

Educational approaches to mass casualty incidents.

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Commentary

The need for well-trained health care providers is paramount. Undoubtedly, in mass casualty events, the scene of a real incident is not an appropriate place to learn. Thus, clinical care for mass casualty incidents (MCIs) victims and scene management procedures must be preplanned and practiced pre-incident to be able to achieve the optimum outcomes. Hence, training must be a priority in any planning and response strategy. Around the globe exercises and simulations are the most accepted training methodologies to train emergency responders for mass casualty incidents [1]. Drills that simulate real incidents are commonly used to improve disaster preparedness and to allow for system evaluation in terms of capacity and capability. Even though with the best technology and simulations, incidents that occurred will be different from what has been exercised. Lennquist [2], has raised doubts about whether actions and decisions will be the same in an actual event. Training to be effective it must be both theoretical and practical; the use of simulation models offers the opportunity to integrate theory and practice [3]. McNaughton, emphasizes that in disaster or MCIs management, there is a need to be "trained", rather than being "educated". Health educators have to recognize the differences between education and training in medical education [4]. Whereas, education is a process of having a broad perspective on what is taught, while training tends to be more focused. Yet, learning from the science of disaster medicine education literature still overlooked [5-7]. Another challenge to mass casualty training is the infrequency of its occurrence which triggers the need for periodic training of those likely involved; to sharpen their skills and knowledge to the point where they will act in an autonomic manner should the need arise [8]. This periodic training has proved to be effective when preparing for other complex tasks and when procedural skills are likely to be forgotten over a short time-frame [9].

There are two approaches to assess the level of preparedness and ability to respond to mass casualty events; either by the experience of a real disaster experience or through training drills. Clinical competencies cannot to be taught or assessed in real incidents [10]. Additionally, studies have shown that there is little evidence about whether training effectiveness for preparedness purpose is sufficient [11,12]. Therefore, EMS organizations need to develop and apply a reliable and valid methodology for mass casualty training and education. Lennquist points out that training must be interactive through a realistic simulation exercise. Several approaches simulation exercises have been designed for the training of responders that need to be evaluated. This could be carried out in technology-dependent ways such as using computer simulation [13,14], or through a simple traditional disaster simulation based on a

discussion of MCIs scenario [2]. The essential principle is that simulation model that need to permit and encourage interactions between all participants including responders and victims such as employed through the Emergo Train System™ (ETS) and the Mass Casualty Simulation™ (MACSIM) system [15]. Some of the well-known interactive simulation's methodologies are:

Traditional table top exercise

This is dominated by the discussion approach, and mainly used to train responders on skills of decision-making and the logistics of response [11]. This approach requires minimal space requirements to achieve interactivity and it is not a complicated method of training. The leader discusses with participants a specific scenario to determine the strengths and weaknesses area in present emergency plans and aims to improve response procedures and protocols. The training method considered time-and cost-effective, and because of its simplicity, it does not impede daily operations compared to other training methods such as functional drills and exercises [16].

Table top exercise (Developed simulation models)

This is experiential-based learning that offers a considerable degree of interactivity between the participants through a virtual environment in which participants respond to the scenario and learns to respond appropriately. This simulation system uses symbols to illustrate resources and injured patients on whiteboards, tables or computers. Again, this form of training considered to be more cost-effective than field exercises [2]. There are two best-known pedagogic table-top simulation tools for interactive training in the field of disaster medicine and health-care are; the Emergo Train System™ (ETS) and the Mass Casualty Simulation™ (MACSIM) system [2,17]. With these simulation systems, participants will have the opportunity to live an experience that simulates all the management stages of the selected incident with the different components of the emergency medical chain of response. These systems allow mentors to make a judgment on the decision-making skills related to safety measures, communication, coordination, and command and control. Furthermore, they record trainees' emotional reactions and interactions with each other through realistic scenarios [2]. These systems use magnetic symbols representing victims, ambulances, treatment cards that are moved around whiteboards. Even though, these simulation models are widely utilized as interactive training for response to major incidents and disasters [17].

Functional exercise

It is a simulated interactive exercise that tests the capability of one emergency organization or more to respond to a simulated incident without moving real people or equipment to an exercise site [11]. This exercise is mostly focusing on coordination and management within or between various response organizations. This training approach is more resource consuming in terms of time and is expensive than table-top exercises, and could divert resources from other urgent calls for medical care [11].

Full-scale exercise

It is simulated MCIs that is designed to resemble a real incident. This type of exercise involves all emergency organizations that would be expected to participate in real response operations. These organizations generally include ambulance, police, fire brigade and rescue services. While the military and security services will be involved in major incidents with national security implications. A full-scale exercise aims to test the preparedness of the multidisciplinary emergency system and hence there is a need to fully deploy equipment and personnel as if it was a real incident. Within this operation-based training representatives from all organizations should participate in the exercise. This requires early coordination and preparation among organizations to make sure the scenarios are credible and can be implemented [18]. When well-done, this provides emergency services agencies the opportunity to practice MCIs response in a complex realistic environment especially where figurants acting as injured/shocked/uninjured patients [19]. The experience in Boston demonstrated that full-scale exercise conducted amongst emergency personnel response before the bombing had a positive impact on the response operations of the Boston Marathon terrorist bombing 2015 [20]. The recent disasters and major incidents during the last years have raised the need for more efforts and resources to disaster preparedness all over the globe. Health care leaders have a great responsibility to assure valid and effective mass casualty training for all health care personnel [21]. Maintaining high-quality education and training is one of the most important components of proper emergency management systems.

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