A Community Disaster Exercise in Hartford, Conn.

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DISASTERS occur almost daily in every community in the United States. As a result, many communities accept disaster as inevitable and have become either overconfident of their ability to handle these events when they occur or are so disinterested as to ignore the training and skills needed to cope with them.

A disaster can be a fatal traffic accident or a holocaust involving hundreds of persons. Disaster training should be related to those events that may affect large numbers of injured persons such as floods, tornadoes, hurricanes, fires, explosions, or automobile, train, and aircraft catastrophies. Disaster training is needed for saving lives, shortening hospital stays, and reducing incidence of permanent disabilities.

Disaster training exercises must be as realistic as possible and the simulated episodes must be handled as if they had happened. There is no time for on-the-job training when disaster occurs, and the training exercise is the only means of gathering members of the emergency forces of a community to sharpen their skills. The exercise is serious make-believe. The fine line between life and death in a disaster is measured by the ability of police, fire, health, civil defense, and Red Cross personnel to contain the disaster, rescue the victims, institute meaningful first aid, transport the victims to the hospital safely and rapidly, and provide quality medical care.

Relatively few communities in the United States have held disaster training exercises. I believe those that have held them would admit that they were not properly prepared to handle a real disaster. We came to this conclusion after the exercise in Hartford on May 9, 1967, held after 6 months of planning.

The three major factors contributing to death and permanent disability of persons following catastrophies are poor rescue, including improper handling and related problems in the transportation of victims, inadequate first aid at the scene, and inadequate or improper medical care at the hospital.

This was demonstrated in the Hartford exercise, which was video-taped by Connecticut's educational television station and viewed later by the participants. This method of evaluation is far more meaningful than critiques made by official observers.

The Planning Phase

The training exercise was suggested by the city health department and cosponsored by the department and the Hospital Council of Greater Hartford, a voluntary agency representing the 13 hospitals in Hartford County. In December 1966 after numerous meetings with individual participants and representatives of participating agencies, a group meeting was held to discuss the undertaking. Participating agencies

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Health department personnel learned to simulate realistic wounds

were the city's health, police, and fire departments; Hartford, Mt. Sinai, St. Francis, and McCook Hospitals; the Institute of Living; Hartford's hospital council, American Red Cross chapter, ambulance association, county medical association, and civil defense agency; the University of Connecticut School of Medicine; and the State health department. The services of a consultant with experience in disaster training exercises were obtained.

In monthly meetings from December through May, the planning group reviewed papers on disasters and disaster exercises held elsewhere and discussed advanced training for police and firemen in emergency medical care and disaster management. They also discussed the source, role, and responsibility of medical personnel at the scene of a disaster, as well as who would provide first aid there. The use of emergency medical tags was considered, but we decided that they would be of little value.

It was pointed out that the basic responsibility of the fire department is rescue and fire control and that of the police department, spectator control and traffic routing at the scene and at the hospitals. The group decided that transportation of the injured would be left to the Hartford Ambulance Association, a group of private ambulance companies subsidized by the city. Their vehicles would be supplemented by other private ambulance and voluntary companies in Greater Hartford.

The planning group discussed but did not resolve who would assume leadership. Under a working agreement between Hartford police and fire chiefs, if fire or smoke exists the fire chief is nominally in charge, otherwise the police chief is in charge. However, in a large-scale disaster many unusual facets of disaster management are involved and acknowledged leadership is of utmost importance.

The role of the hospital in disaster planning and management received much attention, and the roles of Red Cross, civil defense, police, and fire personnel in disaster were clarified. Communications between all agencies involved in disaster management is of utmost importance. This was a particularly difficult problem because the agencies that had shortwave radios operated on different wavelengths and could not communicate with one another. Members of the planning committee spent a day with personnel of the Boston police department studying their methods of communication.

We appointed 26 observers to evaluate the exercise, and we outlined their duties and responsibilities in a meeting with them.

Many items discussed at the planning meetings were not resolved before the exercise. Committee members felt that the exercise would point out the community's needs and shortcomings. Hartford, like other communities, has neglected planning for disaster, and easy answers to the questions raised are not readily available. If disaster strikes at convenient hours the resources of the community are available; yet even at those selected hours, many needless deaths and permanent injuries occur by the time help arrives. Because minutes count if lives are to be saved, sound resolution of each matter considered is necessary if disaster management is to have meaning.

