

# Hospital Evacuation

# Welcome



# Hospital Evacuation

## Agenda

- Welcome – Commissioner Sutton
- Westchester County's HVA & Inundation Maps –
  - OEM Director Mr. Carl Tramontana
- Discussion of Hospital Considerations
  - RRC Director Mr. Garrett Doering
- Break
- OEM & EMS abilities
  - Mr. Jeff Reilly & Mr. Carl Tramontana
- Set next meeting date & handouts



# Hospital Evacuation

## Historical Perspective

There were 275 reported *evacuation* incidents from 1971-1999, with an annual average of 21 in the 1990s, the period for which databases were more reliable. The most, 33, were recorded in 1994, the year of the Northridge Earthquake. Of all incidents, 63 (23%) were attributable primarily to internal fire, followed by internal hazardous materials (HazMat) events (18%), hurricane (14%), human threat (13%), earthquake (9%), external fire (6%), flood (6%), utility failure (5%), and external HazMat (4%).

### CONCLUSION:

More than 50% of the *hospital* evacuations occurred because of hazards originating in the *hospital* facility itself or from human intruders



# Hospital Evacuation

Critical Issues when considering a hospital evacuation:

- Nature of Threat
- Risk to patients
- Risk to staff
- Risk to visitors
- Need for continuing acute care
- Demands for supplies
- Demands for resources



# Hospital Evacuation

## Complicating Factors:

- Unable to model the entire event
  - i.e. “Sniper fire halts hospital evacuation”
- Threats Change over time
- Potential competition for limited resources
- Internal & External Resources Change over time
- Due to complexity, there is limited transferability



# Hospital Evacuation

## Nature of Threat:

- Tornados, earthquakes, HAZ-MAT release, and fires
  - No time to prepare, will result in an “uncontrolled” event
- Hurricanes, floods, or critical infrastructure failure
  - Not immediately life threatening, may result in a “controlled” event

# Hospital Evacuation

Risk to staff, patients & visitors:

- Highly variable depending on event
- Care givers may become involved in the logistics of evacuation:
  - resulting in reduction of patient care
  - staff performing functions they are not familiar with
  - Staff accountability
  - Visitor accountability



# Hospital Evacuation

## Discussion Topics:

- NORMET hospital mutual aid agreement
- HEICS
- Manpower



# Hospital Evacuation

## Discussion Topics:

- Patient Transportation
  - Ambulance
    - Critical Care
    - ALS
    - BLS
  - Ambulette/Wheel Chair Van
  - Passenger Bus
  - Private Car



# Hospital Evacuation

## Discussion Topics:

- Non-patient transportation
  - Staff
  - Equipment
  - Medical Records
  - Pharmaceuticals (esp. controlled substances)

# Hospital Evacuation

## Discussion Topics:

- Internal triage teams
- Internal staging areas
- Loading point(s)
- Bed availability at other facilities
- Notification of patient relatives
  - Handling patient relatives when they arrive
- Securing the hospital



# Hospital Evacuation

## Discussion Topics:

- Special Patient Care Areas
  - OR & Recovery
  - Radiology/MRI/
  - Secure Psychiatric Units
  - L & D, peds
  - ICU/CCU/
  - Vent dependent patients
  - Isolation
  - Prison



# Hospital Evacuation

## Literature Review:

**Benchmarking for hospital evacuation: a critical data collection tool** Schultz CH; Koenig KL; Auf der Heide E; Olson. [Prehospital Disaster Med] 2005 Sep-Oct; Vol. 20 (5), pp. 331-42. **ABSTRACT** Events such as earthquakes or terrorist attacks, hospitals may be victims of disasters. They may need to transfer patients to outside facilities rather than continue to provide on-site care. Following the Northridge earthquake, eight hospitals in the damaged area were the foci of a United States National Science Foundation study that examined the status of the hospitals' pre-event planning, post-event evacuation decision-making, and internal and external evacuation processes. Building on this experience, this paper offers a standardized data collection tool, which will enable researchers to record hospital evacuation information in a systematic manner so that comparable data can be accumulated, evacuation research methods can be improved, and consensus on methods can be reached. The study's principal subjects include: (1) hospital demographics; (2) description of existing disaster response plans; (3) an event's impacts on hospital operations; (4) decision-making and incident command; (5) movement of patients within the facility; (6) movement of patients to off-site institutions; and (7) hospital



