
Evacuation of the Inpatient Department of a Medical Facility

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doi: 10.51505/ijmshr.2024.8501

URL: <http://dx.doi.org/10.51505/ijmshr.2024.8501>

Received: July 30, 2024

Accepted: Aug 16, 2024

Online Published: Sep 06, 2024

Abstract

Evacuation is one of the ways to protect the population and is a set of principles and organizational measures ensuring the transfer of people, animals and material resources from the area at risk of emergency to another territory. In the event of an emergency, the evacuation may include not only inhabited agglomerations and industrial facilities, but also medical facilities, where patients who depend on the care of medical staff and the supply of medical services increase the complexity of the situation. The evacuation of the medical facility itself represents a complex of partial evacuation plans and standard procedures for individual departments of the medical facility. The article presents one of the possibilities of preparation and evacuation of a selected inpatient department of a medical facility.

Keywords: evacuation, evacuation plan, crisis, healthcare facility,

1. Evacuation

Evacuation is a set of organisational and technical measures ensuring the relocation of people, animals and material resources in a specified order of priority from areas at risk of an emergency to locations where alternative accommodation and catering is provided for people, housing for animals and storage for material items. Evacuation applies to all people in the places threatened by an emergency, except those who will be involved in rescue activities, management of evacuation measures, or will perform other urgent activities to ensure minimization of the consequences of the emergency.

In the Czech Republic, the basic legal requirements for evacuation are stipulated in statutory and sub-statutory norms, such as the Crisis Act No. 240/2000 Coll., the Act on the Integrated Rescue System No. 239/2000 Coll., the Act on Ensuring the Defence of the Czech Republic No. 222/1999 Coll., the Decree of the Ministry of the Interior on Fire Prevention No. 246/2001 Coll., the Decree of the Ministry of the Interior on the Preparation and Execution of Population Protection Tasks No. 380/2002 Coll. and many others. According to the provisions of Decree No.328/2001 Coll., on certain details of the security of the integrated rescue system, evacuation is one of the plans of specific activities that are processed within the emergency plan of the region. In the event of an emergency threatening a larger territory, the area evacuation may

include not only populated agglomerations and industrial facilities, but also inpatient medical facilities where the complexity of the situation is increased by patients dependent on the care of medical staff and the supply of medical services.

At present, no legal standard clearly stipulates that health care facilities must have plans for complete evacuation. However, the Decree No. 380/2002 Coll § 12 par. 4 a) of the Ministry of the Interior on the Preparation and Execution of Population Protection Tasks states that “evacuation shall be planned to deal with emergencies that require the announcement of the third or special level of alert.” These alert levels are announced in the cases defined in § 23 and 24.

In compliance with § 23:

- the third level of alert is announced when the emergency threatens more than 100 and not more than 1000 people, a part of a municipality or the premises of a company, or rescue and disposal work is carried out by basic and other forces, or it is necessary to coordinate the forces in a joint operation by the intervention commander with the help of the intervention commander's staff and to divide the area into sectors and sections (Decree No 380/2002).

In compliance with § 24:

- the special level of alert is announced in the case when the emergency threatens more than 1000 people, rescue and disposal work is carried out by basic and other forces, including the use of forces and resources from other regions, or if it is necessary to coordinate the forces in a joint operation at the intervention area by the intervention commander with the help of the intervention commander's staff and to divide the area into sectors and sections (Decree No 380/2002).

According to the Institute of Health Information and Statistics (UZIS), as of 31 December 2017, the network of health care facilities in the Czech Republic consisted of 194 hospitals (acute and follow-up care) with a total of 60,328 beds and 120 specialised medical institutions (including convalescent homes and hospices, excluding spas), providing a total of 17,412 beds.

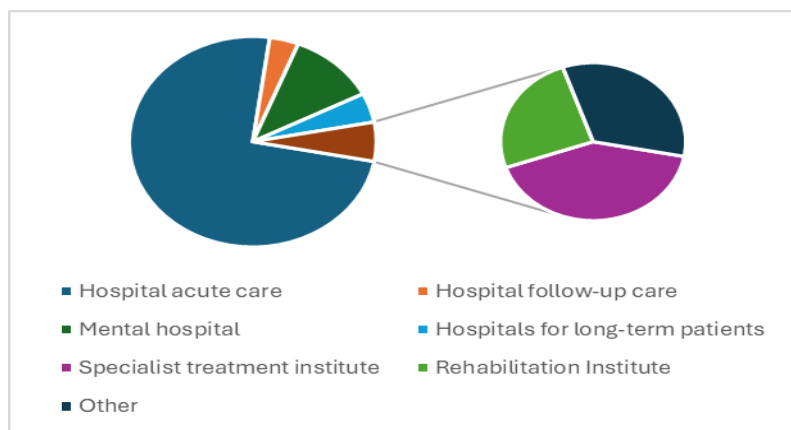


Figure 1: Distribution of bed capacity in the Czech Republic in 2017 by type of health care provider (UZIS 2017)

