

## PREPAREDNESS OF THE CZECH HEALTH CARE SYSTEM AND CRISIS MANAGEMENT FOR CIVIL EMERGENCIES

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### Abstract

*The current state of the preparedness of the global Czech health system in case of civil emergencies, especially those risen due to the contamination caused by chemical, biological, radiological or nuclear weapons, toxic chemicals, radioactive substances, biological agents and toxins or highly infectious agents is inadequate. Such inadequacy threatens the inhabitants of the Czech Republic as they are exposed to serious dangers. The lack of proper procedures in case of an emergency is the result of many factors, ranging from inadequate undergraduate training of doctors and medical workers to minimal economic, legislative and organizational arrangements of the state, and further to the underestimation of the potential danger for the population. It is therefore necessary, regardless financial means, to take urgent action to remedy this both in terms of material and organizational ways, as well as educational and informative, including relevant courses and practical training.*

### Key words

*CBRN factors, threat to population, disaster medicine.*

### Introduction

Each medical staff should be able to understand the term Disaster Medicine. Many people, however, connect it with urgent /emergency/ medicine, but the Disaster Medicine branch has to cope with a number of other challenges than the health care administered to the patient only. The reason is obvious. A medical student, as well as a student of any kind of a medicine field (except Emergency Medical Service personnel), will not ever meet the Disaster Medicine

branch. Some of the medicine and medical faculties offer the Disaster Medicine issue only as a facultative subject, at other faculties this issue has been completely neglected.

### **Current situation in the Disaster Medicine branch**

The Disaster Medicine issue in the health care system has become urgent faster than we would like. In the 21<sup>st</sup> century we have witnessed a growing number of disasters.

They can be divided into the following three groups [1]:

- natural and civilization disasters [8, 16];
- disasters resulting from terrorist attacks [5];
- "break down" disasters [6].

Let us remind some events of 2011. The natural disaster in Tohok (Japan) on March 11, caused by an earthquake with the magnitude of 9 degrees of the Richter scale, and consequently a 38 metres high tsunami wave caused an accident of 6 - 7 degrees according to the International Nuclear and Radiological Event Scale in the Fukusima nuclear power plant. Or a terrorist attack in the Minsk subway, station "Oktjabrskaja" on April 11. Let us remember also the murderous attack of Anders Behring Breivik on the Norwegian island Utoya on Friday, July 22. As it is not possible to eliminate the risk of a terrorist attack, we can not exclude the danger of a chemical incident. An example is the explosion in the AZF Toulouse chemical plant, France, on September 21, 2001, which caused the death to 30 people and hurt another 2.442 people, or an explosion during manufacturing and manipulation with the munition in Slovakia (Military Repair Service in the Novaky town, on March 2, 2007, where 8 people died and other 41 employees were injured).

Currently, 58 ways of the danger for population are defined (divided into 5 groups). We would like to draw attention to those, which threaten us in reality everyday - the traffic accidents. As a consequence of these accidents a significant number of people can be affected, particularly in the road, rail and air traffic. Witnesses can remember the most serious railway accident in the Czech territory in Steblova on November 14, 1960, where 118 passengers died and other 110 were injured. One of the last heavy railway accidents happened on April 25, 2005 in Amagasaki (Japan), where 107 people died and 549 were injured. A significantly higher number of casualties occurs during plane crashes, when usually all passengers including a crew die, and other death losses can occur on the ground at the accident site. Not every accident must lead to casualties, but nevertheless it brings a number of complications for paramedics. Let us remember the mass car accident on D1 highway on March 20, 2008, where more than 100 cars crashed and about 20.000 people were affected (not only those in the crashed vehicles, but also others, who got stuck in the paralysed highway).

In the introduction, we mentioned already that a percentage of the medical society does not distinguish between the terms urgent /emergency/ medicine and disaster medicine [1, 3, 6, 20].

