

Report from the Field




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Pagers Explosion: Challenges of the Emergency Preparedness Plan

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Abstract

On September 17, 2024, an unforeseen attack due to the Pagers Explosion targeting a military party in Lebanon left more than 2750 casualties. A total of 38 injured patients presented to the Lebanese American University Medical Center-Rizk Hospital (LAUMC-RH), a private university hospital. Most injuries were amputated fingers and eye injuries. Intensive training and regular drills are conducted at the hospital level to ensure readiness. This report highlights major challenges that were encountered during this explosion and provides possible strategies to overcome them.

On September 17, 2024, the communication devices of a military party in Lebanon dramatically exploded simultaneously at 15:30. This attack was an unprecedented security breach. Following this detonation, an influx of injured started to reach nearby hospitals, in particular the Lebanese American University Medical Center-Rizk Hospital (LAUMC-RH), a private teaching university hospital located in the capital Beirut.

A total of 38 injured patients presented to the Emergency Department (ED), 37 were triaged red on arrival and only 1 green. Among the 37 casualties, 33 required surgical interventions, mainly ophthalmological and orthopedic surgery.

Following the Beirut blast of August 4, 2020, the hospital revised and updated the emergency preparedness plan (EPP) then conducted extensive training for its staff and concrete drills. Despite all these mitigation measures, numerous challenges were also encountered on that night. This report aims to highlight these barriers in order to provide interventions and strategies to overcome the obstacles. The ED accommodates 16 stretchers. When a sudden onset disaster mass casualty incident (MCI) occurs, triage is conducted outside by 2 registered nurses, and patients are sorted as walking or non-walking. Walking patients are diverted to the green zone, located in the hospital clinics. The ED becomes the red zone where the critical patients are assessed and managed.

On the afternoon of September 17, physicians were home, clinics were closed, and there was 1 ED physician, 2 residents, 5 nurses, and 3 practical nurses in the ED. An activation message “EPP Code White: come to the hospital immediately” was sent by the operator at 15:45 to all the medical personnel to head to the hospital immediately. Evacuation was done to all the ED cases already present (n =). In less than 30 minutes, the ED was overwhelmed with casualties in a crowded bloody scene. Almost all the injuries affected the upper extremities and the face, requiring imminent ophthalmologic and orthopedic assessment.¹

Discussion

Triage

The triage nurse was located in the parking area near the main gate to ensure that casualties were sent to the right zone as fast as possible. Using the ED triage kit, detailed in [Table 1](#), each patient was identified through an EPP number written electronically on a card attached to the chest or neck, as in [Figure 1](#). Re-triage was conducted in the red zone.

In this particular MCI, all the cases except 1 were red, limiting the space and the capacity of the care ([Figure 2](#)). The influx was massive and overwhelming due to the severity of the cases. At a specific point in time, the triage nurse was needed to help in the red zone because of the paucity of human resources there. And the triage zone was left to a practical nurse and a medical student.

To maximize the benefits of the prioritization of casualties in MCIs, an efficient priority-oriented triage is crucial and done without the aid of diagnostic equipment. A mass casualty triage

Table 1. Triage kit

Triage Kit
Colored rubber wristbands
Stickers Red/ Green/ Black
Tracking forms
Plastic bag containing:
-MCM clinical forms
-EPP number
-Patient identification labels
-Bag for belongings

is a dynamic phase with a continuum of care where reassessment is often needed.² Triage training and functional exercises can aid in refining the triage system in coordination with the prehospital resources.

Identification of Patients

The vast majority of patients were transported by the Lebanese Red Cross and accompanied by their families. In the triage zone outside the ED, patient identification started by attributing a number to each injury.

This casualty was peculiar because the facial injuries made the casualties unrecognizable. However, the main obstacle to proper patient identification was the resistance to reveal their authentic name, these patients being anonymous and secretly enrolled in the military party. On the other hand, because the injuries involved the upper extremities, it was challenging to apply color bracelets to orient the patients to their assigned zones. Even colored stickers could not be placed because of the moist skin.

A practical way to overcome these issues is to be flexible and innovative in facing each casualty on an individual basis. For instance, it was possible to attach the clinical form around the neck documenting the management plan and updating the results with the disposition.

Because patient identification is considered the cornerstone of proper care and tracking, many studies incorporated inventive approaches, such as smartphone-based applications to register and update the clinical status of the patient in real time.³

Operation Rooms (OR)

On that night, there was an inordinate demand to tackle the ophthalmologic, maxillofacial, and orthopedic injuries. All 33 patients needed the OR, and as a result, the 8 available operating rooms were overwhelmed. Therefore, it was pivotal to prioritize injuries according to their salvageability. This forced the medical staff to create a team of anesthesia, orthopedic as well as ophthalmology residents to evaluate every patient and organize surgeries according to the urgency of each case.

Imaging

LAUMC-RH disaster plan stipulates performing diagnostic imaging for the red zone patients inside the ED and transporting

the green cases to the radiological department. However, the imaging need was unforeseen and could not fulfill the urgent demand, since all the patients needed at least a computerized axial tomography (CAT) scan of the brain, face, and the upper extremities before an operation. The Radiology Department adapted to the formidable demand by allocating the scan that is located inside the ED for all the critical patients who were prioritized to the OR, and the scan located inside the radiology department for the cases that were less critical or sorted to have delayed surgery. Therefore, medical assistance was required during transportation outside the ED. This underlines the importance of optimizing imaging protocols to achieve maximal efficiency during an MCI and is an absolute key point in prioritizing urgency for imaging.

