

ASSESSMENT OF CRISIS READINESS TO MOVE A PATIENT FROM THE AIRPORT WITH SUSPECTED EBOLA

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Review article

Abstract: The aim of this article is to verify the readiness of patient transport from the airport with symptoms for Ebola disease by the rescue services of the Integrated Rescue System of the Czech Republic. Detection of possible risks and causes of risks during patient transport. In one part of the article, the part is devoted to the current legislation regulating the cooperation of IRS, economic measures for crisis situations, functions of state material reserves management, material security of selected IRS components and the work of BIOHAZARD TEAM. The main part of the article describes the course of the extraordinary event. There is a chapter devoted to the analysis and evaluation of risks during transport. It also deals with the issues of transport, risks and problems that may be encountered by the intervening members of the IRS units. In conclusion, the proposed measures to help minimize risks in the transport of infected patients.

Keywords: Integrated rescue system, emergency, Ebola, HOPKS, BIOHAZARD TEAM.

Introduction

In the preparation of this article, a strong emphasis was placed on the current equipment of one IRS component and recommendations to improve its emergency response equipment. There are a number of tasks within the Integrated Rescue System of the Czech Republic and selected units such as the Fire Rescue Service of the Czech Republic, the Emergency Medical Service of the Czech Republic and the Police of the Czech Republic fulfill specific tasks here. An important factor is the deployment of intervening personnel and means available to each unit, as well as the deployment of technology and material for securing the necessary work to help the activities of the Integrated Rescue System of the Czech Republic. The main part describes the extraordinary event and the intervention of BIOHAZARD TEAM. A practical example is given here and evaluated the transport of a patient suspected of being infected with EBOLA virus in the Czech Republic. The aim of the article is to find out, describe and explain the method of material security of the selected component of the Integrated Rescue System of the Czech Republic in providing activities for the benefit of the entire IRS. Furthermore, to point out the various areas of logistics security, resources and propose options to improve or eliminate problems.

Principle of the integrated rescue system

Integrated rescue systém (hereinafter referred to as IRS) is not an institution, office, ward, association or legal entity. The IRS is indeed a system of working with cooperation tools and model procedures of cooperation (type activities) and is part of the system for ensuring the internal security of the state. It is a system of contractual arrangements according to regulations set by the rules. An exception and a certain institution of the IRS became operational and information centers since 2004, which are organized in a dispatching way, and state-of-the-art technology for receiving and distributing emergency calls to the single European emergency number 112. These centers have their employees and technical equipment and are a relatively autonomous part of the Regional Fire Rescue Corps (according to the "Regional Fire Rescue Service"), which provide them with personnel and material support. Integrated Rescue System (IRS) is an effective system of links, rules of cooperation and coordination of rescue and security services, state and local authorities, physical and legal entities in the joint execution of rescue and liquidation work and in preparation for emergencies. So to put it briefly, "no one has been left out who can help and none of them interfered with each other. (Vlasim, 2011)

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Terminology used in IRS

In this chapter I will deal with individual terminologies that are used in relation to the integrated rescue system in the Czech Republic.

Extraordinary event

The IRS deals with the coordination of rescue and liquidation work in emergencies, which is a harmful effect of forces and phenomena caused by human activities, natural influences, as well as accidents that endanger life, health, property or the environment and require rescue and liquidation work. This definition also gives the scope of the IRS Act to some extent, as not every event for extraordinary reasons meets the conditions of that definition. Example of a two-car accident: according to the IRS Act, this accident is an extraordinary event if an accident caused injury to a person so serious that emergency medical services had to be called, or firefighters had to come to rescue people. If “only” the car was completely devastated but there was no personal injury or danger to others or other causes that would require rescue and liquidation work, this accident is not an extraordinary event within the meaning of the IRS Act. For the sake of clarity, it should be added that police investigations into the causes of such an accident are not considered rescue or liquidation work. (Emergency, 2009)

