# Hospitals security options

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**Abstract** The paper focuses on the security of hospitals and, of course, the readiness of the staff so that they are able to react adequately and quickly to dangerous situations. The aggressiveness of patients, visitors, and citizens in general in hospitals is increasing as well as the threat of terrorist attack. That's because there is a greater concentration of people in hospitals and it is not possible to physically secure them at such a level as, for example, nuclear power plants. Hospitals carry out their own security measures within their means. As part of security, some hospitals use security services, CCTV cameras, electronic and mechanical elements. Hospitals employees also participate in various types of trainings and exercises, where they get familiar with the security measures and learn how to react.

**Keywords:** security service, electronic elements, hospitals, protection, staff training, security

## INTRODUCTION

The protection of hospitals, which are publicly accessible places with higher concentration of people and a lower level of security against violent attacks, is a current topic. Hospitals are soft targets. They provide health care twenty-four hours, seven days a week. For this reason, patients come here and so do other people, for example, to visit their loved ones, so a large number of people occurs at the same place at the same time. That is why it is not possible to strictly prevent access to these facilities. Hospitals are meant to serve people and are established for a clearly stated purpose. Except physical attacks without a weapon or even with a weapon, there is a danger of attacks with booby-trapped explosive systems, arson or threats about the possible execution of various types of attacks, that often become a reality. These attacks can result into injury or even loss of human lives. Recently, great emphasis has been placed on the readiness of hospitals and their staff for such situations. A prompt, quick and right response can save lives.

# 1. SECURITY

I use the term "security" for this paper. I refer to security as a system of technical and organizational measures that are meant to ensure the prevention of unauthorized activities, such as theft, terrorist attacks, etc. Security of the organization is a system of measures that aim to protect the organization as a whole as well as its individual organizational components and its employees from external and internal influences (actions, events) that could lead into harm of health, loss of lives, property damage or damage of its legitimate aims and interests related to the existence and activities of the organization in the process of economic competition (Brabec F., 2001). Furthermore, it is necessary to realize that the organization does not only protect those objects that are a part of it, i.e. its own property, its own employees and its own information, but also objects that are outside of it and these include someone else's property, other individuals, other information and interests of other subjects. The fact that the organization also has to protect objects standing outside of it results mainly from generally applicable legal regulations and standards, from contractual obligations and from generally or professionally recognized unwritten rules and habits (Brabec F., 2001).

If someone tends to secure something, these are defined:

- security objective,
- security object,
- method and means of security,
- material and financial costs for implementing security,
- dates by which security measures must be implemented,
- people who bear personal responsibility for the implementation of security (Brabec F., 2001).

We implement security through physical and technical protection, administrative-organizational and regime measures. The most used in many fields is a combination of those.

## 1.1 Crisis scenarios

It is necessary to create a list of crisis scenarios, threats and possible incidents. Threat identification can be done in a number of different ways. Appropriate methods appear to be: comparison with existing lists, identification based on past records, brainstorming and what-if analysis, questioning or consultation, the Delphi method and others. To assess the level of individual threats, it is also possible to use, for example, SNOZ analysis (S - means deadly threats, N - destructive, dangerous, O - influencing, Z - negligible) (Antušák E., 2013). Crisis scenarios can be divided according to several aspects, namely according to the user, event resolution, solution method, binding nature, according to the person who created the scenarios - see table 1.

Crisis scenarios by user:

Crisis scenarios for multinational units - the users are international organizations such as the UN or NATO.

Crisis scenarios for states – contain solutions to situations such as natural disasters or external threats, and are processed by individual states.

Crisis scenarios for regions and municipalities - they develop scenarios from the state level ones and match them to conditions of a specific territory of a self-governing units (Antušák E., 2013).

		Crisis scenarios for
		multinational units
		Crisis scenarios for the
		state
	Crisis scenarios by	Crisis scenarios for
	user	regions and
		municipalities
		Crisis scenarios for
		companies and
		organizations
	Crisis scenarios	Crisis scenarios for a
Division of crisis scenarios	according to an	specific event
	event being	Crisis scenarios for an
	addressed	unpredictable event
	Crisis scenarios by solution method	Alternative crisis
		scenarios
		Simple crisis scenarios
		Binding crisis
	Crisis scenarios by	scenarios
	commitment	Crisis scenarios -
		recommendations
	Crisis scenarios by	Own crisis scenarios
	the author of the	Someone else's crisis
	scenario	scenarios

