

<https://doi.org/10.23934/2223-9022-2020-9-2-259-263>

## Organization of First Aid in the Arkhangelsk Region

A.V. Baranov<sup>1, 2</sup>

Central Research Laboratory

<sup>1</sup> Northern State Medical University

51 Troitsky Proezd, Arkhangelsk 163000, Russian Federation

<sup>2</sup> Department of Theoretical Foundations of Physical Culture, Sports and Health Cherepovets State University

8 Sovetsky Proezd, Vologda Oblast, Cherepovets 162612, Russian Federation

\* **Contacts:** Aleksandr V. Baranov, Cand. Med. Sci., Researcher at the Central Research Laboratory of Northern State Medical University, Leading Researcher at Cherepovets State University.

Email: baranov.av1985@mail.ru

**BACKGROUND** The development and implementation of widespread training for rules, techniques and methods of providing first aid to the widest possible range of people will significantly reduce the level of disability and mortality among victims of road traffic accidents (RTAs).

**AIM OF STUDY** To study the organization of first aid for the victims in the Arkhangelsk region.

**MATERIAL AND METHODS** Part 1. The journals of registration of attendance at classes with a trained contingent in the educational-methodical department of the School of Disaster Medicine of the Territorial Center for Disaster Medicine of the Arkhangelsk Region for the period from 01.01.2012 to 12.31.2018 are analyzed.

Part 2. We selected 906 medical records of patients (003/u) affected by an accident on the federal highway M-8 "Kholmogory" and treated in hospitals of Arkhangelsk region, admitted acutely in period from 01.01.2012 till 31.12.2018.

The study was conducted according to the criteria of retrospective continuous documentary observation. As a criterion of statistical significance, the probability of a random error of less than 5% ( $p < 0.05$ ) was applied using the correction for multiple comparisons (Bonferroni correction).

**CONCLUSION** 1. The educational activities of the TCDH of the Arkhangelsk Region over a seven-year period are characterized by a significant increase in the total number of trained cadets ( $p < 0.001$ ); 2-fold increase in the number of trained motor vehicle drivers ( $p < 0.001$ ) and employees of Ministry of Emergency Situations and Russian Interior Ministry ( $p < 0.001$ ).

2. The first aid to injured in an accident on the federal highway M-8 Kholmogory in the Arkhangelsk Region was provided in 65 cases (7.2%); in almost 90% of cases, first aid was recorded in the Arkhangelsk and Severodvinsk medical districts of the Arkhangelsk region ( $p < 0.001$ ).

**Keywords:** first aid, training on first aid methods of administering, road-traffic accident, FAD M-8 Kholmogory, Arkhangelsk Region

**For citation** Grebenchikov OA, Shpichko AI, Yevseyev AK, Molchanov IV, Shabanov AK, Khusainov SZ., et al. Neuroprotective Properties of Xenon According to Experimental Studies (a Literature Review). *Russian Sklifosovsky Journal of Emergency Medical Care*. 2020;9(2):259–263. <https://doi.org/10.23934/2223-9022-2020-9-2-259-263> (in Russ.)

**Conflict of interest** Author declare lack of the conflicts of interests

**Acknowledgments, sponsorship** The study had no sponsorship

**Affiliations**

Aleksandr V. Baranov	Cand. Med. Sci., Researcher at the Central Scientific and Research Laboratory of Northern State Medical University, Leading Researcher, Cherepovets State University; <a href="http://orcid.org/0000-0002-3543-1738">http://orcid.org/0000-0002-3543-1738</a> , baranov.av1985@mail.ru
----------------------	--

## INTRODUCTION

Prior to the arrival of medical personnel from ambulance or disaster medicine teams, first aid in life-threatening and health-threatening conditions should be provided by any bystander of this situation [1-3]. Special attention should be paid to regular training in the techniques and methods of providing first aid to all road users [4, 5]. The results of numerous studies show a high willingness to participate in providing first aid to victims, however, the reason for the failure to take false rescue measures is a low level of knowledge and skills, fear of criminal prosecution in case of an unfavorable outcome, and an elementary fear of harm [6]. Consequently, the development and implementation in practice of widespread training in the rules, techniques and methods of providing first aid to the widest possible circle of people will significantly reduce the level of disability and mortality among victims of road traffic accidents (RTA).

**Aim of study:** to study the organization of first aid to victims in the Arkhangelsk region.

### Research objectives:

1. Give a description of the educational activities of the Territorial Center for Disaster Medicine (TCDM) of the Arkhangelsk region to teach the population the rules, techniques and methods of providing first aid to victims in various emergency situations (ES).