Rescue work

Are activities to avert or reduce the immediate impact of risks arising from an emergency, in particular in relation to a threat to life, health, property or the environment, and to interrupt their causes. (Pevi, 2015)

Liquidation work

Are actions to eliminate the consequences of an emergency. The boundary between the two activities is sometimes difficult to discern, but it has its significance in terms of compensation in the case of so-called accidents. The difference in both definitions is the word “immediately”. Necessary rescue and liquidation work must always be carried out, and the liquidation can be “postponed” at the latest until the time priority rescue is completed. Again, an accident involving oil leaks, whether from an engine or a load, may be an example. The rescue work, which must be carried out immediately, is to recover the wounded from the wrecks or to extinguish the burning vehicle. It is also necessary to clear off-road wrecks and to clean

the road from oil before resuming operations, but only after rescue operations and they are liquidation work. (Pevi, 2015)

Coordination of IRS units in joint intervention

The management of emergency coordination is divided into several stages, which I will discuss in this chapter.

Organizational and operational management

Almost every organization uses a hierarchically structured power of decision making from the head of the organization to the ordinary worker or clerk in its internal operations. Such management is usually called organizational management and is expressed in the organizational rules of the organization or a similar management act. Rescue, military, security and other organizations also have organizational management, but at the same time they must provide extraordinary authority to manage while performing activities outside their own organization. Such management is called operational and the extraordinary powers acquired in operational management are often enshrined in legislation, as their use is thus also justified against natural and legal persons outside organizations. Almost every use of IRS is carried out within the framework of the operational proceedings and the legal regulations stipulate the authorization of the IRS operations centers, the authorization of the intervention commander, the mayor of the municipality with extended powers (hereinafter “ORP”). (Emergency, 2009)

Operational and information centers of IRS

Incorporation into IRS is difficult to implement without the basic IRS component having its own operating center, dispatching center or so-called permanent service, which are able to realize communication with the outside world. The operations centers of the basic IRS units are able to receive so-called emergency calls (150, 155, 158). For the purpose of mutual communication, the IRS Act provides for the function of coordinating operational and communication elements, which are operational and information centers of IRS (hereinafter referred to as “IRS DESCRIPTION”). The role of OPIS IRS is played by operational and information centers of regional fire brigades. These

are physically in all regional cities. In addition to the IRS DESCRIPTION, regional emergency call centers (TCTV) have been established in regional cities, primarily designed to receive emergency calls for the single European emergency call number. (Emergency, 2009)

Components of the Integrated Rescue System

The components of the integrated rescue system are divided into the main and the other.

Basic components of IRS:

- Fire Rescue Service of the Czech Republic,
- Fire protection units included in the area coverage of the region by fire protection units,
- emergency medical service providers,
- Police of the Czech Republic.

Other IRS components:

- Allocated forces and means of the armed forces,
- Municipal Police,
- Public health authorities,
- Emergency, emergency, professional and other services,
- Civil protection facilities,
- Non-profit organizations and citizens' associations that can be used for rescue and liquidation work.

Regional emergency plan, emergency plan

The Regional Crisis Plan is a summary planning document by which the crisis management authorities plan measures and procedures in case of resolution of a crisis situation within their material and territorial scope, which reached such a level that it is necessary to use extraordinary measures to solve it. It is processed, updated and verified outside the period of threat of KS by the relevant crisis management authorities to the extent based on their material competence. Particulars and method of processing are governed by Government Decree No. 462/2000 Coll., As amended by Government Decree No. 36/2003 Coll. and No. 431/2010 Coll. in §§ 15, 15b and 16. (Thesis, 2014)

The regional emergency plan is prepared by the regional fire brigade. The preparer of the crisis plan of the municipality with extended powers is also the regional fire brigade. Requirements are regulated by Government Decree No. 462/2000 Coll., As amended by Government Decree No. 36/2003 Coll. and Government Decree 431/2010 Coll. in Sections 15, 15c and 16.