Chaos

The chaos of unpredictable formless movement of the dynamic environment was unpreventable. The arriving casualties added to the casualties who had already arrived, and soon after their families exponentially increased the density of the emotional surge, as anxiety and fear made the ED a crowded space. Usually, families are not allowed to enter the red zone. However, in this specific incident, there was a communication barrier because the people targeted were from a military party hiding their identities and imposing their own expectations. Many relatives went inside the ED, moving freely without taking permission.

Managing the chaos of an MCI can be controlled with the organization of the 5 "S": "Scene safety assessment, Scene size-up, Send information, Scene set-up, and START (Simple Triage and Rapid Treatment)".⁴ Another obstacle hindering appropriate care was the presence of many nursing and medical students who came to help but incrementally oversaturated the red zone. Usually, the EPP dedicates students to patients in the green zone. In the future, their role shall be more defined in the plan.

Transfer

Soon after the EPP code was clear, the hospital had to face another challenge and casualties were transferred from other hospitals for continuity of care. The influx was oppressive and seemed to be random respect the hospital transfer policy. WHO had to divert around twenty ambulances to other hospitals due to lack of OR space. Better transfer coordination is paramount to improving morbidity and mortality.

Conclusion

The Pager Bombing attack was one of the biggest security breaches in history, wounding more than 2750 casualties.⁵ Wounded with lost hands, disfigured faces, crushed legs, and lost eyes rushed to the LAUMC-RH ED. Major challenges were faced with kudos to those who made decisions during the MCI response. These decisions will contribute to the analysis during recovery to improve the EPP. MCIs are never the same, and no EPP can be created to accommodate all-hazards. EPPs can follow the major rules, but adaptation and improvisation are needed in an MCI response.

LAU Medical Center
 المركز الطبي للجامعة اللبنانية - الجامعة اللبنانية
 Lebanese American University Medical Center - Risk Hospital

MCM CLINICAL CARE FORM

Patient's Name: [Redacted]

EPP 14

gunshot wound
 stab wound
 laceration
 crush injury
 blunt trauma
 burn
 chemical exposure

LOCATION OF INJURY

infant
 Time
 Pulse
 BP
 RR
 SaO₂
 Pain

INTERVENTIONS

C	Tourniquet Time _____	Left Arm <input type="checkbox"/>	Right Arm <input type="checkbox"/>	Left Leg <input type="checkbox"/>	Right Leg <input type="checkbox"/>
	Dressing:	Pressure dressing <input type="checkbox"/>	Haemostatic agent <input type="checkbox"/>		
A	Nasopharyngeal airway <input type="checkbox"/>	ET Tube <input type="checkbox"/>	Supraglottic device <input type="checkbox"/>		
B	Needle decompression <input type="checkbox"/>	Chest Tube <input type="checkbox"/>			
C	IV Line <input type="checkbox"/>	Fracture Splinting <input type="checkbox"/>		Pelvic Binder <input type="checkbox"/>	

	Name	Dose/Volume	Route	Time
MEDS	Smy Morphin			
FLUIDS	Tetacyclam			
BLOOD	Augmentin	Tetacyclam	Augmentin	

IMAGING
 CT Brain CT Neck
 (Circled in red)

STEP 2 TRIAGE
 Red Yellow Green Black

DESTINATION
 OT ICU Ward Green zone Referral Mortuary

NOTES
 (Circled in red) **Urgent** **CT Neck**
 (Circled in blue) **Urgent** **CT Neck**

CLINICIAN SIGNATURE: _____ CLINICIAN NAME: _____

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Figure 1. Clinical care form.

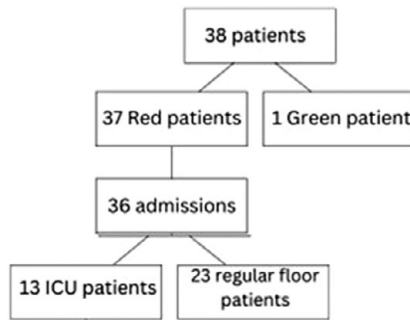


Figure 2 Patients' distribution.

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References

1. Helou M, El Osta N, Weinstein E. Beirut explosion: challenge of hospital emergency preparedness. *Disaster Med Public Health Prep.* 2022; **16**(6):2419–2421. doi: <https://doi.org/10.1017/dmp.2022.115>
2. Cuthbertson J, Weinstein E, Franc J et al. Sudden-onset disaster mass-casualty incident response: a modified Delphi study on triage, prehospital life support, and processes. *Prehosp. Disaster Med.* 2023; **38**(5):570–580. doi: [10.1017/S1049023X23006337](https://doi.org/10.1017/S1049023X23006337). Epub 2023 Sep.
3. Po-Liang Cheng, Yung-Cheng Su, Chung-Hung Hou, et al. Management of in-field patient tracking and triage by using near-field communication in mass casualty incidents. *Stud Health Technol Inform.* 2017;**245**:1214
4. De Nolf R, Kahwaji C; EMS Mass Casualty Management; StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan. 2022 Oct 10. PMID: 29493995 Bookshelf ID: NBK482373.
5. Hezbollah is hit by a wave of exploding pagers that killed at least 9 people and injured thousands; Hezbollah hit by exploding pagers in Lebanon and Syria: At least 9 dead, thousands injured | AP News Accessed September 19, 2024