Development of a Triage Protocol for Critical Care During an Influenza Pandemic
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Reviewed by Nancy M. Gillium

PURPOSE: To develop a triage protocol to ensure that there is equitable and efficient use of critical resources such as ventilators and antiviral medications, in a time of an influenza pandemic in humans.

METHODS: An expert panel with critical care experience was brought together to use best practice evidence in developing a triage protocol for prioritizing access to critical care resources. The group consisted of specialized clinicians in infectious disease, medical ethics, military medicine, triage and disaster management. The group began an in-depth review of research using medical literature through MEDLINE from 1966 through to 2004, which included disaster literature, military protocols and published pandemic plans. A final report was distributed to 150 critical care leaders for comments. The responses were incorporated into a document for use in critical care triage protocols.

RESULTS: There were many triage protocols identified for trauma, chemical, biological and nuclear events, but the research failed to identify any general research protocols specifically for critical care. The working group began to develop a critical care triage protocol with features from other protocols that appeared useful, such as use of a color-coded triage tool, inclusion and exclusion criteria, and minimum qualifications for survival. It was determined that the most appropriate scoring system was the Sequential Organ Failure Assessment (SOFA) because it covers a wide variety of conditions requiring critical care. The protocol that was developed has four main components: (1) inclusion criteria; (2) exclusion criteria; (3) minimum qualifications for survival; and (4) prioritization. It was designed to function as a guideline for decision-making during the initial time period of an influenza pandemic if the critical care system was overwhelmed. The goal of the protocol was to maximize the treatment benefits for the largest number of patients presenting to an overwhelmed critical care system. The authors suggest that the protocol be tested well before an influenza pandemic occurs so that it can be modified and refined. They believe that the use of such a protocol to triage critical care patients will be useful in any disaster situation where critical care resources are scarce.

COMMENT: With the ongoing discussion and concerns of the avian influenza (H5N1) there should be apprehension when realizing few healthcare institutions have a protocol in place for the triage of critical care patients. In addition, few of the existing plans have been tested systematically. For such a plan to be successful and a facility to be prepared, it must be evaluated rigorously in order to identify the weak points and allow time for corrections. The team that developed the protocol for critical care was well represented by several stakeholders, including representatives with expertise in medical ethics. During a time of crisis patients likely will not receive the same healthcare as they would under normal circumstance. Use of a protocol may allow for appropriate triaging of all patients so that critical care resources will be expended on those whom it may be most beneficial.

Many nations have dealt with pandemic situations and have appropriate plans and protocols in place. The culture of the American healthcare industry continues to be denial in the face of a potential pandemic situation and therefore, is lacking the necessary responses. Due to increasing public awareness, influenza pandemic drills are being scheduled in many communities. Outcomes of these drills likely will emphasize the lack of appropriate plans and trigger the development of such protocols as described in this article.

Prehospital Emergency Care and Medical Preparedness for the 2005 World Championship Games in Athletics in Helsinki
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Reviewed by James Cotton

PURPOSE: To determine the state of medical preparedness and emergency care, as well as to examine the charac-
characteristics of patients requiring ambulance services and pre-hospital resource utilization during the 2005 World Championship Games in Helsinki, Finland.

**METHODS:** This was a prospective, observational study conducted by the Helsinki Emergency Medical Services (EMS). Using special data collection forms, information about all emergency calls at the sports venues and Games village for the 10 days of the games was gathered. Information from any persons treated by EMS was amassed and evaluated as well. Data from the organizations responsible for the health care and first aid of spectators and accredited persons (e.g., athletes, coaches, the press, very important persons, and personnel working in the games area) also were collected. Data were analyzed using Kendall’s and Chi Square tests to determine significant associations.

**RESULTS:** A total of 479,000 people were present at the 2005 Helsinki Games; this was 72% less than the number anticipated, and was attributed partly to poor weather conditions during several days of the Games. Data from the ambulance calls at the Olympic Stadium and the Games village indicated that there were 0.7 calls per 10,000 individuals. It was necessary for 25 patients to be transported to a hospital via ambulance (0.52 per 10,000), and no one needed on-site, emergency, life-saving procedures, such as cardiopulmonary resuscitation. A total of 1,586 individuals needed medical care. Of this number, 554 spectators were provided with some form of first aid. Based on the data, the authors conclude that EMS services were sufficient. However, they found that ambulance response times were sub-optimal emphasizing the need for "strategic" placement of first-aid providers. Surprisingly, ambulance calls in the Helsinki increased by 5.9% compared to prior years, while the number of actual emergency department visits was unchanged. A disaster plan for the Games was created based on a hazard vulnerability analysis and the possibility of a chemical, biological, radiological or nuclear incident. The authors suggest that these plans were sufficient. Based on the data from this observational study, they suggest that the planning process should begin well in advance of large scale mass gatherings. They emphasize that a clear command structure must be established, along with risk analysis and coordination with local authorities. Finally, the authors point out the importance of predefined tasks and performance coordination of EMS.

