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SPECIALIZED MEDICAL CARE FOR VICTIMS OF CHERNOBYL ACCIDENT: SPECIFICS OF ORGANIZATION, TYPES AND VOLUMES, LEADING CLASSES OF DISEASES

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Abstract. The purpose of the study is to summarize the experience and identify the features of the organization and provision of specialized medical care (SpMP) to victims of the Chernobyl accident on the basis of the A. M. Nikiforov All-Russian centre of emergency and radiation medicine of EMERCOM of Russia.

Materials and methods of research. Materials of the study were the data on types and volume of specialized medical assistance in 2014-2020 on the basis of the Centre; on the leading classes of diseases demanding specialized medical care in remote period to those affected by the Chernobyl accident.

Research results and their analysis.

1. The system of organization of specialized medical care for victims of the Chernobyl accident in the framework of the Union State of Russia – Belarus includes 5 main stages: planning, coordination, information and analytical, hospital and final – analytical stages.

2. The main reasons for hospitalization of victims of the Chernobyl accident were diseases of the circulatory system, of the digestive system and of the musculoskeletal system and connective tissue.

3. When providing therapeutic SpMP, special attention was paid to the diagnosis and correction of comorbid pathology; when providing surgical SpMP, to individual selection of anesthetic aids, the use of minimally invasive endoscopic surgical interventions and prevention of postoperative complications.

4. The main reasons for medical rehabilitation were diseases of the Central nervous system and sensory organs, diseases of the cardiovascular system, musculoskeletal system and peripheral nervous system.

Key words: Chernobyl accident, leading classes of diseases, liquidators of accident consequences, population, radiation-contaminated territories, specialized medical care, victims

Conflict of interest. The authors declare no conflict of interest

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СПЕЦИАЛИЗИРОВАННАЯ МЕДИЦИНСКАЯ ПОМОЩЬ ПОСТРАДАВШИМ ПРИ АВАРИИ НА ЧЕРНОБЫЛЬСКОЙ АЭС: ОСОБЕННОСТИ ОРГАНИЗАЦИИ, ВИДЫ И ОБЪЕМЫ, ВЕДУЩИЕ КЛАССЫ ЗАБОЛЕВАНИЙ

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Резюме. Цель исследования – обобщить опыт и выявить особенности организации и оказания специализированной медицинской помощи (СпМП) пострадавшим при аварии на Чернобыльской АЭС (ЧАЭС)на базе Всероссийского центра экстренной и радиационной медицины им. А.М.Никифорова (ВЦЭРМ) МЧС России. Материалы и методы исследования. Материалами исследования были данные о видах и объемах специализированной медицинской помощи, оказанной в 2014–2020 гг. на базе ВЦЭРМ, о ведущих классах заболеваний как причинах оказания специализированной медицинской помощи в отдаленном периоде пострадавшим при аварии на ЧАЭС.

Результаты исследования и их анализ.

- 1. Система организации оказания специализированной медицинской помощи пострадавшим при аварии на ЧАЭС в рамках Союзного государства Россия Беларусь включает в себя 5 основных этапов: планирование, согласование, информационно-аналитический, стационарный и заключительный аналитический этапы.
- 2. Основной причиной госпитализаций пострадавших при аварии на ЧАЭС являлись болезни системы кровообращения, заболевания органов пищеварения и болезни костно-мышечной системы и соединительной ткани.

- 3. При оказании СпМП терапевтического профиля особое внимание уделялось диагностике и коррекции коморбидной патологии; при оказании СпМП хирургического профиля индивидуальному подбору анестезиологического пособия, применению миниинвазивных эндоскопических хирургических вмешательств и профилактике послеоперационных осложнений.
- 4. Основной причиной проведения медицинской реабилитации являлись заболевания центральной нервной системы и органов чувств, заболевания сердечно-сосудистой системы, опорно-двигательного аппарата и периферической нервной системы.