Beds in psychiatric hospitals accounted for 51.1% (8 894 beds) of the total bed capacity of specialised medical institutions, while beds in long-term care facilities accounted for 19.9% (3 457 beds). In terms of the form of health care, in 2018, acute care was provided on 48,173 beds, follow-up and long-term care were provided on 29,301 beds, and overnight care was provided on 266 beds (ÚZIS 2019). Of the total number of health facilities, there were 145 hospitals with a capacity of more than 100 beds, twelve of which had a capacity of 1000 beds or more. If solely the number of patients is taken into account, then in the event of an emergency, 133 health care facilities meet the condition for announcing the level three alert and 12 meet the criteria for announcing the special level of alert.

The above only confirms the fact that inpatient medical facilities must have plans for evacuation, both for partial and full evacuation. Evacuation plans for inpatient health facilities should be part of the internal emergency readiness plan. The latter is, by its nature and content, a plan for its response to threat which the facility is facing. The internal emergency readiness plan expresses not only the ability of the healthcare facility to participate in the recovery from the aftermath of an emergency and/or crisis situation, but also its ability to respond to threats directly threatening it and endangering its functionality as a healthcare provider (Štorek. 2015).

2. Planning the evacuation of an inpatient department of a medical facility

The evacuation plan for an inpatient ward of a healthcare facility should be based on an analysis of potential risks and threats. The causes leading to the occurrence of an emergency can be divided into internal and external. Internal ones depend mainly on the structure and equipment of the health facility. External ones may cause prolonged shutdown of the health facility or significant limitation of its activities (Folwareczny, Pokorný. 2006). Examples of internal threats:

- accidental or deliberate leakage of a toxic, flammable or explosive substance inside the premises,
- long-term power and gas supply outages and water supply breakdowns,
- accidental or deliberate fire (explosion) in the premises,
- trap explosive (toxic, radioactive, biological) system

Examples of external threats:

- accidental or deliberate leakage of a toxic, flammable or explosive substance outside the premises,
- accidental or deliberate fire or explosion outside the premises,
- long-term power and gas supply outages and water supply breakdowns,
- radiation accidents outside the premises,
- natural disasters.

When planning the evacuation of a medical facility, it is necessary to keep in mind that it is an evacuation of people with reduced mobility and orientation. The evacuation of an inpatient medical facility must therefore always be a controlled process. All hospitalised patients must be evacuated in an organised manner and under the guidance of a medical personnel. Even in this case, patients must be guaranteed continuity of care. Separate evacuation is only an option for outpatients.

The basic condition guaranteeing safety of people is the possibility of escape into the protected way-out route and/or into an open-air area. These escape routes shall be open with unblocked doors that are operationally lockable, sufficiently wide and, in particular, it is necessary to emphasise the marking of the direction of escape for these people. Especially, the layout of healthcare facilities is complex and difficult to navigate under normal operating conditions, which will be significantly exacerbated in the event of a fire alarm. Therefore, in relation to the evacuation of people able to move independently, it is necessary to ensure, as one of the basic conditions, correct and clear escape directions in the event of a fire alarm when people tend to leave the way they came from, which may be the least acceptable situation.

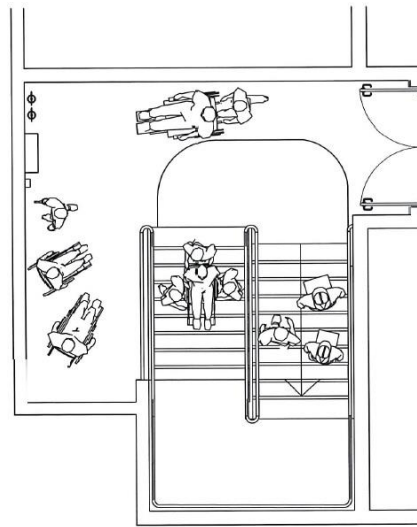


Figure 2: Fire escape staircase (with adjacent evacuation room)

2.1 Evacuation of persons with limited mobility or unable to move independently

Regarding the evacuation of people incapable of independent movement or orientation, organisational measures and training procedures (possibly simulated) for individual parts of the building must be applied separately as part of the elaboration of evacuation plans.

