

in emergency planning for large numbers of civilian casualties. Recent experiences have emphasized the need for interdisciplinary planning and synchronized management strategies and protocols. Germany will host the World Soccer Cup in 2006, and Munich will be hosting several games for this event. Therefore, it is necessary to reevaluate the current system for dealing with mass casualties.

Methods: As the basis for the planning, a critical path model for the management of a multiple-casualty incident using evidence-based medicine was developed. The starting point is the first unit on-scene and the finishing point is the stabilization of all patients in a hospital facility or the discharge of those not requiring treatment. Triage Category 1 patients was defined as having a zero buffer time, and therefore determining the critical path in the chain. The critical path model has been transformed into a management algorithm and encompasses medical, as well as logistical procedures.

To test the viability of this model, exercises are being conducted and evaluated continuously. In parallel, hard data are being collected, giving values to amounts of resources and times of procedures needed in a computational model.

Results: The creation of an interdisciplinary algorithm has greatly enhanced the ability to work with other emergency management services and facilitators to achieve a synchronized emergency management matrix. All personnel involved in responding to such an incident have a clear understanding of their role, priorities, and dependencies.

Discussion: A more structured approach to planning and dealing with mass-casualty incidents has been the topic of many publications and conferences, and theoretical and empirical planning methods have proven ineffective. Integrating knowledge and practices from other management fields into emergency medical management will prove beneficial. The frequency of incidents involving multiple casualties is increasing and valid planning methods will become an integral part of risk management for governments and authorities.

Keywords: exercises; Germany; mass-casualty incidents; models; Munich; planning

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Tiered, Multi-Hospital Response and Joint Triage for Disaster: A Model for Resource Allocation and Surge Capacity

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Objectives: In city-wide disasters, multiple hospitals are stressed and inundated by patients, some of which have needs not routinely provided by an individual facility. Redistribution and triage of patients in a coordinated response to disasters can utilize the unique services of each hospital, while lessening the burden on any one facility. Having a city hospital, such as Kings County Hospital Center (KCHC) across the street from a state-run, tertiary care facility, such as the University Hospital of Brooklyn, is common in large urban centers. A rehabilitation nursing home and a state psychiatric facility also are located within

a radius of one kilometer. A disaster response to mass-casualty incidents was developed incorporating all of these facilities, demonstrating that it is possible to minimize duplication of services in order to provide efficient use of resources. In subsequent drills, it became apparent that a full response was neither efficient nor cost-effective for all scenarios. A graded response system was developed to prevent under- or over-utilization of resources. In this tiered system, with each level of escalation, additional surgical teams, directors, and hospital emergency incident command system (HEICS) personnel are activated.

Methods: An emergency preparedness liaison was appointed to each hospital to integrate these plans into a joint multi-hospital disaster response. The police and fire departments along with the Office of Emergency Management were integrated into this project. The following graded response plan was developed: Level I and Level II are limited responses for circumstances in which the number of casualties expected are no more than 10, or 10–30 critical victims presenting over a 1–2 hour period, respectively. As KCHC is the regional Level 1 trauma center, the first two levels of response are contained within the KCHC HEICS. A Level III center is utilized when the number of casualties are expected to exceed 30 critically injured, requiring hospital-wide disaster plans for all facilities. Integration of rehabilitation and nursing home facilities into the plan allows the trauma center (KCHC) to free up isolation beds in case of a biological disaster. Ventilated patients can be reassigned to the extended care facilities at the discretion of hospital medical officers as need arises. Families and associates are directed to the psychiatric facility where counselors are available for assistance.

Results: Disaster drills of this graded response system showed improvements in triage, tracking, treatment, and surge capacity. All city, state, and federal agencies reacted favorably to the joint hospital project, changing traffic patterns to facilitate a unified triage system between multiple hospitals.

Conclusion: It was found that interhospital and interdepartmental cooperation in disaster management is possible and beneficial to rapid, organized, and efficient resource allocation.

Keywords: cooperation; disaster management; graded response system; hospital; response; triage

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How Can Information and Communications Technology (ICT) Improve Coordination and Control in Disaster Response?

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Introduction: Successful coordination and control depends on all parties having access to up-to-date information. Current approaches are based mostly on verbal communication (by phone/radio), and by the exchange of written forms. Experience has shown that these methods often are inadequate. The use of information and communications technology (ICT) offers great potential in providing a common, up-to-date picture of the situation. But this