2. To analyze the delivery of first aid to victims of road traffic accidents on the Federal Highway M-8 "Kholmogory" in the Arkhangelsk region.

## MATERIAL AND METHODS

The study consisted of 2 parts.

1<sup>st</sup> part. Registration logs of attendance of the trained contingent in the educational and methodological department (EMD) School of Disaster Medicine of the TCDM of the Arkhangelsk region for the period from Jan 01, 2012 to Dec 31, 2018 were analyzed.

2<sup>nd</sup> part. Medical records of 906 patients (f.003 / u) were selected, who were treated in hospitals of the Arkhangelsk region and arrived according to emergency indications during the period from Jan 01, 2012 to Dec 31, 2018.

The study was carried out according to the criteria of retrospective continuous documentary observation.

**Inclusion criteria:**

1. Gender: male and female.

2. Victims of road accident on M-8 "Kholmogory" highway in the Arkhangelsk region, who received inpatient treatment.

3. Injury from 2012 to 2018 inclusive.

Exclusion criteria:

1. The age <18 years.

2. Absence of trauma in an accident in history.

To carry out the statistical analysis, the licensed package of applied statistical programs *SPSS 22* was used. The distribution was taken as abnormal; for quantitative features, mean values were calculated - median, 1st and 3rd quartiles. When comparing two independent groups, the Mann – Whitney test was used, and the Kruskal – Wallis test for several groups. When comparing the frequency values of the analyzed parameters in the two groups,  $\chi^2$  test was used.

As a criterion of statistical significance, the probability of random error less than 5% ( $p < 0.05$ ) was chosen using the correction for multiple comparisons (Bonferroni correction).

The study was carried out in accordance with the ethical principles set out in the Declaration of Helsinki developed by the World Medical Association. The research protocol was approved by the expert council on biomedical ethics of the Federal State Budgetary Educational Institution of Higher Education "Northern State Medical University", Arkhangelsk, protocol No. 08 / 11-17 dated November 29, 2017 .

## RESULTS

In 2006, within the framework of the federal target program, a complete training equipment was purchased at the TCDM of the Arkhangelsk region and regular classes with the population began to teach the rules, techniques and methods of providing first aid to victims of road accidents and other emergencies.

During the period from 2012 to 2018 inclusively, 22,878 students were trained in the educational and methodological department (EMD) of the School of Disaster Medicine of the TCDM of the Arkhangelsk Region. Considering the dynamics of the total number of the trained contingent, its significant quantitative growth ( $p < 0.001$ ) was revealed from 2,498 in 2012 to 3,455 students in 2018 (Table 1).

Table 1

The dynamics of the number of students trained on first aid in the TCDM of the Arkhangelsk Region for the period 2012–2018, abs. (%)

	Years						
	2012	2013	2014	2015	2016	2017	2018
Number of trainees, abs. (%)	2498 (10.9%)	2170 (9.5%)	3809 (16.6%)	4350 (19.0%)	2803 (12.3%)	3793 (16.6%)	3455* (15.1%)

Note: \* —  $p < 0.001$  (2012 compared to 2018) ( $\chi^2$  criterion),  $p < 0.007$  was statistically significant at pairwise comparison

First aid training is provided to attendants of driving schools, employees of the Ministry of Internal Affairs and the Ministry of Emergency Situations of Russia, medical workers, as well as representatives of various organizations and departments of the Arkhangelsk region, who, by virtue of their service, must have the skills of first aid (Fig. 1).

