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Hospital evacuation: planning, assessment, performance and evaluation

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Abstract: **Background:** Malfunction in hospitals´ complex internal systems, or extern threats, may result in a hospital evacuation. Factors contributing to such evacuation must be identified, analyzed and action plans should be prepared. Our aims in this short report were 1) to evaluate the use of risk and vulnerability analysis as a basis for hospital evacuation plan, 2) to identify risks/hazards triggering an evacuation and evaluate the respond needed and 3) to propose a template with main key points for planning, performance and evaluation of such evacuation. **Methods:** A risk and vulnerability analysis at two county hospitals along with an online literature search based on the following keywords; "evacuation/ closure", "hospitals/medical facilities" and "disaster/hazards" alone or with "planning", was conducted. **Results:** We found that although all hospitals have a disaster plan, there is a lack of knowledge and appropriate instruments to plan, perform and evaluate a hospital evacuation. Risk and vulnerability analysis can be used to identify key points in an evacuation such as threats and resources, which later can be used to plan, perform and evaluate an evacuation. **Conclusion:** There is a need for an elaborated evacuation planning for hospitals. An evacuation plan should continuously be drilled based on a risk and vulnerability analysis. A general guide can be used as foundation to plan, perform and evaluate such plan.

KEYWORDS: Hospital evacuation, risk and vulnerability analysis, disaster, plan

Hospitals are key factors to provide emergency preparedness in most communities and are expected to be fully functional at the time of major incidents/disasters. [1] Hospital´s medical disaster plans focus on how hospitals surge their capacity to receive a large number of victims. However, the increasing complexity in technical infrastructure as well as a more constrained healthcare economy, leads to an increasing vulnerability of hospitals and risk for failure in crisis management. [2] The threats and hazards in today´s society are also more complex than previously and often require cross-border cooperation between involved organizations and consequently, changes the basic requirements for the management of a major disaster. [1-3]

Today, stockpiles of equipments and materials in the hospitals have been reduced in favor of "same day delivery" resupplying. Bed occupancy, especially in intensive care units, has increased. The emergency medical plan is often written for management of external events, *i.e.* events that will bring casualties to the intact hospital. However, what if the threat is pointed against the hospital and the patients must be evacuated? [1, 4-7] Is such evacuation necessary and is there any routine for such action? One way to approach all of these questions is to perform risk and vulnerability analysis. [8-12]

Hospital vulnerability varies among different countries both in terms of locations and events. In some countries (*e.g.* in South America) over 50% of healthcare facilities (hospitals and primary healthcare clinics) are located in high risk areas, while the figure is much lower (8-9%) for other countries such as United Kingdom. [6]

Under Swedish law, all county councils ("Health Boards") are required to maintain "emergency medical preparedness" in their geographical area of responsibility. [11] Every hospital should have a disaster plan, including an evacuation plan. Although no large-scale evacuation of Swedish hospitals has been reported, there is no available data if the hospitals have any functional evacuation plan and if this plan has been drilled or actually used. [13]

The purpose of this short report was therefore, to evaluate if there is a need for an evacuation plan in hospitals and how it should be designed by raising a number of issues;

Can an appropriate Risk and vulnerability analysis (RVA) be used as a foundation for evacuation planning in hospitals in general?

What hazards can trigger a hospital evacuation?

How can rescue resources (internal and external) respond to the needs that arise in an evacuation situation?

How such plan should be performed and evaluated?

Materials and methods

A risk and vulnerability analysis was performed at two county hospitals in Region Västra Götaland in Sweden. Lidköping hospital (2008) has 132 beds and around 1000 employees and serves 85000 inhabitants. Kungälv hospital (2010) has 200 beds and over 1400 employees and serves 118000 inhabitants.

A *risk management group* consisting of an emergency nurse, hospital director, chief physician and the heads of the departments of surgery, emergency medicine and anesthesiology, a medical utility technician and an IT coordinator was used for analyzing process. Group discussions were used as a tool to reason about various possible risk scenarios in each hospital, respectively. Three types of risk and vulnerability analyses forming the ground for analyses were; [12]

– MVA (Municipal Vulnerability Analysis): an IT-based method to analyze vulnerabilities in an organization, developed by a team of researchers at Lund University, Sweden.