Ключевые слова: авария на Чернобыльской АЭС, ведущие классы заболеваний, ликвидаторы последствий аварии, население, пострадавшие, радиационно загрязненные территории, специализированная медицинская помощь

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Introduction

A considerable part of the population of the Russian Federation and of the Republic of Belarus suffered from the large-scale accident at the Chernobyl nuclear power plant (ChNPP). Thus, the measures to eliminate its medical, sanitary, environmental and psychological consequences become a high priority for many years to come.

In this regard, the Parliament of the Russia-Belarus Union State, created on December 8, 1999, and its Standing Committee have identified measures to provide affordable and targeted specialized medical care (SMC) to victims of a radiation accident (RA) at the Chernobyl NPP as one of their operational priorities. In the Russian Federation, the categories of persons affected by the Chernobyl accident, include, first of all, the liquidators of the consequences of the accident (LCA) and the persons living (resided) in radiation-contaminated areas.

According to the Pension Fund of Russia data from the Federal Register of Persons Eligible for State Social Assistance, as of February 1, 2020, the casualty toll of the Chernobyl accident in Russia was 1,652,011 people, most of whom are people living (resided, evacuated) in the radiation-contaminated areas of Bryansk, Kaluga, Smolensk, Oryol and Tula regions, as well as Chernobyl NPP LCA participants, who were directly involved in eliminating the consequences of the accident in the area of a large-scale radiation catastrophe. These are, first of all, servicemen, employees of the Ministry of Internal Affairs of Russia, civilians (engineers, technicians, workers) sent to the area of the radiation disaster.

There are more than 1.5 million people in the Republic of Belarus. – mainly residents of the Gomel, Mogilev and Brest regions – being the casualties of the Chernobyl accident [1].

On 12th of September, 1991 in St. Petersburg on the basis of scientific and clinical departments of the Military Medical Academy named after S.M. Kirov (VMedA), the All-Russian Center for Environmental Medicine was created. Its main task was to provide medical assistance to casualties of the Chernobyl accident. In 1997, it became part of the EMERCOM as the All-Russian Center for Emergency and Radiation Medicine – VTsERM (hereinafter - VTsERM, Center), in 2006 VTsERM was named after Alexei Mikhailovich Niki-

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forov (1956-2006) –Corresponding Member of the Russian Academy of Medical Sciences, the founder and the first director of the Center.

VTsERM specialists have extensive experience in diagnostics, treatment, rehabilitation and examination of the health status of participants of LPA at the Chernobyl nuclear power plant, as well as of general population affected by the Chernobyl accident. From 1991 to 2020, on the basis of VTsERM more than 35 thousand victims of Chernobyl accident went through diagnostics, treatment as well as through the evaluation. The evaluation means the establishment of a cause-and-effect relationship between diseases, disability and death and the exposure to the radiation factor.

This research as well as scientific and practical work made by clinicians and scientists of VTsERM, resulted in the development and implementation of new medical technologies (methods, protocols, standards, etc.) providing specialized medical care to victims of the Chernobyl accident. The results of this long-term work are presented in monographs and guidelines [2–4].

The comprehensive medical care for victims of the Chernobyl accident is provided within the framework of programs and activities of the Russia-Belarus Union State. Its budgeting procedure has own specifics, which determines a number of their organizational and methodological features.

The purpose of the study is to generalize the experience and to identify the features of the organization and provision of specialized medical care to the victims of the Chernobyl accident on the basis of VTsERM.

Materials and research methods. The research materials were data on the types and volumes of specialized medical care provided in 2014–2020 on the basis of VTSERM, on the prevailing classes of diseases of victims of the Chernobyl accident, which formed the reasoning for the provision of specialized medical care in the remote period.

Research results and analysis. As the figure shows, the organization and the provision of specialized medical assistance to the victims of the Chernobyl accident (within the budget of the Union State) includes 5 main stages: planning, coordination, preliminary considerations, hospital treatment and results analysis.