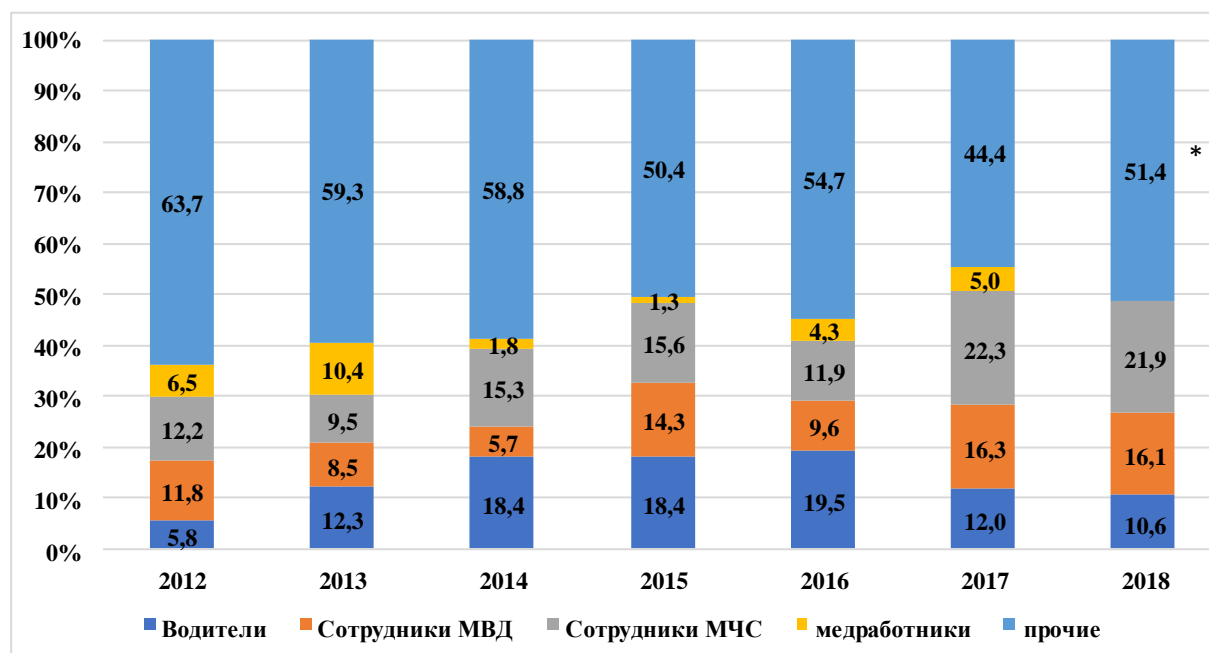


Fig. 1. The dynamics of the proportion of students in first aid at the Territorial Center of Disaster Medicine of the Arkhangelsk Region, depending on the categories for the period of 2012–2018

Note: \* -  $p < 0.001$  (2012 in comparison to 2018) (criterion  $\chi^2$ ),  $p < 0.007$  was statistically significant at pairwise comparison and accepted

In the training of drivers of vehicles a significant, more than two-fold increase in number from 2012 to 2018 ( $p < 0.001$ ) was revealed, which, in our opinion, is associated with an increase in the number of driving schools in the Arkhangelsk region, as well as personal motivation of drivers.

When analyzing the training of personnel of the Ministry of Emergency Situations and the Ministry of Internal Affairs, it was noted that the maximum number of trainees underwent training in 2017, with some slight decline in 2018, but a significant increase in their number was revealed compared to 2012 ( $p < 0.001$ ).

In a number of cases, paramedics of various specialties (mainly paramedics of rural health posts, central regional and district hospitals of the Arkhangelsk region) are trained at the TCDM to provide more detailed first aid to those injured in various emergencies. We did not find any statistically reliable dynamics among the listeners in this category.

Among the heads of state and commercial organizations of the region, there is a great interest in training their employees. Our graduates are employees of the road service network, flight attendants, train carriages, representatives of security structures, rescuers of various departments and other specialists whose work is somehow connected with people. So, if in 2012 1,592 people were trained, then already in 2014 their number increased to 2,240, but by 2018 there has been a slight decrease in the number of graduates, which is probably associated with the onset of a less favorable economic situation in Russia and, consequently, an attempt to save money necessary for training employees, which can explain the decline in their share by 2018.

When analyzing the provision of first aid to those injured in an accident on M-8 "Kholmogory" highway over a 7-year period, we found that only in 65 accidents (7.2%) there is reliable data on the provision of first aid to victims. In all other cases, either there is no data on the provision of assistance to the injured person, or there is reliable data on its non-provision ( $p < 0.001$ ).

It was found that in more than half of the cases (47, 72.3%) ( $p < 0.001$ ), first aid to victims of road accidents before the arrival of medical workers of ambulance services or disaster medicine was carried out by employees of the traffic police, the Ministry of Emergencies or other rescue teams, who arrived at the crash site first. In all other cases, assistance was provided by eyewitnesses or the participants of the D TP on the FAD M-8 "Kholmogory" in the Arkhangelsk region.

As road users, victims who received first aid were distributed as follows: 25 (38.5%) - vehicle drivers, 18 (27.7%) - passengers, 14 (21.5%) - pedestrians, 8 (12.3%) - motorcyclists.