- ROSA (Risk Och Sårbarhets Analys): based on qualitative risk assessments by a risk management team, developed by a research team from Växjö, Sweden.

- IBERO (Instrument för BERedskapsvärdering av Områdesansvar): developed by the county administrative board of Stockholm County, Sweden as an aid to analyze the ability to withstand and manage events with major consequences for social functions or citizens.

An online literature search was conducted, using the Pub Med, Scholar, ELIN, LOVISA, LIBRIS and CRED (the Centre for Research on Disaster Epidemiology database) and medical libraries (*e.g.* Gothenburg University) based on the keywords; "evacuation/closure", "hospitals/medical facilities" and "disaster/hazards" alone or with "planning".

Results

Risk and vulnerability analysis

Table 1: The keywords used in our risk and vulnerability analysis

Key words	Definitions
Critical/Triggering event	How quick critical events reach the patients and personnel?
Duration of an event	Static or dynamic event process?
Time to evacuation	Minutes, hours, days
Total or partial evacuation	Influencing parts of or whole hospital?
Magnitude level	Locally, regionally, national or internationally.
Staff resources within the hospital	Can the event be managed with existing staff or there is a need for extra staff from other units?
Influence on other activities than healthcare	Other involving organizations? How many?
Functional recovery	How long does it take for the hospital to get back to its normal level of function and capacity? (quick or slow recovery)

Table 2: The results of risk and vulnerability analysis at two county hospitals

Potential Hazards	Fire Flooding Landslides Pandemic Electricity/heat/water failure Threat/bomb threat/terror threat Accident involving dangerous goods Infection with multi-resistant bacteria
These risks could be grouped into two various types of events	An unpredictable event with a very rapid progress, requiring swift action *e.g.* a threat/bomb threat/act of terrorism. This incident is intentional and can never or rarely be predicted. An event evolving over a longer period of time, but with major impact and long time to restore function *e.g.* flooding. The sequence is considerably slower and more time is available to prepare for a possible evacuation. The problem in such an event may be that hospital infrastructure (power, heat and/or water) is also affected as well as other parts of society.
Key factors for hospital evacuation based on our case study	Need for a distinct command structure and organization Identification of transport possibilities External space and rooms Triage Location of sensitive infra-structure equipment such as servers and power generator with regard to potential hazards and threats How to ensure patient safety during the evacuation? Transfer or ongoing maintenance of patient medical records? How are staff/patients/relatives warned and informed of the situation? What are the responsibilities of external contractors? How to carry on the evacuation of seriously ill patients in an intensive care unit? Who is responsible for guarding the buildings when they are empty? To where will patients in need of care and treatment be evacuated? Another hospital, another town?

Although all three analyzing methods give an overview on how to work with risk and vulnerability analysis and highlight the importance of the analyzing process as a crucial part of the result, initially it was desirable to use one method that illustrates what is worth preserving in order to create a common value (MVA, IBERO). However, since various methods have a somewhat similar target, instead of using one method, a combination of all three could be used in the different phases of the analysis.

The goal of this type of analysis was to find "corresponding type of incidents" which may need "analogous inquiries" for triggering the evacuation, *i.e.* similar risks and thus similar requirements for evacuation such as time to evacuation, coverage and restoration of function. By classifying various events with the same keywords, their number could then be reduced. The keywords used in our analysis are shown in table 1. The result of risk and vulnerability analysis is presented in table 2 (a-c).

Current resource analysis at these hospitals showed that the average occupancy rate for 2008 at Lidköping hospital and 2010 for Kungälvs hospital varied between 85 and 98 percent. All patients admitted to the hospital were in need of continuous care and could not easily be moved in an emergency situation. Key factors regarding hospital evacuation are presented in table 2 c. Both hospitals could present a solid and sufficient disaster plan, but no evacuation plan. The same result was also obtained from four other regions in Sweden through telephone interview with their disaster planning officers. None of the hospital had repeated drills/ exercises.