Этапы организации оказания СпМП пострадавшим при аварии на Чернобыльской АЭС

The stages of organization of specialized medical care (SpMP) to victims of the accident at the Chernobyl nuclear power plant

1-й этап – планирование мероприятий по оказанию СпМП на следующий год, определение ее видов и объемов, необходимых финансовых средств, составление сметы расходов и технико-экономического обоснования. Этот этап реализуется с учетом листа ожидания, в который предварительно включают лиц из числа пострадавших при аварии на ЧАЭС, нуждающихся в оказании СпМП

Stage 1 - planning of activities for the provision of SpMP for the next year, determining its types and volumes, the necessary financial resources, drawing up cost estimates and feasibility studies. This stage is implemented with taking into account the waiting list, with previously includes people from among the victims of the Chernobyl accident who need SpMP

2-й этап – этап согласования – включает в себя представление Заказчику (МЧС России, Постоянный комитет Союзного государства) сметы и технико-экономического обоснования, их согласование, уточнение порядка и категории лиц для оказания СпМП, составление сводной сметы расходов всех участников мероприятий Союзного государства, ее утверждение Минздравом Республики Беларусь, Минздравом и МЧС России и согласование с Государственным секретарем Союзного государства

2nd stage - the stage of approval involves the submission to the Customer (EMERCOM of Russia, the Permanent Committee of the Union state) cost estimates and feasibility studies, their harmonization, clarification of order and categories of individuals for the provision of SpMP, the consolidated cost estimates of all participants of activity of the Union state, approving them by the Ministry of health of the Republic of Belarus, Ministry of health and EMERCOM of Russia and the coordination with the State Secretary of the Union state

3-й этап – информационно-аналитический – включает в себя:

- /- сбор и анализ информационно-аналитических данных о нуждающихся в оказании СпМП из числа пострадавших при аварии на ЧАЭС в Национальном радиационно-эпидемиологическом регистре и его региональных представительствах;
- рассылку информационных писем в субъекты РФ руководителям министерств (департаментов, комитетов) здравоохранения, руководителям Главных управлений МЧС России с последующим анализом полученных данных;
- отбор пациентов для оказания СпМП в соответствии с нормативной базой Союзного государства, включающей Положение о мероприятии, Положение о порядке отбора лиц, перечень категорий лиц, пострадавших при аварии на ЧАЭС;
- формирование потока пациентов для планового оказания СпМП, включая высокотехнологичную медицинскую помощь ВМП

 The 3rd stage information and analytical-includes:
- collection and analysis of information and analytical data on those in need of SpMP from among the victims of the Chernobyl accident, in the National radiation and epidemiological register and its regional offices;
- sending information letters to the subjects of the Russian Federation to the heads of ministries (departments, committees) of health, heads of The main departments of the EMERCOM of Russia with subsequent analysis of the data obtained;
- selection of patients for the provision of SpMP in accordance with the regulatory framework of the Union state, including the Regulations on the event, the Regulations on the procedure for selecting persons, the list of categories of persons affected by the Chernobyl accident;

 - formation of the flow of patients for the planned provision of SpMP, including high-tech medical care VMP

4-й этап – стационарное лечение – включает в себя:

- /- предоперационное обследование по установленному Минздравом России обязательному перечню исследований при оказании СпМП хирургического профиля и высокотехнологичной медицинской помощи;
- стабилизацию соматического состояния, включающую лечение коморбидной соматической патологии;
- предоперационное планирование при ВМП и непосредственное оказание СпМП, в том числе ВМП;
- раннюю послеоперационную реабилитацию в специализированном отделении медицинской реабилитации в условиях стационара

Stage 4 - inpatient treatment-includes:

- preoperative examination according to the mandatory list of studies established by the Ministry of health of the Russian Federation for the provision of surgical SpMP and high-tech medical care VMP;
- stabilization of the somatic state, including treatment of comorbid somatic pathology;
- preoperative planning for VMP and direct provision of SpMP, including VMP;
- early postoperative rehabilitation in a specialized Department of medical rehabilitation in a hospital

