

# EMS and Beyond

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*Confidence does more to make conversation than wit.  
La confiance fournit plus a la conversation que l'esprit.*

La Rochefoucauld  
*Maximes*, No. 421

It is assumed that *any* EMS system will be able to manage the surge of injured or ill patients created by *any* event. The EMS continuum<sup>1</sup> includes prehospital relief responses and in-hospital services including the emergency departments, the functional surgical and intensive care capacities, and all of the support functions. These projections seem to apply regardless of the number of injured or ill or the time interval over which the affected population is impacted. Multiple- and mass-casualty events are viewed as requiring similar responses, and the terms "multiple" and "mass" often are being used interchangeably. However, the role of emergency medical services in each of these types of events is remarkably and notably different.

In essence, the scope of multi(ple)-casualty events (MUCE) and mass-casualty events (MACE) is so different that they demand very different planning and responses. For example, it is relatively straight-forward to conduct simulations/exercises to promote the management of a MUCE. But, it is difficult to simulate a realistic MACE; thus far, mass-casualty situations only have been simulated using tabletop exercises.

A *disaster* for a health system is when the losses of the health functions due to damages caused by an event are sufficiently severe to require outside assistance to help to sustain its basic health functions. Thus, when a MUCE or MACE results in sufficient human damage and overwhelms the resources of the "local" EMS system, a health disaster has occurred. In this sense, "local" may mean a family unit, a neighborhood, the workplace, a community, a state or province, country, or any unit of government. But, the confusion that accompanies such levels of damage relates, at least in part, to the differences between multiple and mass casualties.

Therefore, it is helpful to examine the differences between a MUCE and MACE. *Multiple* is defined as having *many* individual parts, or elements.<sup>2</sup> The key word in this definition is "many". *Many* is an adjective that means constituting or forming a large number,<sup>2</sup> and *large* means measuring or amounting to *more than average* size or quantity; on a scale beyond average.<sup>2</sup> Thus, a multiple-casualty event creates more casualties (in numbers) than is *normal* for the EMS system responsible for the responses to the human damage sustained. However, it follows that the local EMS system should be able to manage the number of casualties related to the event. Prehospital and in-hospital EMS systems generally can prepare for the surge created by multiple casualties.

However, this does not hold for events resulting in a massive amount of casualties. By definition, *mass* is a body of

coherent matter of indefinite shape or size; a considerable number or quantity.<sup>2</sup> It follows then, that the "local" EMS systems are not be able to manage all of the victims. For events that produce massive numbers of casualties, the system is overwhelmed and many victims whose lives possibly could have been salvaged in a multiple-casualty situation will succumb to their injuries/illnesses as they will not be tended by the emergency medical services personnel. Persons with potentially survivable injuries/illnesses will succumb in a mass-casualty scenario regardless of whether they are in the field or in a medical facility. The population-at-risk must recognize that EMS will not be there to assist *all* of them.

Massive quantities of injured/ill persons produce unique circumstances that are similar in both the prehospital and in-hospital settings. Both components may be handicapped by an inability to gain access either to the scene or to the medical facility, damage/destruction of infrastructure, equipment, supplies, and staff, resulting in an inability to function even at the pre-event level, much less deal with the surge of persons requiring medical care. Even if the uninjured/healthy staff are able to report to their respective work setting, there never will be sufficient professional staff to manage the masses. Staff may be injured or ill and unable to work, they may have been killed by the event, they may elect to support their respective families and not report for duty, they may have lost family members, and damage to the transportation infrastructure and short supplies of fuel may compromise their access to the scene or the medical facilities.<sup>3</sup> Inadequate supplies of fuel may further limit access not only by personnel, but also to replacement supplies and equipment including food and water. In addition, many of the societal functions will compete for the same resources. Furthermore, external responses to assist the locals generally will not arrive and become functional for 1–2 days.

Instead of tending to victims, the first-responding prehospital EMS personnel must assess the situation, request assistance, and establish field coordination and control. In the medical facilities, the "mass-casualty" plan implemented must include the establishment of coordination and control. It should be clear that "just-in-time" supplies will not sustain care for the masses. Persons with potentially treatable injuries or infections may die due to lack of adequate numbers of personnel and supplies. In such circumstances, there never will be enough personnel. Thus, plans must include alternatives to total dependence on the staff of the EMS system.