Realism

The participants agreed that realism would contribute significantly to this undertaking, and every effort was made to that end. Simulated



Victims were positioned throughout the building before the exercise. Litter and boards were strewn about for realism



Victim is carried out in a jackknife position despite chest and abdominal wounds

wounds for the exercise were prepared by 15 health department personnel trained in the fabrication of artificial wounds by a moulage expert. Army moulage kits were available, but wounds prepared with such kits lack realism.

The tibia bones of steers, obtained from a local supermarket, were prepared to simulate compound fractures of the arm, leg, rib cage, jaw, and clavicle. Pieces were glued to tongue blades which were secured to the selected anatomical regions by plastic tape, then covered with white putty, and blended with the skin using appropriate face powder. Simulated blood (coagulated and liquid) was applied around the wound. Second- and third-degree burns and imbedded glass wounds were also designed.

Special clothing with objects affixed to simulate puncture wounds was used. Clothing was torn just at the site of the wound or burned, depending on the type of wound. Each victim had just enough white grease paint applied to his face, neck, and other exposed parts to simulate shock, and glycerin was used to create the appearance of clammy perspiration. A few victims were given Fizrin capsules with red coloring added to hold in their mouths. When the capsule dissolved, the resulting red froth simulated a lung puncture.

At the time of the exercise the victims were positioned throughout the three levels of the selected building, boards and beams were laid across many of them, and powdered dirt was thrown on each. A truckload of rubble was dumped in front of the building and smoke bombs were lit to add to the realism and confusion.

The Exercise

The exercise was held in the 19th century Alumni Hall of Trinity College. The simulated episode was a boiler explosion with accompanying fire and partial collapse of the building. The injured were 56 male students and eight female health department employees. The planning committee felt that a minimum of 50-75 litter cases would be necessary to test the community's ability to handle a sizable number of injuries; therefore, no plans were made for ambulatory cases. The victims were made up with multiple compound fractures, extensive second- and third-degree burns, and large puncture wounds. Some participants pretended to be shock victims, and a few feigned screaming hysteria. In general, wounds were of such size and type as to present problems for the average first-aider.

The exercise was initiated with a radio message from the fire chief's vehicle at the disaster site to the nearest firehouse. As a result, there was a 10- to 12-minute delay in notifying other agencies such as the police department and Red Cross. This delay would not have occurred if a fire alarm box had been used, because the fire department dispatcher follows certain routine procedures of notification when a box call is received.

The exercise included hundreds of persons besides the 64 victims. The 26 official observers were located at the disaster site and at each of the hospitals, and each had a specific activity to observe. Forty ambulance drivers, attendants, and dispatchers, representing 14 private and voluntary ambulance companies and using 18 vehicles, participated. The Hartford Ambulance Association organized and coordinated this service before the exercise, griding the city into four areas and designating an ambulance rendezvous point in each so in case of a real disaster a pileup of vehicles would not occur. None of the ambulance companies knew the disaster site, and no ambulance moved from its home base until notified that the simulated disaster was initiated. It took some ambulances as long as 40 minutes to reach the rendezvous point.

Twenty-four firemen in three fire engine companies and a truck company and a deputy fire chief responded to this three-alarm fire. Had this event been real, 125 men in the four companies would have participated. However, to have all these men participate in the exercise, off-duty personnel would have had to be called back. Sixteen police cruisers and three motorcycles were at the disaster site, and four additional cruisers, one at each of the four general hospitals, were available for traffic control. Including headquarters personnel, 47 police officers participated.

Thirty-five Red Cross staff members and volunteers participated at the site and at the several hospitals. In addition, Red Cross headquarters alerted its active instructor staff. Had this been a real disaster, this group would have been instructed to proceed to the disaster site. The 15 health department personnel who created the artificial wounds picked up the victims at the hospitals and returned them to the campus at the conclusion of the exercise. Hundreds of persons at the four general hospitals—administrators, physicians, nurses, orderlies, and clerical personnel—were involved in patient care. Sixty of the 64 victims were taken to the hospitals; four were judged dead at the scene.