Literature study

All documents found in our search were reviewed (2450 hits). All documents dealing with instructions, guidelines or other than hospital evacuations were excluded. Of the remaining one hundred scientific documents those dealing with our aims *i.e.* risk and vulnerability analysis, hazards triggering a hospital evacuation, response to an evacuation situation, and design of an evacuation plan was studied in detail. Table 3 shows the results of our search. Many papers were reviews and lesson learned. There were also KAMEDO reports, which are reports with the main task of sending observers to disaster areas all over the world to study recent disasters, collect useful information and increase the familiarity with the problems of disaster medicine. [13]

The main results of these reviews are as follow;

There are both internal and external threats leading to evacuation

There is no accepted, validated tools to assess the hospital evacuation process

There is a need for distinct coordination and leadership and central command

Table 3: Shows the results of the literature study

Author	Study type	Year	Outcome
Bagaria et al (6)	Review 1980-2008	2009	45 hospital evacuations Triggers for evacuations were earthquakes, hurricanes, flooding, power failure, water damage, bomb threat Minority were complete (flooding and natural disasters) and the majority partial (chemicals, internal fires, nuclear events) 85% were immediate and 15% delayed (mainly natural hazards) Over 90% of hospital managed their own evacuation, but only 6% had a specific evacuation plan The most two common challenges were communication (external and internal) and logistic particularly moving the patients (in and out); elevators, transport vehicles The positive outcome of some of the event was probably, among the others, due to education, and training of the personnel
Kader (9)	Thesis	2008	Evacuation procedure should be smooth and easy, to reduce travel time and extensive efforts for patients' transfer, especially the critical ones Evacuation systems need to be designed based on nature of threats and hazards Multiple evacuation exits should provide to a building, and should distribute the exits horizontally and vertically The zoning of important functions should consider the threats and vulnerability, e.g. switch gear or generators. Critical functions of a hospital should have the options and flexibility to accommodate extensive services In hospital complex design, it is wise to connect one building with others in different levels, specifically, where the critically ill patients are located to avoid the vertical evacuation Multiple accesses to the site with adequate space for transportation required for mass evacuation Location of helipad should threat specific A hospital should have both external and internal assembly areas Specific attention should be paid to the elevator as the practical way to transfer patients vertically Stairwell design should consider the turning radius of various specialized devices, such as Backboard Emergency power supply should be protected from any kind of hazards to provide continuous support for evacuation Facilities, such as, communication system, lighting, signage, or clock should be designed with two types of operating system; electricity and battery Flash lights should be located in all units and stairwells with proper hanging system
Social-styrelsen (15)	KAMEDO report	2007	A sudden and widespread power failure at the Karolinska University Hospital in Huddinge, Sweden. Although lasting about one and a half hour, it endangers the patient safety, and incoming ambulances were diverted to other hospitals, resulting in an overloading of these hospitals. The conclusion was that the emergency plan for a hospital must include internal events such as disruption of hospital supplies, infrastructure disturbances, disruption of water and gas supply and fires
Augustine et al	Case Study	2005	All staff need incident command system training Size of evacuation zone will vary with event Identity alternate patient care areas and transport needs based on evacuation zone Financial consideration Importance of good community relations Re-evaluating existing (bomb) threat and evacuations plan

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Table 3: continued

Taffee et al	Review 2005		There are issues and complexities Issues; Nature of threat, risk to patients and staff, evacuation mode, continuing care, resource demand Complexities; Threat probabilities and timing, change of risk over time, resource contention, scale and scope, facility-dependent activity time Modeling approaches; Project model, Mathematical programming, Simulation, hybrid model, Models in plan evaluation
Schultz et al (4)	Case Study 1994	2005	No accepted, validated survey tools to assess the hospital evacuation process exists Following principal subjects are important in a hospital evacuation process; hospital demographics, description of existing disaster response plans, an event´s impact o the hospital operations, decision-making and incident command, movement of patients within the facility and off-site institutions and hospital recovery
Sternberg et al (12)	Review 1971-1999	2004	275 hospital evacuations > 50% due to internal hazards Increasing number per decades Most evacuations were due to incidents with less than 49 evacuees Most common cause internal fire (23%) followed by HazMat, hurricane, human threat, earthquakes, flooding In 11% of evacuations at least one casualty were listed
Schultz et al (25)	Review 1995-1996	2003	Eight centers were studied 74-334 inpatients at evacuation 75% immediate evacuation 75% complete evacuations 70% nonstructural damages 2-320 patients transferred 70% to other hospitals Evacuation time 1-19 h Evacuations can be accomplished quickly and safely with the use of available personnel and resources
Socialstyrelsen (15)	KAMEDO report	2002	Severe flooding in parts of the Czech Republic and southern Germany because of heavy rain Several hospitals had to be evacuated due to loss of electric power, heat, water and sanitation. Lessons learned from this incident were that a distinct coordination and leadership are key issues. A central command organization with clear-cut responsibilities and authority is crucial. A hospital at risk of flooding should not have electric power, water, heat, sanitation and computer servers installed in the basements
Burgess et al (13)	Review 1991-1996	1999	101 hospitals 13% (12) due to HazMat 11 incidents at ED, inhalation common hazard exposure

