procedures	Line 16 (2000)	including preventive procedures (line 21)	Adults — Line 22 (2100) Children — Line 22 (2300)	—
Others	Line 17 (2000)	Others	Adults — Line 26 (2100) Children — Line 26 (2300)	—
Total	Line 18 (2000)	Total	Adults — Line 27 (2100) Children — Line 27 (2300)	—

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Fluoroscopy

Fluoroscopy includes examinations that involve the administration of a contrast agent orally, rectally, or through a urological catheter. Examples of completing the "Fluoroscopy" column in updated Form No. 3-DOZ are presented in Table 3.

Computed tomography

The updated Form adds a section for contrast-enhanced and unenhanced CT scans. Data on contrast-enhanced and unenhanced CT examinations of pediatric and adult patients should be presented in columns 7 and 6, respectively.

The updated Form provides detailed information about CT examinations of the circulatory system, including the heart, coronary vessels, and thoracic and abdominal aorta.

Please remember that individual CT scans will not be counted. A single CT scan may consist of one or more scans of the same anatomical area. For example, one CT examination of the liver or kidneys and urinary tract using intravenous contrast may consist of one to five scans yet is counted as one examination. The total dose for all phases should be considered for multiphase CT scans with contrast administration.

Information on lung cancer screening using low-dose CT and breast tomosynthesis is presented in lines 2 of column 6 and 22 of column 6, respectively.

The updated Form has separate lines for examining two or more anatomical regions or an anatomical region and a particular organ. Information on such examinations is presented in lines 23–25. Information on whole body CT examinations is shown in line 25, "Other."

General information on changes in CT examination tables of Form No. 3-DOZ is presented in Table 4.

Interventional examinations

In the updated Form of 3-DOZ, the section on interventional (special) examinations has been significantly revised. In accordance with Form No. 30, "Information about a healthcare organization" of the Ministry of Health

Table 3. Examples of filling out the "X-ray" column in the updated Form No. 3-DOZ

Fluoroscopy	Localization	Line of the updated Form	Type of effective dose determination procedure[14]
Chest X-ray	Rib cage	Line 01 — Chest organs	Lungs
X-ray of the thoracic region and the spinal cerebrospinal fluid pathways with contrast	Thoracic spine, cerebrospinal fluid tracts of the spinal cord	Line 10 — Thoracic spine	Thoracic spine
X-ray of the stomach and duodenum with contrast X-ray of the stomach and duodenum with double contrast	Stomach, duodenum	Line 15 — Abdominal organs	Stomach
X-ray of the pharynx and esophagus with contrast X-ray of the esophagus with contrast	Pharynx, esophagus	Line 16 — Upper gastrointestinal tract	Esophagus
X-ray of the passage of contrast material through the intestine	Gastrointestinal tract	Line 17 — Lower gastrointestinal tract	Intestines
X-ray of the small intestine through an ileostomy	Small intestine	Line 17 — Lower gastrointestinal tract	Intestines
X-ray of the colon with contrast X-ray of the colon with double contrast	Colon	Line 17 — Lower gastrointestinal tract	Intestines
X-ray of the rectum with functional tests X-ray of the rectum during defecation	Rectum	Line 17 — Lower gastrointestinal tract	Intestines
X-ray of paranasal sinus fistula	Paranasal sinuses	Line 18 — Skull, brain, maxillofacial area	Scull

[14] Guidelines MU 2.6.1.3584-19 Changes to MU 2.6.1.2944-19 Control of effective radiation doses for patients when conducting medical radiological examinations. Link: https://base.garant.ru/73515396/.