Urgent /Emergency/ Medicine is an interdisciplinary branch, which deals with situations immediately endangering life or leads to heavy and irreversible health damage.

Disaster Medicine is an interdisciplinary branch, which applies knowledge gained from emergency situations with the aim to rescue as many people as possible.

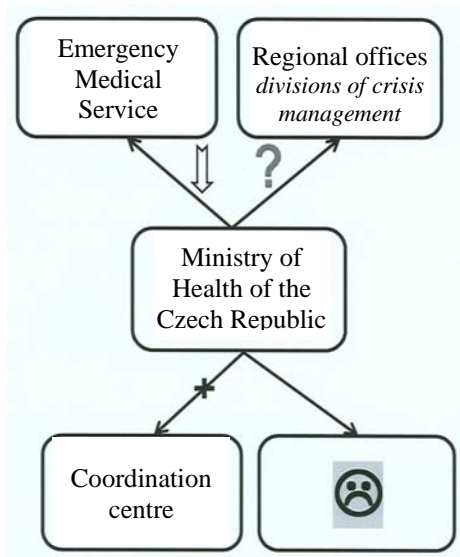
### **Current situation of the health care preparedness in the Czech Republic**

The analysis and identification of the weaknesses of the health care system was made in the document "Concept of Crisis Preparedness of the Czech Medical Service", elaborated by Crisis Preparedness Division of the Ministry of Health of the Czech Republic (MH CR) in March 2007 [18]. The authors of the document consider the absence of the application of the national security strategy into the health care system, in other words the absence of the establishment of the effective health-security subsystem as a part of the global national security system and its consequent enforcement into the national security policy [19] as the weakness number 1.

Despite the fact, that this material was elaborated four years ago, a lot of shortnesses have still persisted. The key areas, which require prompt solution, are particularly [9, 10, 11, 12, 13] (scheme 1):

- a) unsolved coordination between the MH CR and divisions (departments) of crisis management of particular regional offices;
- b) present minimal influence of MH CR on the establishment of functional Emergency Medical Service (EMS); the MH CR is not able to directly establish, organize or ensure the operation of EMS. While the other basic components of the Integrated Rescue System are managed centrally (the General Directorate of Fire and Rescue Service of the Czech Republic or the Police Presidium of the Czech Republic), the MH CR misses such coordination element;
- c) the absence of the operation management position and a contact point in particular inpatient medical facilities (a number of smaller medical facilities have got no crisis management department implemented into their organizational structure with a unified guideline, generally these departments are usually missing or their job is substituted by other units);
- d) insufficient equipment of the EMS and inpatient medical facilities of regional competences with the decontamination, barrier, and other tools and means to solve specific threats, i.e. chemical, biological, radiological and nuclear (CBRN);

- e) insufficient provision of necessary knowledge and training of specific procedures in situations when health service is administered in emergency situations by first aid providers;
- f) traumatology plans of health centers are mostly obsolete, they are not, in case of new owners updated, they do not respond to new type plans, they miss also potential temporary solutions in case of the necessity to improvise;
- g) health care needs in the area of civil security have been under-financed for a long time, and since health facilities are mostly financed through health insurance companies, at the present time there is no anticipation to improve the situation;
- h) shortage of special material technology basis, logistics and funds;
- i) unsatisfactory theoretical elaboration of the above mentioned shortages and at the same time the absence of particular steps in order to improve this situation.



- ⊗ insufficient equipment of emergency medical services and health facilities with aids and medicines in case of CBRN threats;
- ⊗ obsolete traumatology plans of health facilities;
- ⊗ insufficient professional preparation of providers of the first aid in case of the exposition of population to CBRN factors.

