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Delivery of First Aid to Victims in Road Transportation Accidents

A.V. Baranov^{1, 2}

Central Research Laboratory

¹ Northern State Medical University

51 Troitsky Proezd, Arkhangelsk 163000, Russian Federation

² Cherepovets State University

5 Lunacharsky ave., Vologda Region, Cherepovets 162612, Russian Federation

* **Contacts:** Aleksandr V. Baranov, Candidate of Medical Sciences, Traumatologist-orthopedist, Researcher at the Central Research Laboratory of Northern State Medical University, Leading Researcher at Cherepovets State University. Email: baranov.av1985@mail.ru

RELEVANCE Most of the victims of road accidents die prior to the arrival of medical staff, therefore, providing first aid to injured people in the first minutes after receiving injuries is very important for saving human life and health. Timely and skillful provision of first aid to victims of road accidents prevents further deterioration of the state of the human body and can positively affect the entire process of its further treatment and rehabilitation.

AIM OF STUDY To characterize the delivery of first aid to victims of road traffic accidents at the present stage and to outline possible ways for its improvement.

MATERIAL AND METHODS To achieve this goal, an analysis was made of the results of domestic and foreign scientific research and regulatory legal acts on the issue of providing first aid to victims of road accidents. The literature search was carried out in specialized scientific search engines eLibrary, PubMed, Scopus using the keywords: first aid, prehospital stage, road traffic injuries, road traffic accidents. For the analysis, scientific articles published between 1980 and 2020 were selected. Resources with outdated or inaccurate information were excluded, some scientific papers were found by links to articles. The state of the problem of providing first aid to victims of road traffic injuries, for the most part, reflects scientific publications over the past ten years.

Keywords: first aid, road traffic accident, road traffic injuries, prehospital stage

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Affiliations

Aleksandr V. Baranov	Candidate of Medical Sciences, Researcher at the Central Scientific and Research Laboratory of Northern State Medical University, Leading Researcher, Cherepovets State University; http://orcid.org/0000-0002-3543-1738 , baranov.av1985@mail.ru
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AB - ambulance brigade

STSI - state traffic safety inspection

RTA - road traffic accident

MIA - Ministry of Internal Affairs of Russia

MES - Ministry of Emergency Situations

AS - Ambulance station

ES - Emergency situation

In the modern world, road traffic injuries are the most pressing medical and social problem of our time, which annually takes thousands of lives, and leaves millions of people disabled. A huge number of road traffic accidents (RTA) gives reason to declare a global epidemic with the most severe medical, social and economic consequences of our time. The need and timeliness of the study, as well as the search for an acceptable solution to this problem, does not raise doubts in the world expert community, as among practitioners – orthopedic traumatologists, surgeons, anesthesiologists-resuscitators, emergency and disaster medicine doctors, as well as healthcare organizers of all levels. [1, 2].

Prior to the arrival of emergency medical personnel or disaster medicine services, first aid to victims of life-threatening and health-threatening conditions should be provided by any eyewitnesses of this disaster [3–6]. Many researchers rightly believe that the most important role in the survival of victims of road traffic injuries is played primarily by the immediate and competent provision of first aid to the injured at the site of injury, as well as its timeliness and effectiveness [7, 8].

The vast majority of all road traffic victims sustained potentially non-fatal injuries, but even a slight delay in providing first aid at the scene of the accident can lead to cardiac and respiratory arrest, as well as contribute to the development of traumatic or hemorrhagic shock, which, ultimately, very quickly leads to death, which in a fairly large percentage of cases could have been avoided with timely and competent first aid to victims of an accident on the road [9].

The well-known rule of the "golden hour" indicates that if first aid is not provided to victims with life-threatening injuries within one hour, then the lethality increases dramatically; if assistance is provided within the first 20 minutes, then about 15% of the victims survive, and within the first 10 minutes – 90% [10].

Providing first aid to victims of road accidents is of particular importance in case of apparent clinical death, severe circulatory and respiratory disorders, ongoing bleeding, burns and other conditions, while failure to comply with it or delay can quickly lead to a significant deterioration in the victim's condition up to death [11].

Today, everyone should be ready to provide first aid to the victim in any emergency situation (ES), since it is generally accepted that the first contact with an injured person in critical condition, as well as timely provision of first aid at the scene of a disaster, reduce the likelihood of complications and determine the whole process of further treatment [12].