# Hospital Evacuation

**Evacuation of a rural community hospital: lessons learned from an unplanned event.** Author(s): [Augustine J](#); [Schoettmer JT](#) Author's Address: Emory University, Department of Emergency Medicine, Atlanta, Georgia 30329, USA. [jaugust@emory.edu](mailto:jaugust@emory.edu) Source: [Disaster management & response : DMR : an official publication of the Emergency Nurses Association](#). [Disaster Manag Response] 2005 Jul-Sep; Vol. 3 (3), pp. 68-72. A credible bomb threat forced the complete **evacuation** of a rural community **hospital**. An Incident Command System was implemented, and all 46 patients were temporarily transported and maintained at 2 local sites. They were returned to the **hospital** approximately 24 hours later. Only one patient experienced a complication possibly associated with the **evacuation**. This article discusses pertinent strategies and considerations involved in the planning and execution of a rural **hospital evacuation**. It further highlights the role of the emergency department medical and nursing staff throughout the **evacuation** process.

**Tragic hotel fires trigger disaster plans: fire forces hospital evacuation.** Author(s): [DiPaolo V](#) Source: [Modern healthcare](#). [Mod Healthc] 1981 Jan; Vol. 11 (1), pp. 18, 22, 26.

**Smooth hospital evacuation in New Brunswick.** Author(s): [O'Brien PE](#) Source: [Emergency planning digest](#). [Emerg Plann Dig] 1979 Jan-Mar; Vol. 6 (1), pp. 7-10.

**Everybody out!** Bowers, Paula J.; Maguire, Margaret Lynn; Silva, Patricia A.; Kitchen, Rhonda Source: [Nursing Management](#), Apr2004, Vol. 35 Issue 4, p50, 4p, 2c Abstract: Provides information on the emergency evacuation system of Texas Medical Center (TMC) in Houston, Texas. Requirements of the Joint Commission on Accreditation of Healthcare Organizations for hospitals' disaster plans; Damages incurred by tropical storm Allison in 2001; Regulations under the TMC evacuation policy.



# Hospital Evacuation

## Interface between *hospital* and fire authorities--a concept for management of incidents in hospitals. Author(s): [Gretenkort P](#); [Harke H](#); [Blazejak J](#); [Pache B](#); [Leledakis G](#) [Prehospital Disaster Med] 2002 Jan-Mar; Vol. 17 (1), pp. 42-7. Although every *hospital* needs a security plan for the support of immobile patients who do not possess autonomous escape capabilities, little information exists to assist in the development of practical patient *evacuation* methods. HYPOTHESIS: 1) In hospitals during disasters, incident leadership of the fire authorities can be supported effectively by *hospital* executives experienced in the management of mass casualties; and 2) As an alternative for canvas carry sheets, rescue drag sheets can be employed for emergency, elevator-independent, patient *evacuation*. METHODS: A *hospital evacuation* exercise was planned and performed to obtain experiences in incident command and to permit calculation of elevator-independent patient transport times. Performance of incident leadership was observed by means of pre-defined checklists. The effectiveness and efficiency of carrying teams with five persons each were compared to those with a rescue drag sheet employed by a single person. RESULTS: Incident command for hospitals during a disaster is enhanced considerably by pre-defined and trained executives who are placed at the immediate disposal of the fire authorities. For elevator-independent patient transport, the rescue drag sheet was superior to conventional carrying measures because of a reduced number of transport personnel required to move each patient. With this method, patient transport times averaged 54 m/min. flat and 18 seconds for one floor descent. CONCLUSION: Experiences from a *hospital* during an *evacuation* exercise provided decision criteria for changes in the disaster preparedness plan. *Hospital* incident leadership was assigned to executives-in-charge in close co-operation with the fire authorities. All beds were equipped with a rescue drag sheet. Both concepts may help to cope with an emergency *evacuation* of a *hospital*.