Table 4. Computed tomography

Field of interest in the previous Form	Line of the previous Form	Field of interest in the updated Form	Line of the updated Form	Comment
Chest	Line 01 (2000)	Chest organs	Adults — Line 01 (2100) Children — Line 01 (2300)	—
Chest, including preventive procedures	Line 02 (2000)	Chest organs, of which due to preventive procedures	Adults — Line 02 (2100) Children — Line 02 (2300)	Information on lung cancer screening using low-dose computed tomography Information on periodic medical examinations of decreed groups using computed tomography
Absent	Absent	Heart	Adults — Line 03 (2100) Children — Line 03 (2300)	—
Absent	Absent	Heart, of which on the coronary vessels	Adults — Line 0 4 (2100) Children — Line 0 4 (2300)	—
Absent	Absent	Thoracic aorta	Adults — Line 0 5 (2100) Children — Line 0 5 (2300)	—
Absent	Absent	Abdominal aorta	Adults — Line 06 (2100) Children — Line 06 (2300)	—
Limbs	Line 03 (2000)	Upper limbs	Adults — Line 07 (2100) Children — Line 07 (2300)	—
		Lower limbs	Adults — Line 08 (2100) Children — Line 08 (2300)	
Cervical vertebrae	Line 04 (2000)	Cervical spine	Adults — Line 09 (2100) Children — Line 09 (2300)	—
Thoracic vertebrae	Line 05 (2000)	Thoracic spine	Adults — Line 10 (2100) Children — Line 10 (2300)	—
Lumbar vertebrae	Line 06 (2000)	Lumbar spine	Adults — Line 11 (2100) Children — Line 11 (2300)	—
Pelvis and thigh	Line 07 (2000)	Pelvic organs	Adults — Line 12 (2100) Children — Line 12 (2300)	—
		Hip joint	Adults — Line 13 (2100) Children — Line 13 (2300)	
Ribs and sternum	Line 08 (2000)	Ribs and sternum	Adults — Line 14 (2100) Children — Line 14 (2300)	—
Abdomen	Line 09 (2000)	Abdomen	Adults — Line 15 (2100) Children — Line 15 (2300)	—
Upper gastrointestinal tract	Line 10 (2000)	Upper gastrointestinal tract	Adults — Line 16 (2100) Children — Line 16 (2300)	—
Lower gastrointestinal tract	Line 11 (2000)	Lower gastrointestinal tract	Adults — Line 17 (2100) Children — Line 17 (2300)	—
Skull, maxillofacial region	Line 12 (2000)	Skull, brain, maxillofacial region	Adults — Line 18 (2100) Children — Line 18 (2300)	—
Teeth	Line 13 (2000)	Teeth	Adults — Line 19 (2100) Children — Line 19 (2300)	—

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Table 4. Ending

Field of interest in the previous Form	Line of the previous Form	Field of interest in the updated Form	Line of the updated Form	Comment
Kidneys, urinary system	Line 14 (2000)	Kidneys, urinary system	Adults — Line 20 (2100) Children — Line 20 (2300)	—
Breast	Line 15 (2000)	Breast	Adults — Line 21 (2100) Children — Line 21 (2300)	—
Of these, due to preventive procedures	Line 16 (2000)	Including through preventive procedures (from line 21)	Adults — Line 22 (2100) Children — Line 22 (2300)	Column 7, "Contrast-enhanced computer tomography," for this line cannot be completed
Absent	Absent	Thorax + abdomen	Adults — Line 23 (2100) Children — Line 23 (2300)	—
Absent	Absent	Thorax + abdomen + pelvis	Adults — Line 24 (2100) Children — Line 24 (2300)	—
Absent	Absent	Abdomen + pelvis	Adults — Line 24 (2100) Children — Line 24 (2300)	—
Others	Line 17 (2000)	Others	Adults — Line 26 (2100) Children — Line 26 (1300)	Computed tomography of the whole body is performed as part of fluoroscopic diagnostics
Total	Line 18 (2000)	Total	Adults — Line 27 (2100) Children — Line 27 (2300)	-

of the Russian Federation,[15] all interventional examinations are divided into four subgroups: intravascular (angiography and endovascular procedures) and extravascular (surgical procedures guided by medical imaging), diagnostic (imaging only), and therapeutic (X-ray-guided surgery).

Columns 8–11 present all interventional procedures performed using mobile interventional machines in X-ray operating rooms, X-ray rooms, and outside specially equipped rooms (e.g., operating rooms, treatment rooms, and emergency departments).

Criteria for imaging classification are provided in Federal Statistical Monitoring Form No. 30, "Data on a healthcare organization," approved by Rosstat Order No. 985 on December 27, 2022.[16]

Columns 8–11 present information on radiology-guided interventional (extravascular) and endovascular interventions performed for diagnostic (columns 8 and 9) and treatment (columns 10 and 11) purposes. This section also includes information on intravenous contrast examinations.

Intravascular examinations (columns 8 and 10) are radiology-guided examinations of blood vessels using minimally invasive instruments. These include examinations, such as aortography, cavagraphy, phlebography, arteriography, angiocardiography, coronary angiography, lymphography, angioplasty, endovascular techniques, embolization, recanalization, bypass surgery, and vascular dilatation.

Extravascular examinations (columns 9 and 11) include any radiology-guided examinations of internal organs using minimally invasive instruments. These include procedures such as cystography, cholangiodrainage, nephrostomy, lithotripsy, urography, stenting of the kidneys and ureter, hysterosalpingography, arthroscopy, osteosynthesis, vertebroplasty, kyphoplasty, and installation of an intramedullary pin.

Other

Column 12 presents information on examinations not included in columns 3–11.

