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Three Activations, One Plan: Evolving Emergency Preparedness Through Recurrent Sudden-Onset Disasters in Beirut, Lebanon

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Abstract

On April 8, 2026, a series of large-scale airstrikes struck Lebanon, killing at least 254 people and injuring 1,165 others. The Lebanese American University Medical Center–Rizk Hospital, located in central Beirut, received 2 distinct waves of casualties totaling 42 patients: 28 red, 9 green, and 5 deceased. This report describes the hospital's emergency preparedness plan (EPP) response and examines challenges encountered across 3 sequential mass casualty incidents at the same institution: the Beirut Port Explosion (2020), the Pager Explosion (2024), and the April 2026 airstrikes. Each prior activation was formally debriefed, and its lessons incorporated into successive EPP revisions. The April 8 response exposed persistent and newly identified vulnerabilities: unassigned trainees accumulating in the red zone, premature code deactivation prior to a second casualty wave, surgical resident resource constraints, and the absence of a regional interfacility transfer network. Iterative debriefing and plan revision can produce an evolving EPP.

Introduction

On April 8, 2026, at 2:16 pm, a series of large-scale airstrikes marked the deadliest attack on Lebanon since the war began, killing at least 254 people and injuring 1,165 others, according to Lebanon's Civil Defense, as multiple areas, including central Beirut, the Bekaa Valley, and southern regions, were struck.[1,2] More than 100 airstrikes hit these areas within 10 minutes, flattening buildings in densely populated neighborhoods and overwhelming emergency services.

The Lebanese American University Medical Center–Rizk Hospital (LAUMC-RH) is a private teaching university hospital with 120 beds and an Emergency Department (ED) of 17 beds, located in central Beirut. The April 8 event represents the third time LAUMC-RH has activated its EPP in response to a sudden-onset Mass Casualty Incident (MCI) since 2020. The 2 prior activations, the Beirut Port Explosion on August 4, 2020,[3] and the Pager Explosions on September 17, 2024[4], each generated critical lessons that were formally debriefed, documented, and incorporated into successive revisions of the EPP. This report describes the hospital's response to the April 8 airstrikes and examines its challenges within the context of this institutional learning trajectory.

A Disaster Committee (DC) at LAUMC-RH, led by the Chief Medical Officer, meets regularly with relevant departments, conducts risk assessments, and maintains the EPP, which is updated after each MCI activation and reinforced through annual drills. The EPP designates the ED as the red zone for critical patients and redirects green-tagged patients to the hospital's outpatient clinics. Triage is conducted outside the ED, with patients sorted as walking or non-walking. Color-coded jackets identify staff roles, and a unique EPP number is assigned to each patient at triage and later is formally registered.

Narrative

Disaster Response

When the airstrikes occurred, one explosion was close enough to the hospital that fumes were visible from its windows. The EPP code was activated immediately, and at 2:26 pm, a text message was dispatched by the operator to all hospital staff and physicians. At the time of activation, the ED was staffed by 1 attending ED physician, 4 ED residents, 1 clinical pharmacist, 5 registered nurses, 2 practical nurses, 2 transporters, and 1 admission officer, with 2 critical patients, 1 adult and 1 child, already in the department.

Consistent with experience gained during the 2020 blast[3] and the 2024 pager explosion,[4] formal vital-sign-based triage as stipulated by standard MCI methodologies was again deemed

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impractical in the acute phase. Patients were instead assessed and sorted outside the ED as walking or non-walking, or deceased. Within ten minutes, the first wave of injured presented: 5 red-tagged (immediate), 4 green-tagged (can wait), and 2 black (deceased). All red patients required urgent operative intervention. The code was cleared at 4:04 pm.

A second wave of casualties began presenting at 5:00 pm, predominantly transfers from saturated neighboring hospitals, the majority of whom were red-tagged and required intensive care unit (ICU)-level care or operative intervention. In total, LAUMC-RH received 42 patients that night: 28 red, 9 green, and 5 deceased. Among the red patients, 19 were admitted, 15 to the floor, 2 to the intensive care unit, and 2 to the pediatric intensive care unit. Ten patients underwent operative procedures.

Discussion

Triage

The inability to perform formal vital-sign assessment during the acute triage phase has been a consistent finding across all three LAUMC-RH MCI activations. During the 2020 Beirut blast, the volume of casualties rendered Simple Triage and Rapid Treatment (START) triage-based vital sign assessment practically impossible, prompting a shift to a binary ambulatory versus non-ambulatory sorting approach.[3] This adaptation was retained and formalized in subsequent EPP revisions. The 2024 pager explosion reinforced this finding: with 37 of 38 patients triaged red on arrival, even the binary sort was strained, ultimately requiring the triage nurse to relocate to the red zone to address critical staffing shortfalls.[4] On April 8, the same approach was applied from the outset, reflecting its now-established status within the EPP rather than an improvised deviation from it. The DC's decision to codify this practice represents a pragmatic acknowledgment of the gap between triage doctrine and operational reality in sudden-onset high-volume MCIs.