There are several potential solutions to this dilemma.

1. *Education and training of the lay public and military*—In a mass-casualty situation, the uninjured survivors will attempt to rescue the injured. Also, the local population cannot depend on being rescued or treated by prehospital EMS personnel, as the numbers of available person-

nel will not even make a dent in the needs. Therefore, it seems that the uninjured/non-infected public is responsible for rescue and the provision of immediate first aid to themselves and their family members, neighbors, and fellow workers.

In several surveys conducted here in Madison, Wisconsin USA, very few of those surveyed had any level of "preparedness"; they had no plan, had not sequestered food, water, and other necessities, and believed they could depend on the government to rescue them.<sup>4</sup> Perhaps people don't want to be bothered by and/or take the responsibility for personal preparedness. Perhaps, "preparedness" is not the most appropriate word, and the use of "protection" would create more interest. Following profound flooding in Bangladesh, a campaign was initiated in the school system to educate and train students about what to do in case of such an event. The next similar flooding event was accompanied by a profound reduction in the number of deaths and casualties.<sup>6</sup>

Furthermore, as demonstrated following the earthquake and tsunami in Southeast Asia in 2004, even though the military was present in the impacted area, the troops did not possess the knowledge or skills to provide assistance to the injured.<sup>6</sup> Often, the military has been the first to arrive following such an event, but rescue and first aid have not routinely been part of the military's mission, and for the most part, personnel have not been prepared adequately to be able to assume such a role. The military has the resources and the logistical capacity to be of great assistance; therefore, the military and lay public must be prepared in order to impact life-saving during and following disaster-producing events.

2. *Task-Shifting/Sharing*—Even with preparing civilians to protect themselves and their family, given the current situation, there never will be sufficient numbers of health professionals to cope with massive numbers of casualties. In such circumstances, it often is prudent for health professionals to practice at levels beyond their normal scope of practice. But, even if persons are trained to function at a higher level than normally expected, there still will not be sufficient numbers of health professionals to provide the needed assessments and care. Thus, we must educate and train medical and non-medical persons to function in such situations. This also means preparing medically untrained personnel to assume some of the medical tasks required. An example of training medical students in the support of airway and ventilation.<sup>5–7</sup> Further, as evidenced

in the US by the formation of the Medical Reserve Corps, retired or unemployed professionals can be pressed into service to assist. We must plan on task-shifting some of our responsibilities to others, but clearly, we still must be responsible for assuring their competence to do what they are assigned to provide.<sup>8</sup>

3. *Alternate sites*—When medical facilities suffer heavy damage or are destroyed or when besieged by massive numbers of casualty, or if a facility must be evacuated (see page 468), alternate sites (closed hospitals, hotels, sporting arenas, etc.) that could be mobilized to provide needed services must be available and able to rapidly assume the functions normally provided by the damaged medical infrastructure. Agreements and equipping of such alternate sites must be completed as part of the plans.
4. *Field hospitals/clinics (FFH)*—Especially following sudden-onset, short duration events (earthquakes, tsunami, mudslides, etc.), foreign field hospitals and staff arrive too late to provide life-saving care.<sup>9</sup> Generally, they serve as alternate sites in which they provide the routine care that no longer can be provided by the compromised, impacted local medical facility. The incoming, responding personnel only supplement the locals and never should usurp their roles.<sup>6</sup>

Therefore, it is essential that we separate our planning for multiple casualties and mass casualties. Emergency medical services systems should be able to adapt to the challenges created by multiple casualties. However, in mass-casualty situations, EMS systems must assume the role of coordination and control and of keeping all parties informed. It is not appropriate to believe that EMS systems will be the panacea for massive numbers of casualties and the load and responsibilities must be assumed by those affected and the medical care must be supplemented by persons who can shift part(s) of their normal tasks. There must be two distinct plans: one for managing multiple casualties, and the second for management of massive casualties. Currently, we have been preparing for multiple casualties; the concept that all that will be required to manage massive numbers of injured/ill is more multiple-casualty teams is not appropriate. This may well be tested in the potential massive quantity of persons who will be infected with H1N1 or another variation of the same. "Protection" seems better than "preparedness".

*Confidence is a thing not to be produced by compulsion. Men cannot be forced into trust.*

Daniel Webster  
*Speech, US Senate, 1833*

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