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# Hospital Evacuation

## Vertical *evacuation* simulation of critically ill patients in a

**hospital.** Author(s): [Gildea JR](#); [Etengoff](#) [Prehospital *Disaster* Med] 2005 Jul-Aug; Vol. 20 (4), pp. 243-8. : The world's new social environment dictates the need for preparedness should a **disaster** occur. One caveat in the realm of **disaster** preparedness is the vertical **evacuation** of **hospital** patients. Little data regarding the **evacuation** of patients are available, and the consequences of not being prepared could be devastating. Therefore, if the vertical **evacuation** of critically ill patients was thrust upon a community **hospital**, the response of emergency services and ancillary staff is largely unknown. METHODS: The vertical **evacuation** of 12 simulated critically ill patients from the fourth floor of a newly constructed and vacant critical care unit was undertaken by local fire fighters, on-staff nursing, residents, and ancillary staff, all under the direction of the **hospital** Emergency Management Committee. Four randomly selected groups of firefighters, two teams consisting of three personnel and two teams of four personnel, were timed and had vital signs assessed prior to ascending to the fourth floor to retrieve a patient and upon each subsequent descent. Each team, dressed in full turnout gear, retrieved three patients. Each simulated patient was fashioned with mock endotracheal tube, intravenous lines, monitor, and a Pleurovac was attached in three of the four patients. Vital signs were analyzed for significant changes or patterns due to exertion and or stress during the drill. Evaluations were distributed to all participants upon completion of the drill. RESULTS: Mean values for the vital signs of the members of each team showed minimal increases from baseline to completion with the exception of heart rate. A decrease in systolic blood pressure was present in both of the four member teams. Subjective evaluation by the firefighters, indicated a "minimal" increase in exertion. Mean extraction time was 14.7 minutes. Patient transfer and **evacuation** was completed without complication to the patients or staff. Only one firefighter requested a replacement. Completed evaluations indicated above average or outstanding performance on organization, commitment, security, and care. Comments included statements regarding equipment management during transport, better communication, stairwell width, difficulty with ventilating intubated patients, improvement of **evacuation** time, and organization as drill progressed; three member teams, spatially, worked better than four. CONCLUSION: This drill reflected an impressive level of preparedness by firefighters, nurses, and ancillary staff both physically and organizationally. Should a vertical **evacuation** of critically ill patients be necessary, a four firefighter extraction team and accompanying nurse and respiratory therapist would be able to evacuate one patient at a rate of 3.75 minutes per floor.



# Hospital Evacuation

## **Vertical *evacuation* drill of an intensive care unit: design, implementation, and evaluation.**

Author(s): [Manion P](#); [Golden IJ](#) [*Disaster Manag Response*] 2004 Jan-Mar; Vol. 2 (1), pp. 14-9. **Abstract:** *Hospital disaster* plans should be developed to cover any potential event that could require the immediate *evacuation* of all patients. Intensive care unit (ICU) patients present multiple challenges for planners: reliability of *hospital* elevators, manpower needed to transport patients, and the time needed for stabilization before patient transfer. If the ICU is located on an upper floor of the *hospital* and patients have numerous life-support interventions in place, a vertical *evacuation* can require more resources than anticipated. A study was done using 12 moulaged patients who were carried down 4 flights of stairs. The lessons learned from the drill are reported.

## **Responding to a fire at a pediatric *hospital*.**

[Hogan C](#) Author's Address: Patient Operative Care Unit, *Hospital* for Sick Children, Toronto. **Source:** [AORN journal](#). [AORN J] 2002 Apr; Vol. 75 (4), pp. 793-800. **Abstract:** *Disaster* preparedness in health care organizations facilitates a formalized response to major incidents or disasters. This article reviews a man-made *disaster*, a fire at a large pediatric *hospital*. How the fire started, patient *evacuation*, redirecting services, timing of events, key players, geographic factors, communications, and recovery and restoration of care are discussed. Lessons learned and Information on *disaster* preparedness also are presented.