*Scheme 1*  
*Preparedness of the Czech health care system in case of a CBRN threat to population*

As long as we take a think over above mentioned facts and combine them mutually we realize that the absence of a long-term and focused conception of a security system is common for all of them. The causes why this happened are a lot, the key ones are:

- a) the Health Care Department has undergone since 1989 much larger organizational, economic, property and conceptual changes than it occurred in the ministry of interior department under which the remaining basic sections of integrated rescue system are included;
- b) the Disaster Medicine issue is the interdisciplinary one and requires specialists also from non-medical professions [15];
- c) this issue is connected, within some professional public, with the issue of the military health care [4, 21];
- d) public media, instead of assisting in the preparation of population and get them familiar with the challenges of the disaster medicine branch together with the way of acting and behavior during extraordinary events, often depreciate it [7];
- e) health facilities and considerably also Emergency Medical services are financed from funds of health insurance companies, therefore for medical services. As long as a medical facility makes some financial reserves, it spends them first of all on the reconstruction of the facility or on the improvement of a diagnostic and therapeutic process, not on the needs of the Disaster Medicine, though. Most, this way spent funds would be due to the development of the organization itself in loss. Medical aids and mostly also medicines are after the expiration period disposed, because their usability is in a current practice minimal (e.g. anti-dots, radiation protectives), or they become obsolete morally (in case of various devices) [14, 16];
- f) modern economy requires flexible supplying and the decrease of useless stocks. Health facilities store medicines, medical materials, and disinfection means calculated pursuant to current operations with particular reserves. In case of an extraordinary event there is a sudden need of larger number of these means in the course of the first 4 hours and further till 24 hours. A number of suppliers is not capable to supply hospital pharmacies in such a short time (especially during the weekends and at night) and as long as their stocks run out, the organizational complications will occur;
- g) traumatology plans of health facilities are, especially in private organizations, obsolete ( in reality we found the plan of 1956 and it was approved), many times they do not address the fact that elementary changes of a professional polarization in a specific facility were carried out, further personnel and location changes as well. The personnel have not been systematically prepared to respond to crisis situations either professionally or organizationally. Random, beforehand planned exercises as long as they are ever carried out, do not solve the situation as they are generally prepared in details in advance, but at the moment when the crisis situation really occurs, it proves that the personnel are not able to respond adequately [1, 2, 3, 17, 20].

Here it is important to emphasize that this does not concern the Emergency Medical Service;

- h) we can see insufficient knowledge of doctors and other medical personnel of ward facilities how to proceed in case when they have to deal with a person who was contaminated through the application of chemical, biological, toxic, radiological or nuclear substances, radioactive materials, biological agents and toxins or other highly infectious substances [8, 11, 12, 13, 17]. Most of the doctors are familiar with the Central toxicology laboratory and Toxicological information center at General faculty hospital providing non-stop telephonic consultation services. They would surely find the contact to infectious clinic of Faculty hospital Bulovka but we deem that the problem for them would be a person contaminated by a radioactive substance. Questions that we receive from medical public in case of incidents resulting in the leakage of atomic irradiation reassure us in this reality. A recent example of such incident has been the nuclear power-plant Fukushima.

As mentioned in the introduction, we cannot time out with the solution of a given situation and pretend, in the representatives of health department capacity, that the problem does not exist. We are not able to imagine what would occur as long as there was a large-scale accident in the Czech Republic and the necessity to provide imminent health care connected with the treatment of the contaminated persons by any of CBRN substances which means the provision of urgent traumatology care.

We are persuaded that Emergency Medical Service is able to manage even a large-scale breakdown with a large number of the injured with mechanical injuries also thanks to inter-regional assistance which is based on personal contacts of the management of particular regional directorates, since there is at present no coordination body with the nation-wide competence in the framework of the Ministry of Health. However, the situation would become unsolvable as long as the population was threatened by some of the above mentioned substances. It does not have to be any targeted attack against civilians. It could be just an explosion or an uncontrolled leakage of toxic chemicals in some of industrial plants and we will need a large number of mobile breathing apparatuses. According to our contemporary findings we can say that a total failure of most health facilities would occur also in case of a large number of contaminated persons by some of CBRN substances who would need urgent decontamination [2, 14].