Eyewitnesses of an accident with medical consequences should transmit information about what happened to the medical and road services of the region by telephone, if possible, warn other road users about the accident, try to prevent possible panic and spontaneous actions of others, help extinguish a fire if there is one and, of course, immediately begin to provide first aid to the injured person before the arrival of medical specialists from the ambulance or disaster medicine teams of the region [13, 14].

In our country, in accordance with Part 1 of item 31 of the Federal Law of November 21, 2011 No. 323-FZ "On the Basics of Health Protection of Citizens in the Russian Federation" [15] first aid before the arrival of an ambulance is provided to citizens in case of accidents, injuries, poisonings and other conditions and diseases that threaten them life and health, by persons obliged to provide first aid in accordance with federal law or with special law and who have appropriate training, including employees of the internal affairs bodies of the Russian Federation, employees, military personnel and employees of the State Fire Service, rescuers of emergency rescue teams and emergency - rescue services. However, in accordance with Part 4 of item 31 of this legislative act "vehicle drivers and other persons have the right to provide first aid if they have appropriate training and / or skills». Consequently, today there is an urgent need for the widespread education of citizens in the techniques and methods of providing first aid to victims at the scene of the disaster. Such training is relevant, first of all, for drivers of any vehicles, employees of law enforcement agencies, personnel of the Ministry of Internal Affairs and the Ministry of Emergency Situations, as well as personnel of road transport and rescue services [16].

Providing first aid to victims is recognized as the most important and integral part of the system for providing assistance to victims in any emergency. There are various structural models for organizing prehospital care, depending on the nature of the local conditions, climatic, geographic and social characteristics, as well as the available medical resources in the region. Of particular importance is the quality and timeliness of providing first aid to injured persons in an accident, since 25% of those injured in an accident and those who died before the arrival of an ambulance could survive in the event of timely application of urgent measures within the framework of first aid. The main reason for not realizing the opportunities already provided for by legislation to provide first aid by persons with appropriate training is the fear of responsibility for causing harm in the course of its provision. To protect first aid providers, it is proposed to legislate the rule on the impossibility of bringing them to administrative or criminal liability for unintentionally causing harm to the victim [17–20].

In many regions of Russia, ambulance stations have a dispatch service as an element of a comprehensive system of medical support for victims of road accidents and other emergencies. In the presence of special training, the dispatcher on duty and the senior doctor of the shift can give detailed recommendations to eyewitnesses of an accident on providing first aid to the existing victims who are at the scene of the accident, before the arrival of the ambulance brigade. Consequently, there is a need for special training of personnel on duty dispatching services of the Ambulance Station (AS) on the implementation of unified algorithms for receiving calls about an accident and the development of a "list of prompts for action" of the dispatcher (senior doctor) of the AS for eyewitnesses of an accident who are at the scene of the disaster and who are capable to act adequately in relation to the victims before the arrival of the emergency medical team. Accordingly, in the event of an accident with medical consequences, eyewitnesses can call emergency numbers and ask for guidance on providing first aid to existing victims; so, in case of a sudden cessation of blood circulation and breathing, an ambulance dispatcher must give clear and comprehensive commands for cardiopulmonary resuscitation, however, in order to effectively support eyewitnesses, an ambulance dispatcher must himself undergo training in cardiopulmonary resuscitation of victims [21].

Currently, there are proposals for dividing first aid into two types: basic aid, which all citizens who have the necessary skills to provide it will still have the right to provide, and extended aid – provided by persons who have undergone special training, and for whom there is a duty to provide it to the victims. Such persons should include military personnel, rescuers, flight attendants, security guards and some others [22].