5-й этап – аналитический, заключительный – включает в себя:

- оценку качества оказания СпМП и эффективности лечения каждого пациента;
- составление промежуточных и итоговых аналитических отчетов, презентационных и других отчетных документов

Stage 5 - analytical, final-includes:

- assessment of the quality of SpMP provision and the effectiveness of treatment for each patient;
 - preparation of interim and final analytical reports, presentation and other reporting documents

Рисунок. Этапы организации оказания специализированной медицинской помощи пострадавшим при аварии на Чернобыльской АЭС **Figure.** The stages of organization of specialized medical care (SpMP) to victims of the accident at the Chernobyl nuclear power plant

It should be noted that each participant of the LPA at the Chernobyl NPP as well as any person living (resided) in the radiation-contaminated territories has 12.5 different diseases on average [3, 5-7]. 3-4 diseases of these 12,5 are major and require systematic treatment [3, 5-6].

The clinical polymorbidity urges the need to stabilize the somatic state and to treat a therapeutic pathology before and after performing complex surgical interventions, including the provision of high-tech medical care (HTMC).

The types and volumes of SMC provided on the basis of VTsERM clinics in outpatient and inpatient premises are presented in Table. 1.

As the above data shows, in 2014–2019 the specialized medical care was provided to 8024 victims of the Chernobyl accident in outpatient premises, as well as in day and round-the-clock patient facilities on the basis of VTsERM clinics. Taking into account the plan for 2020, in 2014-2020 the first aid will be provided to 8831 victims, which is only 0.5% of their total number. However, it is obvious that the main volumes of SMC for persons of the indicated categories are delivered at their places of residence in the regions. The patients are treated in VTsERM only in The volume of specialized medical care provided, including high-tech medical care, and medical rehabilitation of 4383 victims of the Chernobyl accident who underwent inpatient treatment in VTsERM multidisciplinary clinics No. 1 and No. 2 in the framework of the Union State programs, has been analyzed. Characteristics of the main part of those treated in the round-the-clock hospital: planned admission - 95%, age - 60 years or more, men - 90%.

Volumes of specialized, including high-tech, medical care and medical rehabilitation in the 24-hour VTsERM hospital in 2014–2019 for the main classes of ICD-10 diseases are presented in Table. 2.

For 6 years, the main cause for hospitalization of victims to the multidisciplinary clinics of VTsERM has been the circulatory system diseases. The share of patients with these diseases was 46.3%. Among diseases of the circulatory system ischemic heart disease (15.8%), cerebrovascular diseases (12.8%), high blood pressure associated diseases (10.1%) predominate (see Table. 2; Table. 3).

The second leading (13.4%) cause for hospitalization was digestive system diseases, among which diseases of the esophagus, gastritis, duodenitis, gastric ulcer and duodenal ulcer predominated. The third leading (12.6%) cause was the musculoskeletal and connective tissue diseases, among which arthro- and dorsopathies predominated (see Table 3).

Diseases of the endocrine system were the cause of hospitalization in 7.9% of cases; respiratory diseases – 7.4; neoplasms – 3.2; diseases of the eye and its adnexa – 4.5; diseases of the nervous system – in 1.9% of cases.

Comparison of these data with the National Radiation and Epidemiological Register (NRER) data on the incidence of the main classes of diseases is presented in Table. 4 [8].

Diseases prevailing among victims of the Chernobyl accident are: circulatory system diseases: 46.3% – according to VTsERM; 27.0% – according to NRER; nervous system diseases, diseases of the eye and its adnexa: 6.4% – according to VTsERM; 14.0% – according to NRER; digestive organs diseases: 13.4% – according to VTsERM; 12.5% – according to NRER.