In terms of layout, operation and organisation, the inpatient departments of medical facilities in particular are so different that the following steps must be taken and linked to the functions of fire safety organization and incorporated into the Evacuation Plan:

- specify directions of escape to protected escape route(s) and/or to the open-air area for each department or service unit on each floor,
- determine options for transferring bedridden patients to another fire protection section on the affected floor, if possible,
- establish minimum personnel numbers for these activities, or to determine from which other workplaces it will be possible to call in reinforcements without causing critical situations at these workplaces,
- test the pre-set scenarios in a simulated way (without patients) as far as possible and practice regularly once a year, as personnel change,

- incorporate the chosen options into the Evacuation Plan, which must be permanently and visibly displayed for all personnel.

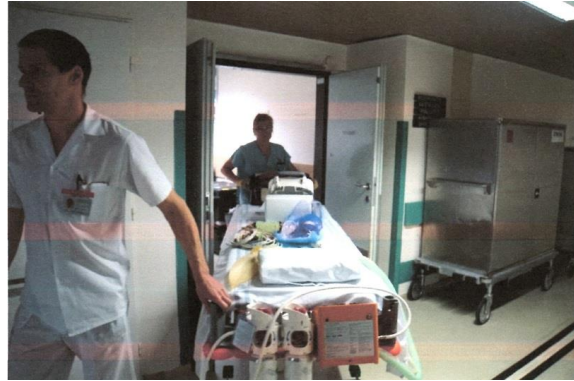


Figure 3: Patient transport by two paramedics

2.3 Fire alarm zones

The intent of designating alarm zones is primarily the need to announce a fire alarm at the location of the fire and the surrounding affected areas. Since announcement of a fire alarm throughout a whole building is not always practical or effective, the alarm zones must correspond to the fire protection sections.

With regard to operating theatres, or other similar workplaces, it is recommended to install an evacuation PA system without sound signalling so that staff in such a workplace is informed immediately of what has happened, and in particular where it happened, and why the fire alarm is sounding, so that the operator can determine the next course of action based on the specific information. When informed by the evacuation PA system that there is a fire on the floor, but its location is not so close to endanger the operating theatre, the operator should be able to make a decision on the next course of action.

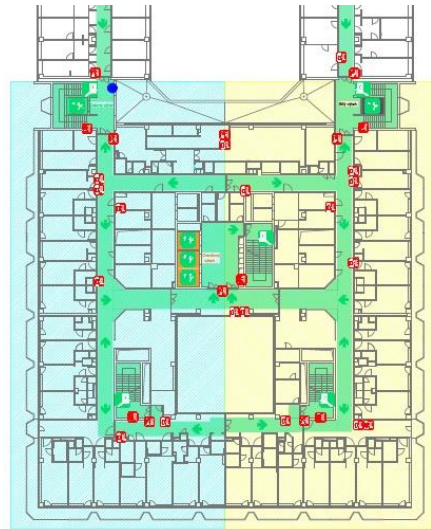


Figure 4: Division of an inpatient ward into two fire sections

Operation of the sound fire alarm in the alarm zone of the floor where the activation of the detector without delay is installed – runs for 20 seconds - followed by an announcement through the evacuation PA system to the sound zone of the floor concerned (voice recorded loop or announcement by the control panel operator - recommended time up to 20 seconds) - followed by sound signalling for 20 seconds - this is how the modes alternate in the alarm zone on the affected floor until the alarm is switched off by the control panel operator of the Electronic fire alarm system (EPS equipment), i.e. the end of the sound and voice-operated fire alarm signalling. In the first phase, people are evacuated to the adjacent fire protection section.