The crisis preparedness plans are linked to the region's crisis plan. At the request of the crisis management authority, these are processed by legal or entrepreneurial natural persons and territorial administrative authorities, which ensure fulfillment of measures resulting from the crisis plan. Particulars and method of processing are governed by Government Decree No. 462/2000 Coll., As amended by Government Decree No. 36/2003 Coll. and Government Order No. 431/2010 Coll. in § 17 and 18. (Thesis, 2014)

Another type of plan is the Critical Infrastructure Preparedness Plan.

Emergency Plan - a special purpose document presenting a summary of measures to carry out rescue and liquidation work to avert or limit the immediate impact of an emergency resulting from an emergency and to remove the consequences caused by an emergency. (Health Cara, 2015)

County Emergency Plan - is prepared to deal with emergencies requiring a third or special level of alarm.

- It is processed by the Fire Rescue Service of the Region in at least 2 copies,
- one HP of the region is stored as part of the regional crisis plan for the meeting of the Regional Security Council and the Regional Crisis Staff, the other is stored at the operational and information center.

The Fire Rescue Service of the Region will hand over extracts from the Regional Emergency Plan to the units, administrative authorities and municipalities that carry out tasks from the Regional Emergency Plan for the elaboration of their activities in case of emergencies. (Emergency, 2009)

Emergency planning - a set of activities, procedures and linkages carried out by ministries and other central administrative authorities, regional and municipal authorities and the legal entities concerned or natural persons engaged in business planning of emergency and liquidation work in the event of an emergency, using existing forces; resources.

IRS alarm levels and their purpose

The level of alarm (three stages 1, 2, 3 and 4 special) predetermines the need for forces and means for rescue and liquidation work (depending on the extent and type of LA) at the site of intervention or in the area where several interventions take place. The required level of intervention is announced by the IRS DESCRIPTION upon the initial calling of the IRS units to the place of intervention or

it is announced and in particular specified by the commander of the intervention. The announcement of the third or special level of alarm allows the mayor ORP, respectively. Regional Governor, respectively. The Ministry of the Interior to take over the coordination of rescue and liquidation work under the conditions set by the IRS Act. (Emergency, 2009)

Tactical, operational and strategic level of management

Depending on who performs its own coordination of emergency services in the event of an emergency and liquidation works, there are three conceptual levels of management:

- tactical level of management at the municipal authority - coordinated by the commander of the intervention.

Strategic level of management at the municipal authority - coordinated by the Mayor of the MEP, the President of the Region or the Ministry of the Interior (MV-DG FRS CR).(Emergency, 2009)

Coordination of the intervention at the location of the intervention by the interviewer

The place of intervention is considered to be the area where the incident is manifested by its effects or where the occurrence of the incident is expected. Here, the rescue and liquidation work is the responsibility of the commander of the intervention, which is, unless a special law provides otherwise (eg in public order) firefighter - commander of the fire protection unit with the right of priority command under special legislation (Decree No. 247/2001 Coll.). The commander of the intervention may also be the commander of the SDH unit of the municipality, which the municipalities set up pursuant to the Act on Fire Protection (Act No. 133/1985 Coll.). The commander of the intervention manages the execution of rescue and liquidation work and coordinates the activities of the IRS units at the scene of the intervention. (Emergency, 2009)

Extraordinary event and transport of a patient ebola

Part of the article is focused on detecting and minimizing the risks of an intervening vehicle of the BIOHAZARD TEAM group. There is described

the incident of intervention of BIOHAZARD TEAM in the announcement of an emergency, transport of a patient suspected of being infected with Ebola from the airport to an infectious clinic. For the preparation of this part I use the knowledge and experience that I gained during the personal participation of the exercises at the Václav Havel Airport in Prague, several exercises of the BIOHAZARD TEAM intervention during the announcement of extraordinary events . (Fig. 1)