**COMMENT:** Major sporting events, such as the World Championship Games held in Helsinki, and those to the magnitude of Olympic Games this summer in Beijing, place medical care and public safety at the forefront. More than two million visitors are expected for the Beijing Olympics, and even a miniscule influx of required medical care beyond the expected, will severely strain the emergency medical services system.

The need for planning is instrumental in events of this magnitude. Responsibility must be determined well in advance of the scheduled events. The responsibilities of medical care vary as was discussed in detail within this study. The structure was divided into: first aid of accredited persons, first aid of spectators, and emergency care of the accredited persons and spectators. The initiation of responsibilities will be determined on the organization. The authors state that much of the medical care was the full responsibility of the Games organizer. Different volunteer services set up to handle the general medical services, each within their own entity, simplified their command center and communication. EMS was the only service contracted to handle ambulance responses, in addition to coordination with local police and hospitals. Using the local EMS impacts local communities. The impact on the community will be determined by the number of local visitors, sports participants, sports staff and pre-determined risk. During this event in Helsinki, separating the services and having EMS only handle emergency transports significantly reduced the impact on the local community. Only one additional EMS transport was scheduled during the events, but was not required. Prior to the Helsinki Games, the need for medical care at mass gatherings was well-researched. Onsite first aid was instrumental in managing the everyday occurrences. These first aid stations were manned by volunteers, which substanitally decreased the fiscal requirements of the organizer. Even though the EMS usage was under-anticipated, it easily could have been in excess of anticipated. The success of these plans emphasizes the importance of having a plan in place to handle short or long-term surge needs.

Events such as these World Championship Games may be attractive venues for a bio-terrorist event. Therefore, it is essential that a hazard vulnerability analysis be completed in order to identify the prospective risks to the local area. This analysis will determine the extent of the coverage that must be provided to ensure participant and spectator safety. Most international competitions face the same threats, but may need to be handled differently. Care must be taken in completing a thorough risk analysis. The local disaster plan must be reviewed, updated and incorporated into planning.

**Management of Evacuee Surge from a Disaster Area: Solutions to Avoid Non-Emergent, Emergency Department Visits.**

Irvin CR, Atas JG

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Reviewed by Ronald A. Langlotz

**PURPOSE:** The purpose of this paper was to identify acceptable alternatives to emergency department visits by people with non-emergent medical conditions post-disaster and to describe operations of a Hurricane Katrina evacuation center established in Michigan to address the critical needs of evacuees.

**METHODS:** This is a brief, non-research based, descriptive report. During a five week period, data were recorded on non-urgent evacuees as a result of Hurricane Katrina who required medical screening, referrals and/or prescriptions. The numbers of evacuees coming to the center and those receiving medical evaluations were tracked using a running tally system.

**RESULTS:** Seven hundred sixteen individuals presented to the Evacuee Center. Of that number, 631 (88%) people...
sought medical evaluation. The majority (about 80%) who were evaluated only required prescriptions. Of these, four people (<1%) required evaluation in a hospital emergency department. They included one man with chest pain, one man in acute hypertensive crisis, one woman who was hypertensive, and one woman diagnosed with pneumonia. The authors conclude that a multidisciplinary evaluation center can serve to meet immediate needs of evacuees with non-emergent needs. Often, evacuees from disaster areas can create a surge in emergency department admissions, and many of these individuals have non-emergent needs. The authors suggest that multidisciplinary care centers can lessen the burden on local area emergency department after a disaster.

COMMENT: This study emphasizes the value of managing disaster victims’ non-emergent medical needs through an appropriate screening and treatment process. Essentially, a non-research study, the author’s objectives were to identify and divert non-emergency care needs from local emergency departments. The authors’ assertions are based on the hypothesis that a lack in basic necessities, such as food, shelter, and required medications, may result in a visit to the local emergency department. These visits would be a stopgap measure when no other options are viable. During a disaster, evacuees may be displaced with little more than the clothing on their back. Some of these evacuees may have chronic health concerns that will require immediate prescription medication management and/or outpatient referral services. Without a doubt, local emergency departments would have the capacity to fulfill those needs. However, emergency departments in the US often are overcrowded. A rapid influx of evacuees certainly would result in a substantial burden to a system that is routinely stretched to capacity. The notion of a standard design to streamline the coordination of all the basic needs for evacuated individuals is not new. The idea of establishing a reception center to address those needs is a logical alternative to ensure those requiring assistance have their needs addressed quickly and appropriately. The inclusion of the Detroit Department of Public Health and the Wayne County’s Department of Homeland Security, along with other volunteer agencies to create one center to address all the evacuees’ needs is no small accomplishment.