There is a need for cross-border communication and collaboration with other authorities

There is a need for relocating vital functions from the lowest floor to safer area

There is a need for adequate estimation of resources and staff

There is a need for repeated and validated training of staff

There is a need for careful assessment of relocating area for evacuee

There is a need for careful assessment of transportation vehicles and routs

There is need for careful assessment of hospitals infrastructure with respect to type of building and utilities and supporting functions

Discussion

Our findings show that there are potential risks and hazards, which may lead to hospital evacuation and make a continuous planning process necessary. [7] We could also show that the current hospital disaster plans have no or insufficient evacuation plans. [10] Furthermore, this report suggests that some common factors should be taken into consideration when preparing a hospital evacuation plan.

There is a need for distinct command and control structure to control the event and take proper decisions. A decision to evacuate a hospital is not easily taken, but it should be taken

without any hesitation, if anything endangers patients' safety. [6] Such decisions demand good communications within and outside of the hospital.

Different geographical areas are facing various threats. The specific location of a hospital and its infrastructure, including back-up systems and external space influences the risk profile of that specific hospital and thus the need for an evacuation. Experiences from reported incidents (table 3), singles out electric power supply as one of crucial factors in hospital evacuations. The black-out at Huddinge Hospital clearly demonstrates how various functions in a hospital such as access to medical files and drugs depend on electric power. [4-6, 14-17] During the fire at Royal Marsden Hospital electricity functioned throughout the evacuation phase, which was one of the reasons why the evacuation proceeded smoothly. [6]

Another important step in an evacuation planning is to identify the resources suitable for transportation of patients both within the affected area and to other facilities. External space and rooms for temporary evacuation, and internal facilities to ease the evacuation such as elevators for vertical evacuation and adjusted stairwells with adequate turning radius are some of the points to consider in an evacuation plan. [10] The planning for transportation of patients to other facilities must be done at the regional or national level, since it requires an overview of transportation resources and routes at the regional level and might incorporate military assets. [18] Transferring medical records and distributing drugs during the transport must moreover, be pre-planned. An increasing use of computer-based medical records (without any national standardization) raises the vulnerability of information transfer and exchange.

Contingency planning must be based on a good and dynamic understanding of the threats that exist and the human response needed. [4, 10] Thus, in order to reduce the number of events enforcing an evacuation, a more proactive approach with qualitative assessments is needed. This can partly be obtained by using RVA to clarify what, where and how it has to be planned. [19] As an evacuation situation involves the entire hospital's activities and several actors in and out of the hospitals, seminar-based analysis can be used as an aid to involve people with various skills and different backgrounds. Although it is possible that certain events occur as a consequence of others, a case study focuses on one event at the time. As an example a fire in a main electric cable drum may result in an immediate power failure causing other major difficulties. To identify all dependencies is difficult, but knowing that one event can generate another is important because the consequences can be far more extensive if multiple technical systems are shut down. All of these events, irrespective of the cause, will generate a burden on other hospitals that are to receive the evacuated patients.

During the last decades, the number of hospital beds in Sweden, as well as other countries, has been reduced. Hospital occupancy rates are high with few beds immediately available if a sudden influx of patients occurs. Crowded hospitals and ambulance diversions, on a regular basis, can decrease the quality of medical care as well as ambulance availability and surge capacity. [2] These are important factors to consider in contingency planning and must also be incorporated in the decision-making process of the healthcare system. It is therefore, desirable to plan based on the risks' nature rather than specific events. In order to reduce the complexity of all factors influencing an incident causing an evacuation, they could be categorized according to the following keywords; [9]

Speed; the time the critical event reaches people, property and the environment?