Evaluation of the consistency of VTsERM and NRER data using Spearman's rank correlation proved the identity of both data series in both samples, p <0.05 (see Table 4).

It should be noted that the therapeutic SMC was provided in inpatient conditions to patients with somatic pathology, including, first of all, diseases of the cardiovascular, neurological, pulmonological, gastroenterological and en-

Таблица 1/Table 1

Виды и объемы специализированной медицинской помощи, оказанной пациентам в амбулаторно-поликлинических и стационарных условиях на базе ВЦЭРМ в 2014–2020 гг., чел.

Types and volumes of specialized medical care provided to victims in outpatient and inpatient settings on the basis of VCERM in 2014-2020, people

Виды специализированной медицинской помощи Types of specialized medical care	2014	2015	2016	2017	2018	2019	2020 (план) Plan 2020	Итого Total
Амбулаторно-поликлиническая – АП								
Outpatient – AP	1245	885	810	-	_	_	_	2940
Дневной стационар – ДС Day hospital –DS	_	-	60	219	250	172	170	871
СпМП – терапевтический, хирургический профиль – стационар SMP-therapeutic, surgical profile - hospital	489	254	727	487	664	529	430	3580
Высокотехнологичная медицинская помощь – ВМП High-tech medical care – VMP	109	55	169	81	142	140	147	843
Медицинская реабилитация – МР –								
стационар Medical rehabilitation – MR-hospital	45	40	184	84	103	81	60	597
Bcero – СПМ, ВМП, MP Subtotal – SMP, VMP, MP	643	349	1080	652	909	750	637	5020
Bcero – АП, ДС, СМП, ВМП, МР Total – AP, DS, SMP, VMP, MP	1888	1234	1950	871	1159	922	807	8831

docrinological profile. At the same time, special attention was paid to the diagnosis and pharmacological correction of comorbid pathology.

Specialized surgical medical care, not corresponding to high-tech profile, was provided in a round-the-clock hospital using advanced medical technologies, paying special attention to the individual selection of anesthetic treatment with account taken of comorbid therapeutic pathologies, and to the use of minimally invasive endoscopic surgical interventions as well as to the prevention of postsurgical complications.

High-tech medical care turned out to be in demand in such fields as cardiovascular surgery, traumatology and orthopedics, ophthalmology.

Таблица 2/Table 2

Основные классы заболеваний и объемы специализированной медицинской помощи, оказанной пациентам в условиях круглосуточного стационара в 2014–2019 гг.

Main classes of diseases and the volume of specialized medical care provided to victims in a 24-hour hospital in 2014-2019