Table 1: Division of crisis scenarios (source Krizová připravenost firmy. Antušák. E., p. 85, 86)

# 1.2 Safety plan

This document focuses on planning a system of protection against severe violent attacks, not other types of threats. However, good planning in this filed usually has a positive impact on preventing and dealing with other types of threats as well. In addition, the safety plan demonstrates in the case of a dispute or legal proceedings regarding to liability for damage that the organization approaches its possible responsibility for safety responsibly and does not neglect it. It is processed mainly for the reason, that the soft target deputy knows exactly how it will protect its soft target. Therefore it is important to describe exactly how the soft target deputy wants specific situations to be handled both in the area of preventive measures and routine procedures, and also in the case of incidents that may occur in the given place.

The security plan is therefore a manual containing all the information and measures that need to be known and implemented in the question of security of a soft target. It is also a guarantee that even in the case of personnel changes, there will be no disruption in following the measures. Last but not least, it systematizes the security measures taken into one unit, and during its creation, their compatibility and interconnectedness within the entire security system of the soft target is verified (Security plan, 2019).

# 1.3 Physical safety

Physical safety includes measures taken to protect patients, staff and infrastructure from intentional threats by other people. It also includes measures to prevent unauthorized disclosure or loss of information and loss or damage of property. Such measures include the movement control of people and the use of physical and monitoring measures to control security risks (ČSN P CEN/TS 16850, 2020).

## **1.4 Security personnel**

Security personnel can control access, demand proof of security, demand explanations, prevent from entry to specific places, detain people who threaten lives and property and have been caught in the act, open closed areas (Brabec F. 2001. p. 23), do errand activity or operate the control room and the security technologies located in it. Well-trained physical security is the most effective security tool since it acts as a deterrent, early detection, immediate response and it also impacts mitigation. Security personnel can be either employees of a medical facility or employees of a private security service which the institution has a contract with. Security personnel should work on the basis of standardized procedures, which must always be drawn up for a given object and revised regularly. They are detailed for routine activities and also contain procedures for less common situations. Procedures for security incidents, on the other hand, tend to be very brief and have to contain tactical exercises. The basic tool of security personnel is communication. Therefore, the security training plan should also include assertiveness and crisis communication training (Security Plan, 2019).

## 1.5 Staff training

# Training of security personnel

A security service providing services to a hospital has to meet regulatory or legally required educational standards in the security field of the healthcare industry. This safety personnel is also trained to meet the requirements resulting from the conclusions of the risk evaluation (ČSN P CEN/TS 16850, 2020).

## The educational plan has to include:

Continuous, cyclical description based on the PDCA cycle, alignment with the general security policy and risks assessment, training goals and education plan, selection of security requirements, capabilities and skills, assessment methods, testing and skills and knowledge maintenance, regular evaluation of the plan (ČSN P CEN/ TS 16850, 2020).

Training records should include subject, time, length of training, name of instructor(s). Also affiliation and eligibility verification should be included. Before a security guard is given an independent task, he has to not only complete initial training, but also demonstrate his competence for independent work (ČSN P CEN/TS 16850, 2020).

It is necessary to train all employees and for this purpose create a thematic plan for training staff in safety procedures. The frequency of training is at the discretion and capacity of the security manager or other people responsible for the security of soft targets. In the event of a security incident, it is also a good idea to convene a meeting and evaluate a specific solution to the situation (Security Plan, 2019).

## Training of other personnel

In addition to security personnel, it is necessary to work with other employees and train them adequately to increase their security awareness. As part of the protection of soft targets, it is wise to train personnel in basic aspects of security, such as reporting incidents that differ from usual operation, that may lead to significant reduction of the attack impact.

It is important to prepare other personnel for emergency situations as well. Informed and coordinated personnel can significantly reduce the impact of an incident (Safety Plan, 2019).

Training and exercises at Nemocnice České Budějovice a. s. took place in November 2022 and June 2023. A man with a machete attacked the staff, who responded adequately. The practice took place in the Psychiatric Department.

# 2. TECHNICAL SAFETY MEASURES

In addition to a simple list of the technical elements of the security system, it is also necessary to know what the technical security measures serve to, who will use them and how, and who will control their operation. Therefore, as in the case of physical security, it is necessary to set up standardized procedures for their use and evaluation.