External factors such as temperature, wind, rain, smoke or landslide

The *intensity* of the incident, how great is the power of the threat?

Geographical coverage of the event, which area is involved?

The *duration* of the event, how long is the imminent danger?

The *probability* of the event, are we sure that the event will occur?

Depending on the nature of the threat/incident, different demands arise in an organization leading to various responses. [6] While landslides, pandemics and infection by multiresistant bacteria are events that may not initialize a complete, but a partial and gradual evacuation or reallocation of an internal resource (*e.g.* closing down the elective surgery), a fire within the hospital might necessitate an immediate evacuation of patients and staff at risk to a temporary shelter for further transportation to other healthcare facilities. Busses (and other vehicles) might be considered as transporting means instead of ambulances. [20]

Swedish Legislation demands that every hospital should have a medical disaster plan, including an evacuation plan. However, planning for internal incidents that might lead to a hospital evacuation is rudimentary or non-existent and regardless of cause, most plans are never drilled. [6, 14] Moving a patient may require the mobilization of different staff categories in various levels. It is therefore, imperative that these actions are carefully prepared before an evacuation is carried out (Template 1). An evacuation plan must also be repeatedly exercised to ensure that all staff know their roles and feel confident in an evacuation situation. [5, 20-27] The plan should be

generic with a simple design and cover most of the incidents that may occur. Template 1 shows one simple protocol to be used before, during and after an evacuation. Although such a protocol can be more detailed, our proposal consists of major points shown by our study and literature review and can be taken as a first step for establishing an evacuation plan.

Conclusion

Hospitals are becoming increasingly dependent on sophisticated technological support systems as well as same day delivery of supplies, often supplied by external subcontractors. “New events” such as terrorist actions introduce new vulnerabilities to the healthcare system. Current evacuation planning at most hospitals in Sweden (and elsewhere) is inadequate and rarely exercised. Planning must be based on a continuous risk and vulnerability analysis and consists of good communication, functional logistic and training opportunities.