# Hospital Evacuation

**Counting crises: US *hospital* evacuations, 1971-1999.** :[Sternberg E](#); [Lee GC](#); [Huard D](#) [Prehospital *Disaster* Med] 2004 Apr-Jun; Vol. 19 (2), pp. 150-7. OBJECTIVES: To investigate the relative distribution of hazards causing *hospital* evacuations, thereby to provide rudimentary risk information for *hospital disaster* planning. METHODS: Cases of *hospital* evacuations were retrieved from newspaper and publication databases and classified according to hazard type, proximate and original cause, duration, and casualties. Both partial and full evacuations were included. The total number of *evacuation* incidents for all hazards were compared to the total number of *hospital* incidents for the one hazard, fire, for which national data is available. RESULTS: There were 275 reported *evacuation* incidents from 1971-1999, with an annual average of 21 in the 1990s, the period for which databases were more reliable. The most, 33, were recorded in 1994, the year of the Northridge Earthquake. Of all incidents, 63 (23%) were attributable primarily to internal fire, followed by internal hazardous materials (HazMat) events (18%), hurricane (14%), human threat (13%), earthquake (9%), external fire (6%), flood (6%), utility failure (5%), and external HazMat (4%). CONCLUSIONS: More than 50% of the *hospital* evacuations occurred because of hazards originating in the *hospital* facility itself or from human intruders. While natural disasters were not the preponderant causes of evacuations, they caused severe problems when multiple hospitals in the same urban area were incapacitated simultaneously. Clearly, as hospitals are vulnerable to many hazards, mitigation investments should be assessed not in terms of single-hazard risk-cost-benefit analysis, but in terms of capacity to mitigate multiple hazards. In view of the many qualifications and limitations of the dataset used here, but value of such data for *disaster* planning, hospitals should be asked to submit standardized incident reports to permit national data gathering on major disruptions.



# Hospital Evacuation

*Hospital* evacuations due to hazardous materials incidents. [Burgess JL](#) [Am J Emerg Med] 1999 Jan; Vol. 17 (1), pp. 50-2. **Abstract:**In a previous study 12 Washington State hospitals reported evacuations due to hazardous materials incidents. A telephone survey was conducted to further describe these incidents. Ten hospitals responded to the survey, including one institution reporting two incidents. The incidents included threatened explosions or releases in three cases and actual chemical exposures in eight cases. The actual exposures included irritant gases from mixtures of cleaners in two cases, an unknown exposure in one case, and a variety of other chemicals or products in the remaining cases. Seven of the 11 incidents resulted in emergency department (ED) **evacuation**. Two incidents involved secondary contamination of ED staff from treatment of patients with chemical exposures who were not decontaminated prior to arrival. Fire department personnel assisted in the majority of incidents. Review of these cases provides useful information for planning drills to test emergency preparedness as required under Joint Commission on Accreditation of Healthcare Organizations standards.

*Hospital* mutual aid **evacuation** plan. [Phillips R](#) [Healthc Facil Manag Ser] 1997 Feb, pp. 1-23. **Abstract:** Health care facilities need to be prepared for disasters such as floods, tornadoes and earthquakes. Rochester, NY, and its surrounding communities devised a **hospital** mutual aid **evacuation** plan in the event a **disaster** occurs and also to comply with the Joint Commission. This document discusses the plan's development process and also provides the end result.

*Evacuation* of patients during a fire at a general *hospital*. [Blumhagen DW](#) [Ann Emerg Med] 1987 Feb; Vol. 16 (2), pp. 209-14. **Abstract:**The epidemiology of **hospital** fires is described briefly, followed by a case report of the **evacuation** of 150 patients from a general **hospital** during a fire. A theoretical framework for the analysis and management of such situations is developed and illustrated. The need for flexibility in the development of **disaster** plans, the need to simplify plans and reduce the number of staff involved, the need to tailor plans to meet the demands of specific situations, and the need for immediate planning to reopen the facility are stressed. The development of "fire-safe" elevators to assist the **evacuation** of most patients is particularly important to future **hospital** design.