Chemical suits, BIOVAK transport or decontamination showers are the equipment for the intervening staff. It is an exercise designed to verify the preparedness and equipment of intervention personnel in the event of a dangerous Ebola infection in one patient. The main task is to verify the equipment of the emergency vehicle for the transport of the infected patient and the correct procedure of intervention in the decontamination of the affected persons. (Prague, 2015)



Fig. 1 Preparing the intervention unit, protective suits (source: own)

Course of extraordinary events

Employees of the Regional Hygiene Station, Health Institute, paramedics, police officers and city guards participated in a tactical exercise called Ebola 2014. The topic was suspicion from possible occurrence Emboly on board aircraft in order to ensure cooperation of all involved units with an emphasis on flawless implementation of anti-epidemic measures. The idea put the instructor in a situation where several MSF staff returned from the mission in Sierra Leone. While traveling by plane, one of the workers felt tired, muscular, and feverish. He confided to a fellow physician and he started an examination and set in motion a procedure for suspecting a patient who had come into contact with Ebola. (Blahova, 2016)

At 11.15 o'clock, at the Air Traffic Control of the Czech Republic, s. P., It was announced by the crew of the aircraft heading to Václav Havel Airport Prague with 33 passengers that there were passengers suspected of having VNN on board.

The Air Traffic Control unit announces to the operations center of the Václav Havel Airport Prague Fire Rescue Service that a person is present on board an aircraft with symptoms suggesting suspected Ebola VNN and the person is traveling from risk areas where he / she was working with Ebola patients. Based on the decision of the OOVZ authority (designated KHS Prague employee), predefined IRS components are activated to implement the relevant measures. The level of notification of the OPIS MC of the General Directorate of the Fire Rescue Service of the Czech Republic was trained only by staff. Immediately after announcing the event and evaluating the situation went to a reserved place for extraordinary events unit fire brigade of Václav Havel Airport Prague, which waited in advance for the aircraft landing. From the point of view of security, an airport security was sent to the designated point for entry of the units into the airport complex, which opened the gateways and accompanied the IRS units to the location of the event on the airport area. In order to ensure security at the airport, a special plan of measures was activated by the Police of the Czech Republic. city from its workplace. KZIS HZS JMK sent the fire brigade to the place of the fire brigade according to the set alarm plan for this type of event, which is based on units of the fire brigade station Prague, which has the whole predestination for these types of events. At the same time, the call-up of the biohazard members of the ZZS JMK team and their sending to the airport began. Given the seriousness of the situation, a meeting of the Crisis Staff of the Airport Security Committee at Václav Havel Airport Prague was also convened. (Blahova, 2016)

After landing and guiding the aircraft on the stand, a security closure around the aircraft was created by the airport firefighters and police officers. Communication took place through the control tower with the crew of the aircraft and forwarding information to the commander of the intervention of the fire brigade, who communicated with employees of HS hl. city of Prague and further evaluated the situation. After the arrival of fire brigade units the site was divided into three separate sections. (Blahova, 2016)

Workplace No. 1 began construction of a decontamination station for firefighters and health care professionals, where the bio-bag is simultaneously decontaminated with the patient.

Workplace No. 2 decontamination of high-risk persons who have been affected, for example, by discards from an infected patient or were sitting in seats in close proximity.

Workplace No. 3 is built on the airfield with a background from an emergency survival container and inflatable medical tents.

Given that it was a very complicated and extensive event, the commander of the intervention decided on the creation of the headquarters of the intervention commander and at the same time as an assistant to the commander of the intervention appointed a senior officer of the fire brigade. The crew consisted of representatives of all IRS units, and Václav Havel Airport Prague. At the first meeting, information on the situation so far was evaluated and the first on-board reports from the aircraft were refined. There were 33 passengers on board, one of whom had a high-risk VNN risk and was taken care of by a doctor and a total of three cabin crew members with two pilots outside the passenger compartment. According to the available information, five persons at risk were identified. There were also pregnant passengers on board, as well as persons without detailed information. (Blahova, 2016)