In line with the anatomical area of interest, information on osteodensitometry is presented in the "Other" column. Lines 23–25 present information on combined examinations

[15] Order of Rosstat No. 863 dated December 30, 2020 (as amended on December 20, 2021) on approval of federal statistical monitoring forms with the Form completion instructions for the Ministry of Health of the Russian Federation to organize federal statistical monitoring in healthcare. Federal statistical monitoring form No. 30 Data on a medical organization. Link: https://www.consultant.ru/document/cons_doc_LAW_373430/d752954a35641c33df844c2e2d910dcb3154d0a2/.

[16] Order of Rosstat No. 985 dated December 27, 2022 on approval of federal statistical monitoring forms with the Form completion instructions for the Ministry of Health of the Russian Federation to organize federal statistical monitoring in healthcare. Link: https://normativ.kontur.ru/document?moduleId=1&documentId=439986.

of two or more anatomical areas. In this case, these types of examinations should be considered only in lines 23–25 without being duplicated in lines 01–22.

Radionuclide diagnostics

Significant changes have been made in Section 3, "Information on radionuclide examinations." The number of examinations has increased significantly from 10 in the previous Form to 20 in the updated one.

Tables 3100 and 3200 should provide data on the number of radionuclide examinations performed during the reporting year and collective doses received by pediatric and adult patients. The number of radionuclide examinations in columns 3–6 of Tables 3100 and 3200 should be interpreted as the number of patients who have received radiopharmaceutical agents. Regardless of the number of consecutive scans (measurements), they are all treated as a single examination.

The following recommendations for completing the Form (listing types of examinations) will help in assigning an examination to the appropriate group:

- The "Skeleton" line includes bone scintigraphy.
- The "Three-phase examination" line includes three-phase examinations of soft tissues and bones.
- The "Liver/spleen" line includes dynamic and static examinations of the liver and spleen.
- The "Thyroid (Tc)" line includes thyroid examinations using ^{99m}Tc-labeled radiopharmaceuticals.
- The "Thyroid gland (I)" line includes thyroid gland examinations using ^{123}I-labeled radiopharmaceuticals.
- The "Parathyroid gland" line contains examinations of the parathyroid gland (if an additional examination of the thyroid gland is performed, it is included in the corresponding line "Thyroid gland," i.e., line 04 or 05).
- The "Neuroendocrine system (I)" line includes examinations with ^{123}I-MIBG.
- The "Brain" line includes brain examinations and brain perfusion examinations.
- The "Lungs" line includes lung perfusion examinations and lung ventilation examinations.
- The "Heart" line includes examinations of the myocardium, including those with functional tests, examinations of the sympathetic nervous system of the myocardium, and radionuclide ventriculography.
- The "Lymphatic system" line includes examinations of the lymphatic system, excluding examination of sentinel nodes.
- The "Lymphatic sentinel nodes" line includes examinations of lymphatic sentinel nodes.
- The "Kidneys (Tc)" line includes renography and dynamic and static examinations of kidneys using ^{99m}Tc-labeled radiopharmaceuticals.
- The "Kidneys (I)" line includes dynamic and static examinations of kidneys using ^{123}I-labeled radiopharmaceuticals.
- The "Whole body" line includes examinations of the whole body to detect inflammatory or oncological lesions, including PET/CT studies.
- The "Examinations using tumorotropic radiopharmaceuticals" line includes examinations with tumorotropic radiopharmaceuticals, excluding PET/CT scans.
- The "Angiography and phlebography" line includes radionuclide angiography and phlebography.
- The "Gastrointestinal tract" line includes stomach, esophagus, and intestines examinations.
- The "Other" line includes examinations not included in lines 01–18.

For hybrid PET/CT and SPECT/CT examinations, the number of examinations should be recorded in column 3, the collective radiopharmaceutical dose should be recorded in column 7, and the CT scanning dose should be recorded in column 8. Patient radiation doses for each examination are assessed by a healthcare organization in accordance with MU 2.6.1.3700-21.[17] The instructions for most radiopharmaceuticals used in the Russian Federation include dose coefficient values based on a patient's age.

RADIATION-HYGIENIC CERTIFICATION

Form 3-DOZ is the information basis for an organization's radiation-hygienic certification. The procedure for transferring data from the Form to the organization's radiation-hygienic passport is provided in Table 5.

CONCLUSION

In 2022, many years of updating Form No. 3-DOS were completed. The updated version of this Form contributes significantly to the information collected on the structure of diagnostic radiology activities and collective doses associated with medical exposure. This Form allows us to collect information about high-dose radiological examinations, such as multiphase CT with intravenous contrast, CT scans of several anatomical areas, hybrid examinations (PET/CT and SPECT/CT), and the entire range of interventional and radionuclide procedures. Because these examinations are associated with high individual patient doses (>20 mSv per procedure), this helps distinguish these examinations from the general nomenclature.