How is the use of these hundreds of persons in play-acting justified? The soundest argument is that little time is available for disaster organization after a disaster has occurred. The time available for helping the victim in an acute situation is usually minutes or, at the most, hours. Planning and practice are, therefore, the keys to readiness.



Victim is placed on tarpaulin by firemen who carried him under the arms, despite a laceration of the right arm, and at the ankles, despite a bleeding puncture wound of the left thigh



Victims were placed on blankets and litters after evacuation from building

Results

Representatives of participating agencies and observers held a critical session 10 days after the exercise. Observers gave verbal reports, which were followed by written reports. Because the victims were college juniors and seniors and health department personnel, we felt that they could contribute much to the evaluation. Each was asked to write an objective analysis of his experiences as a victim at the scene, in transit to the hospital, and at the hospital. Nineteen of the 64 responded. The video-tape was seen by all participants and then shown to the public.

There was no medical authority at the scene of the disaster. However, evaluations revealed great need for someone to make decisions about the order of treating and transporting patients, to administer pain relievers and reduce shock, and to determine extensiveness of wounds for notification of the hospitals. There also was no recognized leader to integrate and coordinate the participating services and agencies.

The need for better rescue and casualty management by fire and police personnel was obvious. The need for hurried rescue is unquestionable because smoke inhalation, fire, and further building collapse could add to the number of injured persons. However, there was no selection of victims for removal, and victims were lifted and transported with little regard to type or site of injury, and handled unnecessarily. Some victims were carried out and placed on the wet ground, picked up later and placed on a tarpaulin, and handled a third time to be put in an ambulance. Other victims brought out by litter were taken off the litter, placed on the ground, and subjected to further handling because of a shortage of litters. Some victims lay uncovered for 20-30 minutes.

Furthermore, ambulance litters were not interchangeable between ambulances, which meant a victim had to be removed from an ambulance litter at the hospital before the ambulance could return to the disaster site. In addition, most modern ambulances cannot accommodate the standard field stretcher because of its length.

The need for immediate designation of a treatment area was noted. As victims were brought out of the building, some were placed in the roadway in front of it only to be moved because they were blocking ambulance traffic. They were also so close to the disaster site that they were in danger of losing life or limb if the building collapsed further.

The need for more adequate first aid by police and fire personnel was recognized. Most first aid training only covers common wounds, and the uninitiated first-aider is confused by large or imbedded wounds. This indicates need for additional training for persons responsible for giving first aid.

The need to give more adequate, complete first aid after the victims were removed from the disaster site was obvious. Some students mentioned that treatment was initiated, but the person adminstering it was called away and did not return. Others wounded with imbedded objects were left untreated and uncovered because the first-aider did not know how to handle such wounds. At no time did anyone stay with a specific victim to give him comfort and reassurance.

The exercise pointed out the need to bring first aid equipment and supplies including tarpaulins, litters, blankets, splints, and bulk dressings, in quantity, to a disaster site as soon as the type of disaster is determined. Perhaps a prepared disaster vehicle should be available on a standby basis in every community.

Most victims reported proper handling and

transportation by ambulance personnel. However, several reported that ambulance drivers from out of town did not know the hospital locations. The ambulance coordinator reported that he lost control of half of the ambulances because they did not follow his instructions to return to the rendezvous site. In addition, each ambulance company is on its own shortwave frequency, and there was no way of communicating with an ambulance once it left the disaster site.

In general, hospital care was not criticized. However, one observer "found no evidence of effective triage and no followup (except on paper) with regard to immediate treatment and subsequent disposition. . . . I would recommend that mock disasters involve other areas of the hospital so that more may learn and more may be learned and yet not jeopardize the safety of the routines and necessary hospital functions."

It was also noted that there is an inadequate number of State highway signs and city street signs giving directions to the four general hospitals.

Police and fire personnel will aways be responsible for the early phases of disaster management because they are the first on the scene and the first to take effective action. Insuring that police and fire personnel have this specialized type of training and are aware of the consequences of improper rescue and first aid is a medical responsibility. Members of the police and fire departments must accept this role of rescue and first aid. Many fire and police departments have specialized rescue teams whose sole responsibility is the welfare of the victim. Perhaps all communities should develop this type of specialized corps.