Technical safety measures		
Electronical elements	Mechanical elements	
CCTV cameras	Double door	
Alarm security and emergency	Fences and walls	
systems		
Internal radio	Security windows	
X-ray	Roadblocks	
Access and attendance systems	Grilles and shutters	
Other	Other	

 Table 2: Technical security measures (source Soft Target Security Plan p. 14, own addition)

## 2.1 Electronical elements

The first of the two groups of technical security measures are electronic systems such as camera systems, alarm security systems, internal radio and others.

## Camera system (CCTV cameras)

Cameras are the most exposed elements of a video surveillance system and it is important to choose them carefully. The wide range of cameras available in the market, the different functions, the user's expectations, the installation location are often a great issue for less informed people. Therefore, it is advisable to contact proven companies that can advise or provide complete installation and training. It is important to realize, already with the initial costs, who will provide service and supervision of functionality. CCTV cameras are used for monitoring indoor and outdoor spaces, people and events in them and they can be constantly operated by security personnel, or gatekeeper, or to serve only as a recording device for later use (Kalvach Z., 2016).

Camera systems play a great role in the security of hospital facilities. They are located not only in the vicinity of the medical facility, but also in corridors and areas with a higher concentration of people, such as waiting rooms and ambulances. The cameras have sophisticated "smart" functions that, if necessary, can recognize faces, car registration plates, count people, monitor the perimeter or objects, etc.

## Alarm security and emergency systems

Alarm security and emergency systems are actually technical protection systems. Among them we include, for example, alarm security and emergency systems (intrusion and hold-up alarm systems I&HAS), which are combined systems designed to detect an intrusion alarm and an emergency alarm (ČSN EN 50131-1, 2006). A video surveillance system (VSS) is a system consisting of camera equipment, storage, monitoring equipment and other related equipment for the purposes of image transmission and control (ČSN EN 62676-1-1, 2014), etc. Alarm receiving centre (ARC) formerly referred to as a centralized protection desk (PCO) provides the services of a central dispatcher with the possibility of collecting various data from guarded objects and their remote supervision and remote control. Data collection and analysis is important for assessment of the criticality and priority of the incident. Control and confirmation of the incident and subsequent early warning can prevent from fatal consequences of the incident. Po incidentu se bude provádět analýza, a může dojít k upgradu systému. It is also important to pass on the information to other entities that are engaged in the same or similar activities. That is, they should pass on information to other hospitals how to improve the level of security.

## Internal radio

The indoor radio is an extremely functional tool for communication in case of dangerous situations. It is appropriate to set two alarm messages - for evacuation outside (fire evacuation) and for the command to lock in the rooms (lock down).

## Access and attendance systems

In addition to record-keeping purposes, access and attendance systems serve to make it difficult for an unauthorized person to enter, or to limit his/her further movement around the building. However, chip, card, or biometric detection devices are effective in combating common crime or vandalism, but not for active attacker cases. The advantages of visible wearing identification cards are positive and quick identification of people in the area, clear identification of visitors, prevention of unauthorized people to act as authorized ones. Identification cards should contain at least the basic

information: a serial number, a photo, name and surname, instructions for the finder in case of loss of the card, clear colour distinction of the card - for example red for visitors and white for internal workers.

#### Warning spreading systems

Warning spreading systems (mobile applications, SMS gateways) are a very important element of early warning of people in a given location or organization. The message and the possibility of communication with the dispatcher can significantly calm the tension, prevent people from entering dangerous zones, etc.

## Personal attack alarms

Alarms may be necessary for the personal safety of some employees. A quick, reliable and competent response is crucial for the effectiveness of these alarms. When to activate the alarm needs to be determined locally (ČSN P CEN/TS 16850, 2020). If the employee possess this alarm, he/she must be adequately instructed and trained on how to handle it. The alarm should be within his/her reach, it should be functional, periodical control calls or activations should be carried out and the alarm owner should be informed how to react in case of accidental activation.

#### Lighting

Lighting (based on photo sensors) is an underrated security feature. With minimal costs, it serves as one of the most effective deterrents. It is highly effective especially if the light is switched on by a motion sensor (Kalvach Z., 2016). Currently, lighting can also be set to switch on in particular times.

#### Audio monitoring

Recently, a new trend has started to appear in the use of audio equipment. It is a monitoring system that can automatically filter sounds and distinguish them between ordinary sounds and abnormal sounds such as gunshots, screams, breaking glass, etc. A huge advantage of this monitoring system is its functionality in low light conditions or even without a clear or complete loss of image. Nowadays, a very precise position of the sound can be determined by the adequate placement of the sensors. Technological progress is great and some monitoring sound devices are commonly implemented into cameras. On the other hand, the delivered integrated system is important too.