### **Organizational security of Emergency Medical Service and Disaster Medicine**

Current legal amendment set by the Act No. 240/2000 Coll. is not appropriate for Emergency Medical Service since it does not reflect organizational, technology and professional development in the field of pre-hospital urgent care and the following urgent care. In this amendment we cannot find properly defined tasks of Emergency Medical Service, also the adaptation of the rights and

obligations of medical personnel is not sufficient with regard to specific conditions in which they perform their profession. Also the adjustment of the cooperation of health facilities providing inpatient urgent care in case of the patients transfer from Emergency Medical Service is missing. Another insufficiency in the current legal amendment is the absence of the adaptation of conditions of Emergency Medical Service performance during the fulfillment of tasks set for Emergency Medical Service in the framework of crisis management and Integrated Rescue System [22, 24]. The position of the Disaster Medicine branch is completely omitted.

It took more than 10 years since the Act 240/2000 Coll. had passed [23, 24], and the government of the Czech Republic submitted to the Parliament the draft bill on Emergency Medical Service (in the first reading 2011-07-12) [22]. Until in this draft we can see the enactment which sets duties for providers of urgent inpatient care in connection with Emergency Medical service. The idea is to make conditions for mutual cooperation and concurrence of providers of Emergency Medical Service with providers of urgent inpatient care in the way which avoids prospective problems (most frequently it was the refusal to transfer the patient and Emergency Medical Service was just a humble prayer.

This act arranges elementary liabilities of providers of urgent inpatient care which is necessary for concurrence of medical services and principles of cooperation with the providers of Emergency Medical Service. Besides others it sets the liability to establish a contact point, specifies specialized workplaces that in a non-stop process have to ensure imminent concurrence of medical services with Emergency Medical Service by providing urgent inpatient care.

The adoption of the above drafted bill will initiate for medical facilities a range of other tasks and therefore the doubts appear whether they will be capable to fulfill them.

### **Necessary measures in the framework of the Disaster Medicine branch**

It would be a mistake to emphasize in this paper just the insufficiency and not to attempt to look for prospective solutions and ways of their realization.

Indispensable steps are in the implementation of the following measures:

- a) acceleration of an overall analysis procedure of a current situation in the preparedness of medical facilities and procedures for solutions in crisis situations during which, besides others, the contamination by CBRN substances might occur (on the level of Emergency Medical Service, district hospitals and hospitals with region-wide competence including the faculty ones);
- b) the analysis of valid CR legislation in this field and elaboration of the groundwork in order to concur with relevant international requirements, especially with new relevant guidelines of the European Union and recommendations from International Atomic Energy Agency;

- c) the analysis and the comparison of findings with similar plans of selected countries of the European Union and some other states;
- d) the assessment of the critical infrastructure cohesion of particular regions with traumatology plans of medical facilities;
- e) the evaluation of traumatology plans of medical facilities. Their participation in the solution of crisis situations is indispensable;
- f) the evaluation of the level of the knowledge and skills of medicine and medical personnel related to diagnostics, methodology of patients nursing and treating in case of the contamination by CBRN substances in mass accidents and taking steps for personal safety and protection of patients in this field;
- g) the evaluation of the functionality of providing medical facilities for sufficient and rapid supplies of medicines, medical materials and necessary protective means;
- h) accelerated preparation and organization of regional seminars and courses aimed at instructing the workers responsible in particular medical facilities for the elaboration of traumatology plans in order to achieve their prompt updating in relevant organizations;
- i) arranging seminars and other activities focused on practical training for doctors, medical personnel for the treatment of patients contaminated by CBRN substances;
- j) the analysis and application of the experience acquired during the setting of crisis units and specialists of Fire and Rescue service of the CR, the Army of the CR and volunteer organizations in the radiant of disasters abroad;
- k) higher professional and organizational cohesion of this issue within the framework of the Integrated Rescue System of the CR, especially the application of existing institutions and facilities which are on a high professional and operational level (Field hospital of the CR Army, Center of biological defense of the CR Army Techotin, Joint Chemical, Biological, Radiological and Nuclear Defense Center of Excellence NATO in Vyskov and many others);
- l) the pressure on the heads of medical faculties and faculties educating graduates focused on medicine to implement theoretical education and practical training in the assigned field into study fields and programs as obligatory objects;
- m) the elaboration and publication of professional works and monographs aimed at the mentioned issue;
- n) the acceleration of the elaboration of a media policy outline and the groundwork for making the public acquainted with the principles of population protection which will be accepted and implemented first of all by public media;
- o) the organization of model exercises aimed at verifying the functionality of innovated traumatology plans and the cohesion of crucial medical facilities with Emergency Medical Service. It is important to keep the preparation of