At the meeting, the following procedure for dealing with the intervention was agreed: "Two members of the biohazard team of the EMS JMK and one member of the HS hl. The cities of Prague will board the plane and sort out the passengers into three groups. Low-risk persons get out of the aircraft and disinfect the shoe and hand soles in front of the aircraft with the assistance of three fire-fighting personnel in protective equipment. After this disinfection, they will be loaded onto the airport shuttle, where they will be instructed by the HS hl. City of Prague about the situation. Here, they will be given an information leaflet and then transported to the airport hall for check-in. The next group will be high-risk persons who have been contaminated by or sat in close proximity to the patient. These will be decontaminated in SDO3 and transported by the rescue service to the Department of Infectious Diseases of the University Hospital Na Bulovce for observation. It will be necessary to summon additional ambulances for transport. The patient will be led out last and into the transport insulator - the bio-bag will be loaded on the area in front of the aircraft. After the session was closed preparedness was reported from the individual sections of the intervention, the final meeting of the intervening groups in the danger zone and a safety interview were held. Evacuation, Decontamination of Passengers and Airplanes: Passengers were led by groups, accompanied by members of the Police of the Czech Republic, first to the airport bus, then to SDO 3, where the real decontamination and handover for further treatment took place. In the end, the patient himself was evacuated with suspicion of VNN,

watered and loaded into a bio-bag. Subsequently, the patient was decontaminated and handed over to the second group of biohazard ZZS JMK team outside the danger zone. Here was loaded into an ambulance car and accompanied by the Police of the Czech Republic transported to a designated medical facility. During these rescue operations, at the next meeting of the commander of the intervention team, it was decided to handle the baggage, sort it into risky patient bag and other baggage. The airport and the Police of the Czech Republic took care of the further handover of luggage. Hazardous baggage was treated as infectious material. These activities were performed only by the fire brigade unit. Decontamination of aircraft compartments was not performed. The aircraft secured its operation against further entry until further cooperation measures were determined with the aircraft operator. In conclusion, firefighters decontaminated the danger one with back-mounted sprayers. (Blahova, 2016), (Fig. 2)

Course of exercises:

- 13:00 ANS notification,
- 13:21 summoning of the Biohazard team,

- 13:45 BH team 1 on site - waiting for the decontamination line to be set up,
- 14:38 boarding,
- 14:45 first information,
- 14:55 departure of unaffected passengers,
- 15:00 departure of 10 contaminated passengers,
- 15:07 patient information,
- 15:13 in bio-vacuum,
- 15:33 after decontamination, Team2 takes over,
- 15:41 transport,
- 15:46 medical part of the intervention ended.

Other focuses during exercise:

- Tested the usefulness of the Head of Medical Unit on the staff of the intervention commander,
- team workload - sorting, evacuation organization,
- problem with personal documents of contaminated passengers,
- acceleration of operation by shortened decontamination.