By the nature of the injury, among the road traffic accident participants who received first aid, 29 people (44.6%) received severe concomitant injuries, 14 (21.5%) - multiple injuries, the remaining 22 (33.9%) - isolated injuries.

It is interesting to note that over the 7 years of study of cases of road traffic injuries on M-8 "Kholmogory" highway in the Arkhangelsk region, a rather interesting dynamics of the number of cases of on the highway with bystanders from the minimum values (4 cases) in 2012 to the maximum in 2018 (12 cases).

On the basis of the proportion who received first aid to the injured, we revealed that the most often - in 11.1% of all injured in the health districts, it was provided in Severodvinsk, the second place ranking - 5.9% - in Arkhangelsk and third - 5.7% - Velsk medical region (Table 2), but the differences are not statistically significant.

Table 2

**Distribution of the number of victims who have received first aid in reference to all affected in medical districts of Arkhangelsk Region**

Medical District	Number of victims	First Aid Provided
Severodvinsk	197 (21.7%)	22 (11.1%)
Arkhangelsk	589 (62.8%)	35 (5.9%)
Velsk	140 (15.5%)	8 (5.7%)
Total	907 (100%)	65 (7.2%)

In total, in the Severodvinsk and Arkhangelsk medical districts there were 57 cases of first aid to victims: 87.7%, of all cases of assistance provided in the study region, ( $p < 0.001$ ), which can possibly be explained by the fact that on the basis of the TCDM of the Arkhangelsk region for more than 10 years, the SMD "School of Disaster Medicine" has been operating, which, on a year-round basis, conducts training in the rules, techniques and methods of providing first aid to a very large contingent of students, where employees of structures based mainly in the largest cities (Arkhangelsk or Severodvinsk) of the surveyed receive knowledge and professional competencies.

Considering the first aid provided to those injured in accidents on M-8 "Kholmogory" highway in the Arkhangelsk region, we note that the following was done: immobilization of the injured segment - 48 cases (73.8%); artificial ventilation in conjunction with chest compressions - 11 (16.9%) and bleeding arrest - 6 cases (9.3%).

## DISCUSSION

The data obtained in a study on the organization of first aid in the Arkhangelsk region are confirmed in the dissertation work of M.G. Kavalsky, who notes that in  $84.9 \pm 2.5\%$  of cases, first aid was not provided to the injured in an accident at all, and only 1% of the victims were completely provided with it [7]. A.A. Chursin in his study points out that untimely and inadequate assistance took place in 97.1% of cases and was one of the reasons for the development of complications and death of victims in the absence of injuries incompatible with life, and only 3% of bystanders may adequately provide first aid [8]. Regarding training in the provision of first aid to employees of the Ministry of Internal Affairs of Russia, K.I. Lysenko focuses on the fact that their training is insufficient and heterogeneous, staff poorly know the rules of first aid and are not confident in their knowledge, and about 40% of them think that they can not provide first aid [6]. B.T. Gandzhurova argues that the system of first aid training for vehicle drivers

is ineffective, as a result of which about 90% of driving school graduates have an unsatisfactory level of knowledge and skills in providing first aid to injured persons [9]. V.G. Avdeyeva in her work notes that the state of training of special contingents and the population cannot provide a high-quality level of first aid to the injured [10].

According to our data, the educational activities of the TCDM of the Arkhangelsk region over a seven-year period are characterized by:

- a progressive increase in the total number of attendants trained in techniques and methods of providing first aid from 2,498 people in 2012 to 3,455 in 2018 ( $p < 0.001$ );
- a twofold increase in the number of trained vehicle drivers ( $p < 0.001$ );
- an increase in the number of trained employees of the Ministry of Emergencies and the Ministry of Internal Affairs of Russia ( $p < 0.001$ ).

## CONCLUSION

Summarizing the study first aid to injured in road traffic accidents on the federal highway M-8 "Kholmogory" in the Arkhangelsk region, we conclude:

- only in 65 cases (7.2%) there is reliable data on the provision of first aid to victims;
- almost 90% of cases ( $p < 0.001$ ) of providing first aid to victims of road traffic accidents were recorded in the Arkhangelsk and Severodvinsk medical districts, where the population is trained on the rules, techniques and methods of its provision on an ongoing basis in the Territorial Center for Disaster Medicine of the Arkhangelsk Region.