In the countries of the European Union, despite a fairly efficiently functioning ambulance system, great attention is paid by the authorities to the quality of training for drivers of vehicles, methods and rules of first aid in case of emergencies of various kinds, requiring its immediate provision. In the Netherlands and Belgium, all segments of the population are required to learn the rules of providing first aid to victims of emergencies in all educational institutions with a mandatory examination of the students. In Germany, a fairly long course of study is included in the driver training program in driving schools and is strictly checked by experienced medical specialists. In Canada and the United States of America, the training program for the population in providing first aid to victims of various emergencies is designed for at least 200 academic hours with practical training on dummies and a mandatory exam, which is taken by experienced paramedics. Currently, in the Russian Federation, driver training includes a 24-hour course of training in the rules of first aid in emergency situations on the road, but in the overwhelming majority of driving schools this training is carried out formally or is not carried out at all, and even more so there is no serious quality control of the received knowledge and assimilation of practical skills on the part of the professional medical community. The toughening of the final exam for cadets of driving schools for practicing the acquired practical skills and methods of providing first aid to victims of emergencies of various nature on specialized dummies, taken by professionals with medical education, could reverse and improve the current situation with the quality of driver training, and would also stimulate the latter to pay more attention to this issue [23, 24].

One of the most significant participants in providing first aid to victims of emergencies on the road should be employees of the Ministry of Emergency Situations (MES), the State Traffic Safety Inspectorate (STSI) and other law enforcement and special services and departments, who are usually the first to arrive at the scene of the disaster, however at present, they generally do not even possess the necessary knowledge and skills to provide first aid to those injured in emergencies and in the overwhelming majority of cases are not able to provide first aid to victims at a sufficient level until the arrival of medical specialists [25].

First aid training for employees of the Ministry of Internal Affairs (MIA) and EMERCOM of Russia in departmental educational institutions is designed for a small number of training hours, often without practicing the practical part, while the methodological base for training these institutions

is rather weak, and there are often cases of absence of teachers with necessary medical education. Consequently, it is necessary to improve the training of the traffic police, the Ministry of Emergency Situations, personnel of rescue teams and all other departments involved in road accidents, the rules and methods of providing first aid in sufficient volume with an emphasis on practical skills, with mandatory training in field all-weather conditions at annual exercises and collections held under the auspices of the Territorial Disaster Medicine Centers of the Russian Regions. On the basis of the Territorial Disaster Medicine Centers of many constituent entities of the Russian Federation, training centers have been created to train citizens in the rules of techniques and methods of providing first aid to victims of various types of emergencies. These centers should teach the provision of first aid to employees of the Ministry of Emergency Situations and the Ministry of Internal Affairs, rescuers, employees of private security companies, firefighters and other categories of citizens, as well as be the ideological and methodological basis of this type of training in a constituent entity of Russia. Therefore, these centers should train medical teachers, develop and publish methodological literature on first aid in various emergencies and monitor the quality of this training. The main emphasis should be on the development of the most simple and effective methods of providing first aid to victims in various emergencies, including road accidents, taking into account the climatic, geographic and social characteristics of a particular subject of the country [26–28].

Currently, an increase in the number of road traffic accidents, an increase in the absolute number of victims, including those with severe multiple and concomitant trauma, require both the improvement and optimization of the existing forms and methods of providing first aid to victims, and the development of new models. The main goal of such an integrated approach to first aid and treatment of road accident victims is to reduce the frequency of deaths at the prehospital stage [29]. Taking into account that the prehospital stage of rendering assistance is fundamental in the survival of victims of road accidents, for the implementation of the above goal, directions have been determined, the implementation of which, in our opinion, will allow preserving human potential. The main of these areas, in our opinion, are:

- increasing the professional competence of persons (employees of the Ministry of Emergency Situations, the Ministry of Internal Affairs, road services, etc.) providing first aid to victims of road accidents, through their mandatory cyclical training in the Territorial centers of disaster medicine of the constituent entities of Russia;

- tightening of the final exam for candidates for drivers of all driving schools with the obligatory admission of it by medical specialists with extensive practical experience;

- Expansion of practical training of dispatcher services personnel of territorial disaster medicine centers, ambulance stations and leading state medical institutions of municipal and regional level in obtaining information about road accidents and other emergencies, its rapid analytical assessment and leadership of eyewitnesses of road accidents to provide first aid to injured persons.

These proposals, in our opinion, today are the most relevant ways to improve the system of first aid to victims of road accidents, the implementation of which will reduce mortality and disability among victims of road accidents, as well as increase the efficiency and quality of its provision.

CONCLUSION

The analysis of domestic and foreign literature sources showed that the problem of providing first aid to victims of road traffic accidents is very relevant today, since it turns out to be only a small number of injured people, while there is no significant increase in the number of students in the techniques and methods of its provision, and also the adopted policy of promoting and popularizing its study among the population of Russia.

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