Класс Class	Название класса (код) Name of the class (code)	Число пациентов, чел. Number of patients, people						Итого, чел./% Total, people/%
			2015	2016	2017	2018	2019	,
II	Новообразования (C00–D48), из них: Neoplasms (C00–D48), from them: злокачественные (C00–C97)	21	12	27	27	27	26	140/3,2
	malignant (C00-C97) доброкачественные (D10-D36) benign (D10-D36)	15	8	3	12 15	18	14	91/2,1 49/1,1
III	Болезни крови, кроветворных органов и отдельные нарушения, вовлекающие иммунный механизм (D50–D89) Diseases of the blood, hematopoietic organs and individual disorders involving the immune mechanism (D50-D89)	1	0	2	3	7	4	17/0,4
IV	Болезни эндокринной системы, расстройства питания и нарушения обмена веществ (E00–E89): Diseases of the endocrine system, eating disorders and metabolic disorders (E00-E89):	42	25	76	63	73	69	348/7,9
	в том числе сахарный диабет (E10-E14) including diabetes mellitus (E10-E14)	25	20	72	57	67	67	308/7,0
VI	Болезни нервной системы (G00–G98) Diseases of the nervous system (G00-G98)	5	7	22	20	20	9	83/1,9
VII	Болезни глаза и его придаточного аппарата (H00–H59) Diseases of the eye and its appendage (H00-H59)	68	21	20	10	38	41	198/4,5
IX	Болезни системы кровообращения (100–199), из них: Diseases of the circulatory system (100-199), including: болезни, характеризующиеся повышенным артериальным давлением (110–113)	276	152	538	289	450	323	2028/46,3
	diseases characterized by high blood pressure (110-113)	43	31	86	60	140	82	442/10,1
	ишемическая болезнь сердца (120–125) ischemic heart disease (120-125) другие болезни сердца (130–151)	116	37	192	127	116	105	693/15,8
	other heart diseases (130-151) цереброваскулярные болезни (160-169)	7	6	34	21	26	22	116/2,6
	cerebrovascular diseases (160-169) атеросклероз артерий конечностей, тромбангиит облитерирующий	80	55	170	51	125	81	562/12,8
	(170–179) atherosclerosis of arteries of the extremities, thromboangiitis obliterating (170-179)	29	18	50	26	39	27	189/4,3
.,	болезни вен, лимфатических сосудов и лимфатических узлов (180–189) diseases of the veins, lymph vessels and lymph nodes (180-189)	1	5	6	4	4	6	26/0,6
X	Болезни органов дыхания (J00–J98) Respiratory diseases (J00-J98)	46	29	76	56	61	58	326/7,4
XI	Болезни органов пищеварения (K00–K92) Digestive diseases (K00-K92)	69	57	156	108	108	91	589/13,4
XIII	Болезни костно-мышечной системы и соединительной ткани (M00–M99) Musculoskeletal and connective tissue diseases (M00-M99)	99	34	133	67	102	117	552/12,6
XIV	Болезни мочеполовой системы (N00–N99) Urogenital diseases (N00-N99)	10	10	11	3	12	10	56/1,4
XVII	Врожденные аномалии [пороки развития], деформации и хромосомные нарушения (Q00–Q99) Congenital malformations, deformities, and chromosomal abnormalities (Q00-Q99)	0	1	2	0	2	0	5/0,1
XIX	Травмы, отравления и некоторые другие последствия воздействия внешних причин (S00–T98) Injuries, poisoning and some other consequences of external causes (S00-T98)	1	1	7	3	9	2	23/0,5
XXI	Факторы, влияющие на состояние здоровья населения и обращения в медицинские организации (Z00–Z99) Factors affecting the health of the population and treatment in medical organizations (Z00-Z99)	5	0	10	3	0	0	18/0,4
	Bcero / Total	643	349	1080	652	909	750	4383/100,0

Table 5 shows generalized data on the types and volumes of medical rehabilitation, carried out at the VTsERM in 2014–2020 within the framework of the activities of the Union State.

Medical rehabilitation of patients with the cardiovascular system diseases ranks second (33.0%). Medical rehabilitation of patients with the musculoskeletal system and peripheral nervous system diseases ranks third with 31.3%.

Medical rehabilitation was carried out using such high-tech methods as a pulsed magnetic field, local cryotherapy with instantaneous electrical stimulation, therapeutic laser-LED therapy, as well as robotic mechanotherapy and applied kinesitherapy.

Special attention was paid to the development of comprehensive individual programs for the restoration and maintenance of health. The rehabilitation program was prepared individually for each patient, taking into account the severity of his/her condition, availability of rehabilitation potential and of concomitant diseases.

The use of modern equipment and robotic technologies allowed to achieve the best possible results in the restoration of motor skills.

Medical rehabilitation was performed by a multidisciplinary rehabilitation team consisting of a therapist, neurologist, cardiologist, traumatologist-orthopedist, physical therapy doctor, physiotherapist, reflexotherapist, chiropractor, clinical psychologist, speech therapist-aphasiologist, rehabilitation nurses. Each specialist gave own assessment of the patient's condition and, interacting with colleagues, carried out a targeted intervention. As a result, an optimal treatment result was achieved, and the patient returned to normal living as quickly as possible.