In this report, data were tallied based on the number of evaluation forms completed. In addition, the numbers of prescriptions that were written were estimates generated by the two medical directors and likely limit the accuracy of the data. In the future, it would be helpful to create a research plan to include retrospective evaluation of the numbers of written prescriptions, local emergency department trends during evacuations, and evacuee follow-up to determine the long-range success of the program. Further research is warranted involving a more diverse assessment of those patients seen beyond 3–5 days. Nevertheless, the creation of a comprehensive reception center for disaster evacuees is a step in the right direction.

Information Technologies and the Sharing of Disaster Knowledge: The Critical Role of Professional Culture

Marincioni F


Reviewed by Mollie W Jenckes

PURPOSE: Informational technologies (ITech) have the intrinsic power to transform disaster communications, including potentially dramatically increasing the volume, speed, and efficiency of data transfer. The purpose of this study was to determine if the professional disaster management culture or attitudes influence the perception and application of ITech, and, as a result, control the process of incorporating ITech into knowledge transfer in disaster management.

METHODS: The sample was comprised of selected disaster management agencies in three states in the United States (US) (CA, MA, AL), and three regions in Italy (Campania, Toscana, Friuli Venezia Giulia). Using interviews and written surveys, 96 agencies from 76 locations were studied. Responses collected from 109 questionnaires were analyzed in order to determine how ITech was accessed and shared by emergency managers.

RESULTS: Eight types of emergency management agencies were studied and included; forecast/planning, law enforcement, medical, public works, fire department, military, private sector and charity groups. Responsibilities of Disaster Managers (DM) in the US and Italy included management of response plans, education, and research. Similarities between the US and Italy included the predominance male gender of DMs, limited academic background, good computer skills, use of ITech to expand professional networks, and views that ITech could improve access to and transfer of disaster information. However, in the US, ITech was viewed more positively as an aid during recovery/reconstruction and during search and rescue than in Italy. Despite many similarities between the US and Italian agencies, some interesting differences were identified. Forty-five percent of American DM had military/paramilitary experience compared to 4% in Italy. In fact, 53% of Italian DMs had public administration backgrounds. In terms of ITech, most American DMs used ITech to share information and to connect the usage with disaster cycle needs, while Italian DMs had a low propensity to share information using on-line technologies and lacked clearly identified ITech protocols for communications. In addition, DMs in the US had better knowledge and experience with special analysis technologies than their Italian counterparts. Regional differences were indentified. For example, in CA, younger disaster managers used ITech to access and share data at a professional level. In Italy, twice the percentage of respondents in Campania, compared to those in Tuscany replied that ITech enhanced professional dialogue. Two-thirds of respondents in Friuli Venezia Giulia believed that ITech did not improve disaster knowledge, preferring person-to-person contacts to enhance knowledge. Four major cultural components were found to influence ITech applications and use in disaster communications. These were identified as: technocentric,
geographic, anthropocentric and ecocentric approaches. From this investigation, the author suggests that ITech has reduced cultural isolation for those involved with disaster management and planning.

COMMENT: This article provides valuable insights into the future impact and realization of the possible benefits of ITech for DMx, and reveals the shaping of the future by the individuals holding DM positions. The comparisons at the state level in the US and the county level in Italy underscore the similarities and differences between groups within one country and across national borders in the use of ITech in the emerging field of DM. No doubt this is common in a newly developed field. The development and implementation of responses to future disasters will provide more needed real-life experience that may lead to standardization in ITech use across responses. As new workers enter the field with additional targeted and technical training, and evidence of the usefulness of ITech becomes more widely available, more dispassionate evaluation and further acceptance of ITech may occur. Limitations of this study include the fact that the US and Italy vary markedly in size, location, types of disaster events, as well as development of the DM sector. The survey instruments are described in only general terms, making it difficult to identify bias in interpretation. The author conceptualizes responsibilities of the US and Italian DMs, and the factors influencing disaster knowledge sharing in the US, but it would be more helpful to have provided reference points for these statements.

However, this report provides a baseline for describing the emerging profession of DM and barriers to widening the sphere of influence of ITech. With the global threats both of disasters from global warming and of man-made threats through rapid transportation of ideas and increasing weapons, ITech is a counter strategy for planning, preparation, and response that cries out to be integrated into this struggle. This article identifies areas for education and development to assist in further utilization of ITech in this field. DM training can be designed to address some of the identified issues, and future studies should focus on documented advantages of specific uses of ITech in DM.

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