For the first time in Russian (and foreign) practice, obtaining information on radiation doses and the structure of diagnostic procedures for pediatric patients is possible. Requirements

[17] Guidelines MU 2.6.1.3700-21 "Evaluation and accounting of effective doses for patients when conducting radionuclide diagnostic examinations." Link: https://base.garant.ru/403589750/.

Table 5. The procedure for completing the radiation-hygienic passport of an organization based on the data from updated Form 3-DOZ

Types of procedures	Number of procedures for the reporting year, no. per year (sum of values from Tables 1200 + 1400 + 2200 + 2400, except for radionuclide examinations)	Average individual dose, mSv/procedure	Collective dose, person-Sv/year (sum of values from Tables 1100 + 1300 + 2100 + 2300, except for radionuclide research)	Measured doses, %
Fluorographic	Line 02, column 3 + Line 02, column 4	Collective dose/ number of procedures × 1,000	Line 02, column 3 + Line 02, column 4	Sum of values from Tables 2200 + 2400/sum of values from Tables 1200 + 1400 + 2200 + 2400
Radiographic	Line 27, column 3 + Line 27, column 4 — (Line 02, column 3 + Line 02, column 4)	Collective dose/ number of procedures × 1,000	Line 27, column 3 + Line 27, column 4 — (Line 02, column 3 + Line 02, column 4)	Sum of values from Tables 2200 + 2400/sum of values from Tables 1200 + 1400 + 2200 + 2400
Fluoroscopic	Line 27, column 5	Collective dose/ number of procedures × 1,000	Line 27, column 5	Sum of values from Tables 2200 + 2400/sum of values from Tables 1200 + 1400 + 2200 + 2400
CT scan	Line 27, column 6 + Line 27, column 7	Collective dose/ number of procedures × 1,000	Line 27, column 6 + Line 27, column 7	Sum of values from Tables 2200 + 2400/sum of values from Tables 1200 + 1400 + 2200 + 2400
Special examinations	Sum of rows 27, columns 8–11	Collective dose/ number of procedures × 1,000	Sum of rows 27, columns 8–11	Sum of values from Tables 2200 + 2400/sum of values from Tables 1200 + 1400 + 2200 + 2400
Radionuclide examinations	Tables 3100 + 3200 Line 20, column 6	Collective dose/ number of procedures × 1000 or Line 20, column 11	Tables 3100 + 3200 Line 20, column 10	—
Others	Line 27, column 12	Collective dose/ number of procedures × 1,000	Line 27, column 12	Sum of values from Tables 2200 + 2400/sum of values from Tables 1200 + 1400 + 2200 + 2400

for submitting 3-DOZ forms at the organizational and subject levels remained unchanged. The implemented changes will significantly increase the potential of Form No. 3-DOZ to analyze medical exposure levels in the Russian Federation population and make management decisions.

Due to the significant changes, specialists from the Research Institute of Radiation Hygiene are developing new software for completing Form No. 3-DOZ. Detailed instructions for using new software will be presented by the authors in the next paper.

ADDITIONAL INFORMATION

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medicine; A.A. Bratilova performed analysis of the currant state of form № 3-DOZ, edited the draft versions of the manuscript; P.S. Druzhinina developed the changes in the structure of data on computed tomography in form № 3-DOZ, prepared sections of manuscript on computed tomography; I.G. Shatskiy developed the changes in the structure of data on pediatric patients in form № 3-DOZ, prepared sections of manuscript on pediatric exposure; A.V. Petryakova developed the changes in the structure of data on diagnostic nuclear medicine in form № 3-DOZ, prepared sections of manuscript on nuclear medicine; S.S. Sarycheva developed the changes in the structure of data on interventional examinations in form №3-DOZ, prepared sections of manuscript on interventional examinations; A.M. Biblin was responsible for the management of the study, edited draft versions of the manuscript; Rustam R. Akhmatdinov, Ruslan R. Akhmatdinov prepared section on the changes in software; Yu.V. Kapyrina developed the changes in the structure of data on interventional examinations in form №3-DOZ, prepared sections of manuscript on interventional examinations; I.V. Soldatov developed approaches for harmonization of form №3-DOZ with statistical form of the Ministry of Healthcare; Z.A. Lantukh developed approaches for harmonization of form №3-DOZ with statistical form of the Ministry of Healthcare, edited draft version of manuscript; V.G. Puzyrev developed approaches for harmonization of form №3-DOZ with statistical form of the Ministry of Healthcare; S.A. Ryzhov performed literature review, edited draft version of manuscript.

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