References

1. Adini B, Goldberg A, Laor D, Cohen R, Zadok R, Bar-Dayan Y. Assessing levels of hospitals emergency preparedness. *Prehosp Disaster Med* 2006; 21: 451-457
2. Khorram-Manesh A, Hedelin A, Örtenwall P. Hospital-related incidents; causes and its impact on disaster preparedness and prehospital organisations. *Scand J Trauma Resusc Emerg Med* 2009; 17: 26
3. Socialstyrelsen. *Det Robusta sjukhuset*. The national board of health and welfare, Stockholm, Sweden 2002. Article nr 2002-110-19, ISBN 91-7201-707-4
4. Cocanour CS, Allen SJ, Mazabob J, Sparks JW, Fischer CP, Romans J, et al. Lessons learned from the evacuation of an urban teaching hospital. *Arch Surg* 2002; 137: 1141-1145
5. Schultz CH, Koenig KL, Auf der Heide E, Olson R. Benchmarking for hospital evacuation: A critical data collection tool. *Prehosp Disaster Med* 2005; 20: 331-342
6. Bagaria J, Heggie C, Abrahams J, and Murray V. Evacuations and sheltering of hospitals in emergencies: A review of international experience. *Prehosp Disaster Med* 2009; 24: 461-467
7. Taaffe KM, Kohl R, Kimbler DL. Hospital evacuation: issues and complexities. Department of Industrial Engineering, Clemson University, USA 2005, ISBN 0-7803-9519-0
8. Quarantelli EL. Major criteria for judging disaster planning and managing their applicability in developing countries, University of Delaware Disaster Research Center, USA, 1998. http://dspace.udel.edu:8080/dspace/handle/19716/286
9. Lindell K, Perry RW. Preparedness for Emergency Response: Guidelines for the Emergency Planning Process. *Disasters* 2003; 27: 336-350
10. Sharmin Kader: Development of design strategies to support evacuation process of hospital buildings in United States. Thesis. 2008.
11. http://repository.tamu.edu/bitstream/handle/1969.1/ETD-TAMU-2328/KADER-THESIS.pdf?sequence=1
12. Svensk författningssamling (SFS) (1982:763), *Hälso- och Sjukvårdslagen (HSL)*, Socialdepartementet. http://www.riksdagen.se/webbnav/index.aspx?bet=1982:763&nid=3911
13. Johansson H, Jönsson H. *Metoder för risk- och sårbarhetsanalys ur ett systemperspektiv*, rapport 1010, LUCRAM, Lund, 2007.
14. http://www.lu.se/upload/LUCRAM/Publikationer/1010.pdf
15. Socialstyrelsen. Kamedo reports. http://www.socialstyrelsen.se/kamedo)
16. Socialstyrelsen. *Strömavbrottet på Karolinska Universitetssjukhuset Huddinge den 7 April 2007*, KAMEDO-rapport 93, The national board of health and welfare, Stockholm, Sweden 2008. http://www.socialstyrelsen.se/publikationer2008/2008-126-15
17. Sternberg E, Lee GC, Huard D. Counting crisis: US hospitals evacuations, 1971-1999. *Prehosp Disaster Med* 2004; 19: 150-157
18. Burgess JL. Hospital evacuations due to hazardous materials incidents. *Am J Emerg Med* 1999; 17: 50-52
19. Socialstyrelsen. *Översvämningarna i Tjeckien och östra Tyskland 2002*, KAMEDO-rapport 88, The national board of health and welfare, Stockholm, Sweden 2006. http://www.socialstyrelsen.se/publikationer2006/2006-123-2
20. Khorram-Manesh A, Hedelin A, Örtenwall P. Regional coordination in medical emergencies and major incidents; plan, execute and teach. *Scand J Trauma Resusc Emerg Med* 2009; 17: 32
21. Abrahamsson M, Magnusson SE. *Användning av risk- och sårbarhetsanalyser i samhällets krishantering*, rapport 1007, Lund 2004.
22. http://lup.lub.lu.se/luur/download?func=downloadFile&recordOId=767683&fileOId=1053549
23. Chaudhari J, Booth J, Ye Z, Kack D. Evacuation Preparedness of Public Transportation and School Buses in Rural Coastal Communities of the North Gulf Region. Coastal Research and Extension Centre, Mississippi State University.
24. http://www.westerntransportationinstitute.org/documents/reports/4W2643_Final_Report.pdf
25. Aquirre B, Dynes RR, Kendra J, and Connel R. Planning for new hazards: Insights from Hospitals. *Journal of Homeland Security and Emergency Management* 2005; 2: 1-17
26. Sexton KH, Alperin LM, Stobo JD. Lessons from Hurricane Rita: the University of Texas Medical bransch Hospitlat´s evacuation. *Acad Med* 2007; 82: 792-6

27. Gallagher JJ, Jaco M, Marvin J, Herndon DN. Can burn centres evacuate in response to disasters? *J Burn Care Res* 2006; 27: 596-599
28. Auf der Hide E. The importance of evidence-based disaster planning. *Ann Emerg Med* 2005; 47: 34-49
29. Sternberg E. Planning for resilience in hospital internal disaster. *Prehosp Disaster Med* 2003; 18: 291-300

Appendix:

Template one: Check points for hospital evacuation plan. Date:

Key points	Yes	No	Comment
Pre-evacuation			
Evacuation plan? HVA? Other organizations involved? Roles identified? Annual training? Plan for ongoing activities? All risk plan, Infra structural support? Preplanned area for evacuee? Transportation routes inside and outside? Vita functions secured? Medical files and medications?			
Resource and security Staff and resources Remote hospitals Prehospital institutions			
Evacuation (refer to your evacuation plan)			
Decision on evacuation based on evacuation plan Command and control Communication Situation assessment			
Secure all critical functions sensitive equipments e.g. IT, generators Sensitive localizations e.g. assembly areas			
Secure patients safety Medical files, triage, transport Drugs and instruments			
Establish information routs; external and internal			
Contact with external contractors			
Post-evacuation			
Decision on ending the evacuation phase Starting the Recovery and plan to return to normal status Psychological follow-up of patients and staff			
Transport issues			
Coordination Staff Training Referral policy Resources Triage and patient safety			