Crowd Control and Chaos Management

Uncontrolled crowding within the ED was among the most destabilizing challenges identified in 2020, when families, unassigned residents, and medical students converged in the red zone, making role identification and communication nearly impossible.[3] In response, the DC introduced colored jackets to delineate staff roles and tasked security personnel with restricting ED access, with families redirected to a designated family area managed by a dedicated staff member. These measures were partially effective during the 2024 activation, though military-affiliated casualties presented a novel obstacle: family members insisted on entering the red zone and could not be deterred by security, reflecting the limitations of any crowd management protocol when confronted with non-conventional social dynamics.[4]

On April 8, security control at the ED perimeter was demonstrably improved over prior activations. Families were successfully contained in the designated area, and a staff liaison was assigned to provide updates. However, a persistent challenge re-emerged: unassigned residents and medical students continued to accumulate in the red zone through the ED back entrance, compounding communication difficulties and adding unnecessary cognitive load on active clinical staff. The interim solution, redirecting residents to the floors to assess admitted patients, was effective but ad hoc. The DC has since identified the need for pre-assigned roles for trainees within the EPP, including a dedicated colored jacket designation for students, to convert an ongoing liability into a structured resource.

Operative Capacity and Surgical Resources

Surgical resource constraint emerged as a critical theme across all three activations. During the 2020 blast, 58 of 408 patients required operative intervention, which exceeded operating room (OR) capacity and required rapid prioritization.[3] The 2024 pager explosion presented a more acute surgical crisis: 33 of 38 patients required OR access, overwhelming all 8 available operating rooms and necessitating real-time prioritization by a multidisciplinary team of anesthesia, orthopedic, and ophthalmology residents.[4] A key EPP revision following 2024 established clearer OR coordination protocols between the ED and surgical teams. On April 8, this coordination functioned effectively during the first wave, with 10 operative cases managed without the disorganization seen in prior events. The second wave, however, exposed the limits of surgical resident availability: the majority of second-wave patients were red-tagged and required ICU-level of care admission and/or operative intervention, exposing the limited number of surgical residents as a critical resource constraint that the EPP had not yet fully addressed.

Interfacility Transfer and Hospital Network Coordination

The absence of a functioning interfacility transfer network has been identified as a structural gap since the 2020 blast, when 2 nearby hospitals became nonfunctional and transfer was impossible, leaving LAUMC-RH to absorb casualties without the relief of diversion.[3] This prompted the DC to advocate for a regional hospital network capable of real-time capacity sharing. During the 2024 activation, the Ministry of Health diverted approximately 20 ambulances away from LAUMC-RH due to OR saturation, evidence of emerging coordination capacity, though the process remained reactive rather than systematic.[4] On April 8, saturation of nearby hospitals rendered outbound transfer impossible once again.

Code Deactivation Protocol

The premature deactivation of the EPP code on April 8 represents a newly identified vulnerability with no direct precedent in the 2 prior activations. The decision to clear the code at 4:04 pm was based on Ministry of Health information indicating no further casualties at the scene; however, this did not account for the pending transfer burden from saturated neighboring hospitals. Essential clinical staff departed before the second wave arrived, leaving a partially depopulated ED to receive critically injured patients. The DC has identified the need for a structured deactivation protocol requiring real-time situational awareness from the broader hospital network before staff are released. This gap further underscores the urgency of establishing a regional MCI coordination infrastructure, the absence of which has now contributed to adverse operational outcomes across multiple activations.

The Disaster Committee: Debrief, Appraisal, and Plan Evolution

The capacity of LAUMC-RH to respond more effectively to each successive MCI is not incidental. It reflects a deliberate institutional process anchored in the DC's post-event debrief and critical appraisal cycle. Following the 2020 blast and the 2024 pager explosions, the DC identified improvements that were incorporated into the EPP prior to the April 8 plan activation. This activation generated a new debrief agenda: formalizing trainee role assignments within the EPP, developing a structured code deactivation protocol tied to network-wide situational awareness, addressing surgical resident resource allocation for protracted multi-wave events, and renewing advocacy for a regional hospital coordination system.

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Conclusion

This iterative cycle, activation, debrief, critical appraisal, revision, drill, constitutes a replicable model for EPP development in hospitals operating in high-frequency disaster environments. Its value lies not in producing a plan that anticipates every contingency, but in building an institution capable of learning faster than disasters recur. In a country where that interval has proven to be measured in months, the speed and rigor of that cycle may matter as much as the plan itself.

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