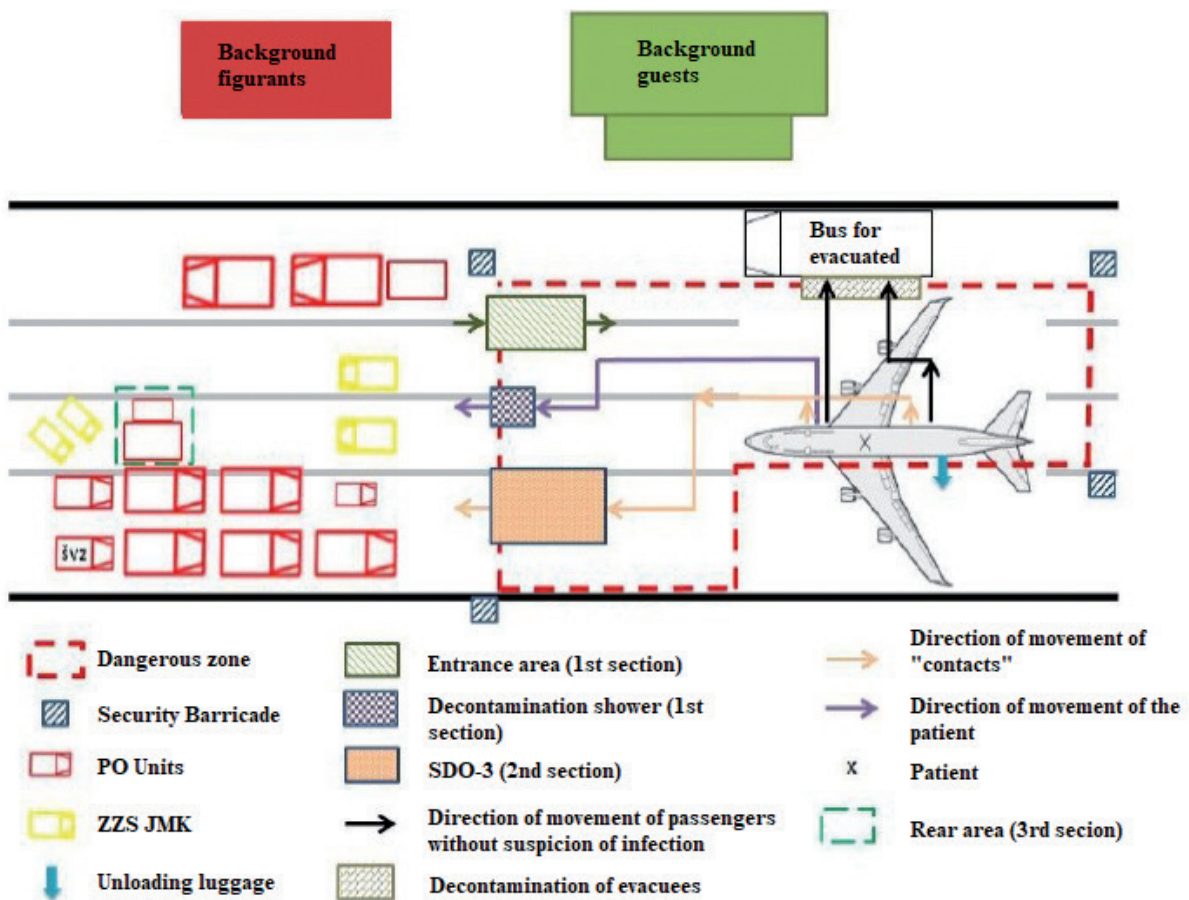


Fig. 2 Deployment of the IRS unit (source: own)



Fig. 3 Putting the patient in a stretcher
(Bullobe was preparing for Ebola, 2015)

Decontamination workplace, used means, recommendations for improvement

At present, inflatable decontamination showers are used for decontamination of persons, the advantage is simple transport, the disadvantage is the slow handling of affected persons. Decontamination inflatable showers inflate regularly and are checked for functionality. Movement inside the shower is impaired when decontaminating immobile persons and the patient must be carried at all times by the intervening person. Decontamination solutions are captured into stand-alone barrels and this quantity must be checked during the intervention and disposed of by separate collection after completion of decontamination. I would recommend using a decontamination container at all workplaces to replace the functional but already outdated inflatable decontamination showers. (Biohazard Team, 2011), (Fig. 3)

The decontamination container consists of a two-axle trailer with a hinged side door, under which the tent parts are placed, which are unfolded when the door is opened, thus creating working spaces for decontamination.

Reduced standby time is achieved by ensuring that all decontamination technology is permanently stored and does not require further handling. The trailer contains all decontamination modules:

- Dressing room,
- Wet process with showers,
- Dressing room, operator decontamination,
- Technological part.