these exercises secret in order to verify the actual conditions and not in advanced trained scenarios.

## Conclusion

The tasks set on the Disaster Medicine branch are characterized by their complexity. They cannot be solved though, without relevant legislative and economic support. The important role belongs also to the pre-gradual and post-gradual education of medicine and medical public and the informing and schooling of citizens through public media, as well as repeated trainings how to solve crisis situations.

## Résumé

*The issue of the Disaster Medicine in the health sector with regard to the high danger of incidents and regarding the extent of the impact of the disasters that have occurred in recent years, becomes more vital.*

*The Disaster Medicine is an interdisciplinary field that applies lessons learned from emergency situations in order to rescue as many people as possible. A percentage of the medical public, however, do not separate the concept of Disaster Medicine and Emergency Medicine which is an interdisciplinary field addressing immediately the life-threatening situations or severe health damage.*

*“Crisis Preparedness of the Health Care System of the Czech Republic” introduces the analysis and the identification of the weaknesses in the current health care system. The most serious deficiency seems to be the absence of effective medical and security subsystems within the comprehensive national security system, and the subsequent enforcement by the national security policy.*

*The key issue that requires to be solved promptly is the elementary coordination between the Ministry of Health of the Czech Republic and the regional offices, and their influence on the establishment of a functional medical rescue system. Disaster Medicine provision and consequent inpatient health care cannot do without special protective equipment, facilities for decontamination and resources to tackle specific threats of chemical, biological, radiological, and nuclear (CBRN) hazards. The requirements for the health care of this kind have been underfinanced for a long time and have caused the generation of a gap regarding technology and logistics. Traumatology plans of medical facilities are in many cases obsolete instead of being updated for new owners, or they are even missing.*

*We should speed up the solution process to improve this situation. At present, emergency medical services are capable to manage large-scale disasters with a large number of injured people applying the interregional assistance. However, the situation would be unmanageable if there was a disaster involving any CBRN substances. We may assume that most medical facilities would fail in*

case of the increased number of the contaminated persons by any of CBRN substances which would require necessary urgent and professional health care.

The solution is the acceleration of the implementation of a comprehensive analysis of the current state of health facilities preparedness and procedures in crisis situations in case of the contamination by CBRN agents, including the analysis of current legislation of the CR in this area and in the processing of documents for the harmonization with the international requirements, especially with new relevant EU directives and recommendations of the International Atomic Energy Agency. Further it is necessary to assess the consistency of critical infrastructure of regional trauma plans with health care facilities. The attention must be paid to the level of knowledge and skills of medical and nursing staff regarding the diagnosis, treatment methods and treatment of patients contaminated by CBRN agents in case of mass accidents and ensure personal safety and protection of patients. In this area, it is also necessary to organize the adequate number of seminars and educational events including the provision of the necessary literature, to focus on theoretical and practical training for doctors and medical staff when treating patients contaminated by CBRN agents. The quality of undergraduate medical training of students at medical faculties should not be underestimated. Also the concept of media policy regarding the familiarization of the public with the principles of the behavior of citizens in above mentioned cases is highly important.

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