#### 2.2 Mechanical elements

The second group of technical security measures are mechanical systems such as the double door security system, fences and walls, security windows and films, barricades and more.

## Double door security system

Security doors in various certified classes are used to reduce the chance of forced entry and to strengthen the building's shell protection in general. For instance, a security door can withstand an explosion, gunfire or an extremely violent entry attempt. Above all, in combination with access and attendance systems, they are an effective tool for access control. If the security door frames are not embedded in the walls, the entire door loses its blast resistance. Knowing this, it is ideal if security doors are already included in the construction project, as their additional installation, especially in historical buildings, is very complicated. Security windows, resistant to shooting, explosions or throwing objects in various certification classes, are an effective element of the building's shell protection. As with doors, if windows frames are not properly anchored to solid walls, the windows lose their effectiveness. An alternative way how to protect a window against various types of attack, including explosions, are heavy curtains. Fences are a mean of preventing

unauthorized people from entering the property. Not to mention, that in combination with PZTS and CCTV elements, they are an effective tool for securing the perimeter by narrowing access routes (Kalvach Z., 2016).

#### Fences and walls

Fences and walls provide a physical barrier around a certain area or the entire hospital or medical facility. They can be used together with other measures to ensure maximum benefit. This can also be achieved by the principle of multi-level protection. Of course, it is also necessary to carry out regular checks of this mechanical element. If the hospital has a backup entrance that is not secured and is still open, then fences and walls are useless. It is crucial to take specific measures especially for backup entrances. If fast passage is also needed at the backup entrance or if it will only be needed in minimal cases and under specific measures.

#### Safety windows and films

Security windows can be and are recommended for use at receptions. These windows guarantee protection against fragmentation, they effectively protect against vandalism, burglary, or an active attack with a firearm or even against explosive systems. It depends on the resistance of these windows. It is actually glazing against bullets, which ensures a defined resistance against shooting by a specified weapon and ammunition (ČSN EN 1063, 2000). For example, laminated glass is used for these windows, but it is also important to strengthen the surrounding window frame. If the existing windows are already in place and we cannot currently replace them, it is possible to use safety and protective foils. Safety films can also be used on glass door, glass surfaces in vestibules and entrance areas. Safety films are one of the most economical and simplest methods of improving the security of existing glazing.

#### Bars and shutters

Bars and shutters are another element of resistance against burglary, for example. If it is a building shell that is located between the hospital building and a publicly accessible place, then these resistant elements can be easily used. Bars can be fixed, rolling or movable. The rolling grid can be moved vertically or horizontally in front of the opening, which is secured and which can also be rolled up (ČSN EN 1627, 2022). Shutters or front window blinds, whose roller blind consist of movable, mutually connected slats that may or may not fold down, which move inside the groove (ČSN EN 1627, 2022).

#### Roadblocks

Roadblocks are actually structural obstacles that allow controlled access of vehicles or the stopping of vehicles in a marked, specific area. The aim of these roadblocks and obstacles is to lower speed or stop the vehicle as well as to prevent casualties. Location is important when using roadblocks. If there's an area for emergency admission of ambulances, then it is not desirable to build roadblocks here. If there is a large entrance hall and buses arrive next to the entrance hall or if there is a parking lot, the placement of roadblocks in the form of, for example, a concrete trash can or decorative stone makes sense against an active attack by means of transport. The use of concrete benches, sculptures, artistic elements or the use of walls is suitable since they provide elevated protection, while having a minimal visual impact. If there are plastic or metal posts attached on two screws, it will not make sense. Currently, there are also roadblocks that can be placed below the surface of the road and be activated or deactivated at the appropriate time, but they are usually expensive and require deep and wide foundations. Ramp systems, also known as wedge barriers, do not require deep foundations, but they are visually disruptive because the metal plates are visible on the road surface.

## 3. CONCLUSION

Violent attacks, attacks with or without a weapon are always stressful. Training of hospital employees and modification of facilities are one of the ways how to prevent or at least reduce attacks on these facilities, and especially on people in these facilities. Preparedness for possible attack scenarios and above all practicing these scenarios should be an important part of the training of all hospital employees. The use of security personnel to secure hospitals is increasingly being used. It should also be noted that there are various electronic and mechanical elements that can eliminate or at least reduce the damage to health, lives and hospital property.

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