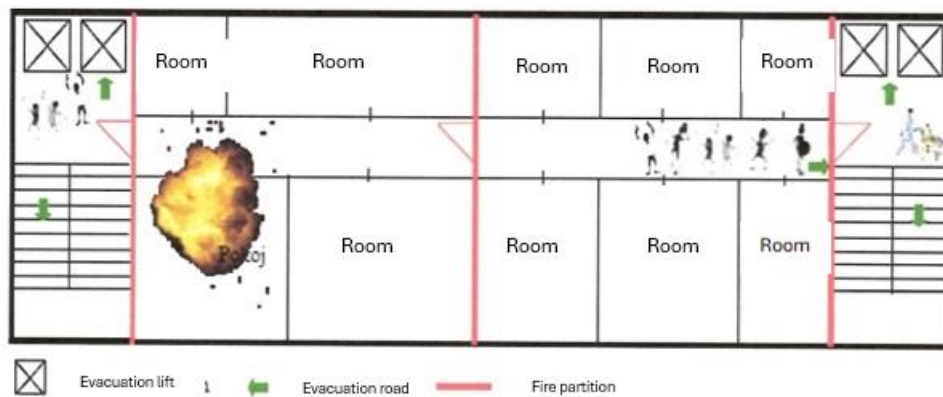


Figure 5: Evacuation of people to the nearest fire protection section

If the fire effects activating the EPS control panel extend to another sound zone and/or another floor, the mode shall also apply in that sound zone or on that other floor. If the fire signs are signalled from more than two floors, i.e. the third floor or higher, the fire alarm shall be activated

on all floors in the building upwards without any time delay from the time of the signal from the third affected floor.

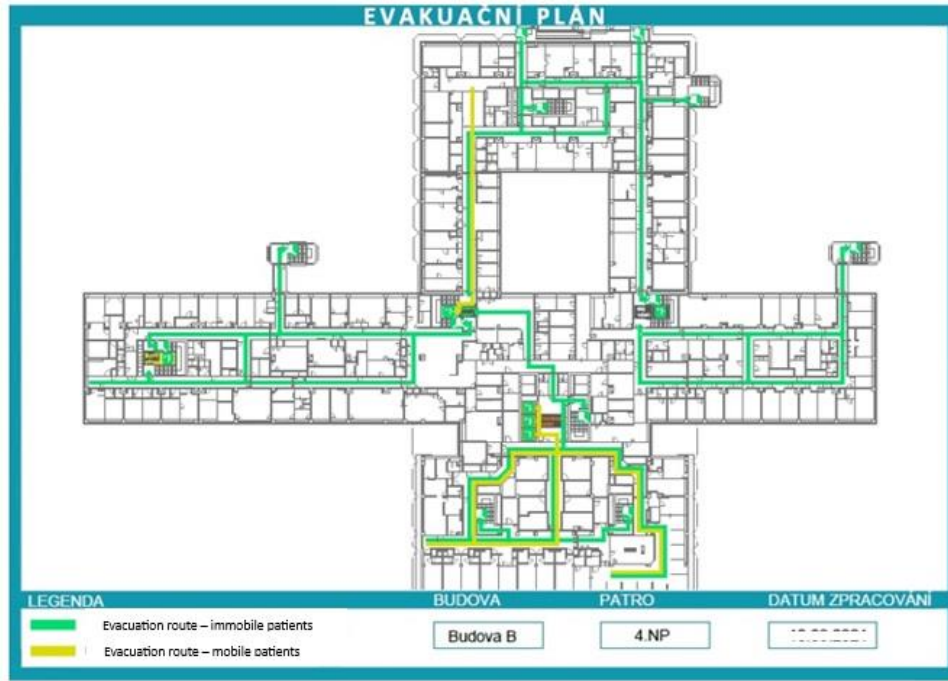


Figure 6: Evacuation of people from the building

The fire alarm on the downward floors shall be activated after 5 minutes from the time when three floors or more are affected. In this case, it will already be a building-wide alarm. Termination will be done through sound and voice-operated alarm by the operator at the control panel of the EPS equipment.

3 Discussion

It is always important to approach the issue of evacuating a medical facility responsibly, as it is a very complex process, the organisation of which stands and falls not only on each member of the personnel, but also on the hospital management and members of the crisis staff. However, a highly erudite and sufficiently trained staff has always played an indispensable role at all levels of evacuation management, from the top management of the healthcare facility to the staff of individual inpatient wards who will directly provide care for patients during an evacuation if such an event occurs.

The spectrum of organizational measures and optimal procedures leading to perfect management of evacuation of an inpatient medical facility is very wide. Fortunately, evacuations of healthcare facilities do not occur often. However, when a situation that requires mass transfer of patients from these facilities to safer locations does arise, the entire process must be carried out

quickly and efficiently and, in particular, in such a manner that the deterioration of the patients' health status is minimised before and, more importantly, during transport.

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