



Medical Evacuation Triggers

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KEY POINTS

Types of Evacuations

Evacuations are required when hospital operations have been or are in immediate danger of being compromised negatively affecting patient care. In addition when there are structural integrity issues or electrical hazards that threaten the safety of patients and staff, evacuations are necessary. Evacuations occur in 3 different categories: Horizontal, Vertical or Complete. Complete evacuations should be considered only as a last resort as patient morbidity has been shown to rise in evacuations for example in Japan after the Fukushima Disaster mortality hazard ratio increased to 2.28 for evacuees. (Nomura S, Gilmour S, Tsubokura M, Yoneoka D, Sugimoto A et al (2013) Mortality Risk amongst Nursing Home Residents Evacuated after the Fukushima Nuclear Accident: A Retrospective Cohort Study. PLoS ONE 8(3): e60192.doi:10.1371/journal.pone.0060192). Vertical evacuation would mean shifting patients from 1 floor to another and this can be challenging especially when elevators are not available. Here the trigger threshold is high and it must be absolutely essential for patient/staff safety to begin a vertical evacuation. Horizontal evacuation would mean shifting one department and its patients to another area in the same floor. This is most likely during small localized events and can be done rather easily and its trigger threshold can be low.

Triggers to Evacuate

Loss of important environmental and physical safety as well as disruption of vital medical resources could trigger evacuation. These include, potable water, steam, electricity and especially disruption of life sustaining electrical equipment. Triggers for evacuation include the above mentioned and specific threats to certain clinical units as described in the chart below.

Specific Adverse Clinical Outcomes in Emergency Medical Evacuation to Consider

Airlifting of patients creates not only a logistical challenge but physiologically patients transported by air who are already in critical condition will suffer potential altitude pressure related effects. These include but are not limited to decreased atmospheric pressure in helicopters causing distention of intraluminal gases leading to high probability of paralytic ileus leading to potential vomiting and aspiration for example. Also specific equipment such as ventilators, intra aortic balloon pumps and thoracostomy drains need to be attended to by accompanying staff and are at risk of being damaged in transit.

EVACUATION MATRIX

	Threshold for Horizontal Evacuation	Threshold for Vertical Evacuation	Threshold for Complete Evacuation	Is Shelter in Place Viable Option?	Special Considerations and Priority
Neonatal ICU Medical ICU Surgical ICU Cardiac Care Unit Pediatric ICU	Disruption to electrical life sustaining equipment, localized non volatile chemical release. contained fire,	Disruption to electrical life sustaining equipment, localized structural integrity compromise, volatile chemical release, Biological agent release, contained fire that threatens continuity if operations	Disruption to electrical life sustaining equipment including back up power, Structure integrity, Compromise to medical supplies, Electrical hazards, Complete loss of medical gas, potable water, Volatile gas release Biological agent release	Only if back up electrical supply is available for life sustaining equipment. Shelter in place would be advisable if security concerns threaten both internal transport to staging area and/or off site transport. Also depends on time of arriving threat	Generally, these patients are reserved for last to ensure they can have access to hospital equipment for the most time and first to leave the staging area to reduce time in transit. In addition staff freed from non critical patients can assist
General Medical, Surgical Ward Rehab Ward General Pediatric Ward	Disruption to electrical life sustaining equipment, localized non volatile chemical release. contained fire,	Disruption to electrical life sustaining equipment, localized structural integrity compromise, volatile chemical release, Biological agent release, contained fire that threatens continuity if operations Environmental systems failure, including plumbing	Disruption to electrical life sustaining equipment including back up power, Structure integrity, Compromise to medical supplies, Electrical hazards, Complete loss of medical gas, potable water, Volatile gas release. Biological agent release	Yes, Shelter in place would be advisable if security concerns threaten both internal transport to staging area and/or off site transport. Also depends on time of arriving threat	These patients are always evacuated first starting with patients that are in immediate danger

Special Considerations and Priority

Labor and Delivery

Patient is active labor need to deliver ,prior to evacuation if safe. Patient's who are in active labor who are unstable and might need emergent C-section are prioritized first for transfer and need to have physician to accompany them with appropriate medications and fetal monitors.

Burn Unit

Patients should be reserved for last as to ensure they can have access to hospital equipment for the most time and first to leave the staging area to reduce time in transit. In addition staff freed from non critical patients can assist. Special consideration has to be made for transport of patients in which friction of any kind could adversely disrupt integrity of skin grafts or occlusive dressings

Psychiatric Unit

Patients need to be put in separate staging area/ Assembly points for evacuation. PRN agitation injectable drugs with appropriate staff to help patients with the reduction of stimuli need to accompany evacuees