The container also includes a wastewater sump after decontamination. In standby mode, only waste water collection tanks are located outside the trailer

area. Standby and operation requires a maximum of 1 + 5 people. (Biohazard Team, 2011), (Fig. 4)



Fig. 4 Preparation of fire brigade decontamination container (source: own)

Special protective equipment

Protective aids are called objects used to protect human health during various activities. Protective work aids are used as accessories to ensure OHS. However, they should not be confused with personal protective equipment. PPE comprising a wide range of devices protecting various parts of the body from the risks associated with the performance of a particular work activity. A handful of companies around the world producing protective equipment against Ebola are unable to keep up with the current crisis. Special suits occur not only in West Africa, but also in the USA. Protective suits, shoe covers, drapes or goggles to protect medical professionals from the body fluids through which Ebola spreads have become one of the symbols of the current epidemic. But only a few companies in the world produce them. (Biohazard Team, 2011)

Personal protective equipment - protective suit

Protective suit Microgart 2500+

Protective suit Microgart 2500+ is an antistatic overall of the highest protection class. The suit is made of a special composite material with polypropylene core, which gives the overall unique properties - excellent breathability, wearing comfort and extremely high durability. Protection against penetration of radioactive particles, infectious agents, against viruses, bacteria and blood pathogens. Zipper with protective flap, fully closed seams for improved protection. (Thesis, 2014)

The Biohazard team prepares itself for taking the patient on the plane and documentation from the epidemiologist present according to precisely defined procedures. The intervening unit must be dressed in special clothing with a filter-ventilation unit and proceed well during dressing in order to avoid contact with the patient or virus intrusion on the intervening staff. Transport stretchers are prepared for patient transport. The patient was placed in Biovak and transported to the infectious ward of the teaching hospital. A special ambulance vehicle equipped with a filter unit was used for the transport, which allows overpressure or underpressure to be created in the ambulance, thus preventing the infectious disease from escaping into the environment. In the case of a real intervention, patients suspected of having VNN would be directed to the nearest teaching hospital, which has a special box for a patient suspected of Ebola virus, which is currently the University Hospital Na Bulovce. (Biohazard Team, 2011)

Discussion

The article is focused on the assessment of crisis preparedness of moving a patient with suspected Ebola virus from the airport to an infectious clinic. I dealt with the assessment of the current situation in terms of safety, the analysis of the security situation and transport risks and subsequently proposed measures that eliminate the most serious risks.

In the preparation of the article I used the knowledge gained from employment in a company supplying transport means for a patient suspected of infectious disease, I used information obtained in cooperation with the Ministry of Health, I participated in several IRS model exercises in the Czech Republic and Tomas Bata University in Zlín risks. Furthermore, I used available literature, laws, internet resources, personal experience and my own photo documentation. The practical part is focused on the risks and precautions during the transport of the patient by the exit vehicle of the BIOHAZARD TEAM group in the event of an emergency and the risk during the transport of the patient in the transport bag to the infectious clinic. Specifically, the material equipment was described and during the intervention

of the BIOHAZARD TEAM at the announcement of an emergency, the transport of the patient in case of suspected dangerous Ebola infection. For the preparation of this part I used the knowledge and experience that I gained during my participation in several exercises of the BIOHAZARD TEAM intervention and the announcement of extraordinary events. Chemical suits, BIOVAK transport or decontamination showers. Not only these aids are needed by emergency personnel.

Conclusion

The paper introduces the assessment of crisis preparedness of moving a patient with suspected Ebola virus from the airport to an infectious clinic. It assesses the current state of safety, comparing safety situation and traffic risks. We then proposed measures to eliminate the detection of the most serious threats.

When processing the contributions we used information on how to work with vehicles for a patient suspected of infectious disease. We information about cooperation with the Ministry of Health. We participated in the JRS practice regimes in the Czech Republic and at the Tomas Bata University in Zlín in the field of Risk Management. We literature, laws, references, personal experience and my photographic documentation. Specifically, material equipment and interventions of BIOHAZARD TEAM were used in case of emergency, handover of the patient in case of suspected dangerous Ebola infection. In processing this section, we have taken advantage of the benefits and experiences we have received in the interest in attacking the BIOHAZARD TEAM intervention and announcing extraordinary events. Not only do these tools require personal solutions to deal with emergencies.

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