## FINDINGS

1. The educational activity of the Territorial Center for Disaster Medicine of the Arkhangelsk Region over the 7-year period is characterized by a significant increase in the total number of trained attendants ( $p < 0.001$ ); a two-fold increase in the number of trained vehicle drivers ( $p < 0.001$ ) and employees of the Ministry of Emergencies and the Ministry of Internal Affairs of Russia ( $p < 0.001$ ).

2. First aid to people injured in road accidents on the Federal highway M-8 "Kholmogory" in the Arkhangelsk region was provided in 65 cases (7.2%); in almost 90% of cases, the provision of first aid was observed in the Arkhangelsk and Severodvinsk medical districts of the Arkhangelsk region ( $p < 0.001$ ).

## REFERENCES

1. Dezhurny LI, Boyarintsev VV, Neudahin GV. The System of First Aid in the Russian Federation and its Interaction With the Emergency Services. *Emergency Medical Care*. 2013; 4 (2): 44-50. (In Russ.)
2. Kuz'min AG, Nosov AV. Teaching and Methodic Centre for First Aid Delivery Technique Teaching within Structure of Territorial Center for Disaster Medicine: Organization and Legal Aspects of Formation and Efficient Functioning. *Disaster Medicine*. 2014; 1: 38-40. (In Russ.)
3. Mikhaylova YuV, Son IM, Dezhurny LI, Khalmuratov AM. Printsipy sozdaniya i funktsionirovaniya sistemy pervoy pomoshchi v Rossii. *Manager Zdravookhraneniya*. 2008; 3: 6-9. (In Russ.)
4. Baranov AV, Morshnev VA, Petchin IV, Barachevsky YuE, Klyuchevsky VV. Analysis of educational activity of territorial center of disaster medicine in Arkhangelsk region. *Vestnik Rossiyskoy Voenno-Meditsinskoy Akademii*. 2017; 1 (57): 185-188. (In Russ.)
5. Baza nov SV. Obucheniye sotrudnikov spetsial'nykh sluzhbb, uchastvuyushchikh v likvidatsii posledstviy dorozhno-transportnykh proissheshtviy v Ivanovskoy oblasti, priyam okazaniya pervoy pomoshchi. *Mezhdunarodnyy zhurnal prikladnykh i fundamental'nykh issledovaniy*. 2012; 7: 108. (In Russ.)
6. Lysenko KI. *Mediko-organizatsionnye meropriyatiya pervoy pomoshchi postradavshim v dorozhno-transportnykh proissheshtviyakh: Dr. Med. Sci. Diss. Synopsis*. Moscow. 2011. Available at: [https://rusneb.ru/catalog/000200\\_000018\\_RU\\_NL\\_R\\_bibl\\_1904136/viewer/](https://rusneb.ru/catalog/000200_000018_RU_NL_R_bibl_1904136/viewer/) (Accessed 05/25/2020). (In Russ.)
7. Kavalerskiy GM. *Optimizatsiya okazaniya meditsinskoy pomoshchi postradavshim v dorozhno-transportnykh proissheshtviyakh na primere Krasnogorskogo munitsipal'nogo rayona: Cand. Med. Sci. Diss. Synopsis*. Moscow. 2011. Available at: <https://search.rsl.ru/ru/record/01004609785> (Accessed 05/25/2020). (In Russ.)
8. Chursin AA. Modelirovaniye, algoritimizatsiya i ratsionalizatsiya okazaniya pervoy meditsinskoy pomoshchi sotrudnikami sluzhbb bezopasnosti postradavshim v mikrosotsial'nykh konfliktakh: *Cand. Med. Sci. Diss. Synopsis*. Voronezh. 2007. Available at: <https://search.rsl.ru/ru/record/01003159166> (Accessed 05/25/2020). (In Russ.)
9. Gandzhurova BTs. *Sovershenstvovaniye mediko-organizatsionnykh meropriyatiy okazaniya postradavshim v dorozhno-transportnykh proissheshtviyakh: Cand. Med. Sci. Diss. Synopsis*. Moscow. 2008. Available at: <https://search.rsl.ru/ru/record/01003171559> (Accessed 05/25/2020). (In Russ.)
10. Avdeeva VG. *Organizatsionno-funktsional'naya model tipovoy obrazovatel'no-metodicheskoy sistemy sluzhby meditsiny katastrof regional'nogo urovnya: Cand. Med. Sci. Diss. Synopsis*. Moscow. 2006. Available at: <http://smkpermu.ru/upload/iblock/64e/64e7b55ce319d48732ca7327544dde82.pdf> (Accessed 05/25/2020). (In Russ.)

Received on 02/11/2020

Accepted on 03/16/2020