Conclusions

- 1. The system of the provision of specialized medical care to victims of the Chernobyl accident within the Union State includes 5 main stages: planning, coordination, preliminary considerations, hospital treatment and results analysis.
- 2. The main reasons for hospitalization of victims of the Chernobyl accident were diseases of the circulatory system, diseases of the digestive system and diseases of the musculoskeletal system and connective tissue.

Таблица 3/Table 3

Структура трех основных классов болезней пациентов при оказании им специализированной медицинской помощи в условиях круглосуточного стационара в 2014–2019 гг. Structure of the three main classes of diseases in the provision of specialized medical care to victims in a 24-hour hospital in 2014-2019

Класс болезней Classes of diseases	Код по МКБ-10-го пересмотра ICD Code -	Число пациентов, чел. Number of patients, people						Итого, чел./% Total, people/%
	10th revision	2014	2015	2016	2017	2018	2019	, 1 L V
Болезни системы кровообращения: Diseases of the circulatory system:	100–199	276	152	538	289	450	323	2028/100,0
болезни, характеризующиеся повышенным артериальным давлением diseases characterized by high blood pressure	110–113	43	31	86	60	140	82	442/21,8
ишемическая болезнь сердца – ИБС ischemic heart disease	120–125	116	37	192	127	116	105	693/34,2
другие болезни сердца other heart diseases	130–151	7	6	34	21	26	22	116/5,7
цереброваскулярные болезни cerebrovascular diseases	160–169	80	55	170	51	125	81	562/27,7
атеросклероз артерий конечностей, тромбангиит облитери- рующий atherosclerosis of the arteries of the extremities, thrombangiitis obliterating	170–179	29	18	50	26	39	27	189/9,3
болезни вен, лимфатических сосудов и лимфатических узлов diseases of the veins, lymphatic vessels and lymph nodes	180–189	1	5	6	4	4	6	26/1,3
Болезни органов пищеварения: Diseases of the digestive system:	K00-K92	69	57	156	108	108	91	589/100,0
болезни пищевода, желудка и двенадцатиперстной кишки diseases of the esophagus, stomach and duodenum	K20-K31	23	25	65	16	16	4	149/25,3
грыжи /hernias	K40-K46	1	3	2	10	4	4	24/4,1
неинфекционный энтерит и колит noninfectious enteritis and colitis	K50-K52	_	_	_	2	1	1	4/0,7
другие болезни кишечника /other bowel diseases	K55-K63	_	_	2	2	1	3	8/1,4
болезни брюшины /peritoneal diseases	K65-K67	_	_	_	1	_	_	1/0,2
болезни печени/ liver diseases	K70-K77	_	25	68	53	1	_	147/25,0
болезни желчного пузыря, желчевыводящих путей и поджелудочной железы diseases of the gallbladder, biliary tract and pancreas	K80-K87	45	4	19	24	85	79	256/43,5
Болезни костно-мышечной системы и соединительной ткани: Diseases of the musculoskeletal system and connective								
tissue:	M00-M99	99	34	133	67	102	117	552/100,0
артропатии /arthropathies	M00-M25	58	23	69	35	59	69	313/56,7
системные поражения соединительной ткани systemic connective tissue lesions	M30-M36	_	_	_	1	_	_	1/0,2
дорсопатии /dorsopathy	M40-M54	30	10	47	26	37	44	194/35,1
остеопатии и хондропатии /osteopathy and chondropathy	M80-M94	11	1	17	5	6	4	44/8,0

- 3. When providing therapeutic SMC, special attention was paid to the diagnosis and correction of comorbid pathology; when providing surgical SMC to the individual selection of anesthesia, to the use of minimally invasive endoscopic surgical interventions and to the prevention of postsurgical complications.
- 4. The main reasons for medical rehabilitation were the diseases of the central nervous system and sensory or-

gans, as well as the diseases of the cardiovascular system, musculoskeletal system and peripheral nervous system. Medical rehabilitation was carried out by multidisciplinary teams using high-tech methods, with special attention paid to the implementation of comprehensive individual programs for recovery and health maintenance, taking into account the severity of the condition, the rehabilitation potential and comorbid pathologies.

Таблица 4/ Table 4

Основные классы заболеваний пациентов в 2014–2019 гг., чел./%

The basic classes of illnesses of patients in 2014-2019, people/%

Класс Class	Название класса (код) Ranked list of priority measures	Данные ВЦЭРМ — 2014—2019 гг. Data from ARCERM 2014—2019	Данные HPЭP – 2018 Data from the NRER – 2018
II	Новообразования (C00-D48) Neoplasms (C00-D48)	140/3,2	29100/3,2
III	Болезни крови, кроветворных органов и отдельные нарушения, вовлекающие иммунный механизм (D50–D89) Diseases of the blood, hematopoietic organs and individual disorders involving the immune mechanism (D50-D89)	17/0,4	3900/0,4
IV	Болезни эндокринной системы, расстройства питания и нарушения обмена веществ (E00–E89) Diseases of the endocrine system, eating disorders and metabolic disorders (E00-E89):	348/7,9	66600/7,6
VI	Болезни нервной системы (G00-G98) Diseases of the nervous system (G00-G98)		
VII	Болезни глаза и его придаточного аппарата (H00–H59) Diseases of the eye and its appendage (H00-H59)	281/6,4	126000/14,0
IX	Болезни системы кровообращения (100–199) Diseases of the circulatory system (100-199)	2028/46,3	242300/27,0
Χ	Болезни органов дыхания (J00–J98) Respiratory diseases (J00-J98)	326/7,4	103400/11,6
XI	Болезни органов пищеварения (КОО–К92) Digestive diseases (КОО-К92)	589/13,4	110400/12,5
XIII	Болезни костно-мышечной системы и соединительной ткани (M00–M99) Musculoskeletal and connective tissue diseases (M00-M99)	552/12,6	111300/13,5
XIV	Болезни мочеполовой системы (N00–N99) Urogenital diseases (N00-N99)	56/1,4	61300/7,8
XVII	Врожденные аномалии [пороки развития], деформации и хромосомные нарушения (Q00–Q99) Congenital malformations, deformities, and chromosomal abnormalities (Q00-Q99)	5/0,1	2600/0,5
XIX	Травмы, отравления и некоторые другие последствия воздействия внешних причин (S00–T98) Injuries, poisoning and some other consequences of external causes (S00-T98)	23/0,5	17400/1,9
XXI	Факторы, влияющие на состояние здоровья населения и обращения в медицинские организации (Z00–Z99) Factors affecting the health of the population and treatment in medical organizations (Z00-Z99)	18/0,4	
	Bcero / Total	4383/100,0	895800/100,0

Таблица 5/Table 5

Виды и объемы медицинской реабилитации пациентов на базе ВЦЭРМ в 2014-2020 гг.

Types and volumes of medical rehabilitation of patients on the basis of ARCERM in 2014-2020

Вид медицинской реабилитации Types of medical rehabilitation		Число пациентов, чел. / Number of patients, people						
		2015	2016	2017	2018	2019	2020 (план) Plan 2020	Total, people/%
Реабилитация больных с заболеваниями центральной нервной системы и органов чувств								
Rehabilitation of patients with diseases of the central nervous system and sensory organs	5	19	59	30	46	32	22	213/35,7
Реабилитация больных с заболеваниями опорно-двигательного аппарата и периферической нервной системы								
Rehabilitation of patients with diseases of the musculoskeletal system and peripheral nervous system	12	9	49	22	34	33	28	187/31,3
Реабилитация больных с заболеваниями сердечно-сосудистой системы Rehabilitation of patients with diseases of the cardiovascular system	28	12	76	32	23	16	10	197/33,0
Bcero /Total	45	40	184	84	103	81	60	597/100,0

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