

# A Test of Interprofessionalism During the Las Vegas Mass Casualty Incident

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## Introduction to Mass Casualty Incidents:

While the homicide rate has decreased in the United States over the last 40 years, mass casualty incidents (MCI) have unfortunately become increasingly common.

MCI events are also becoming larger. A few recent examples of MCI events are:

Las Vegas	Orlando	Charleston AME	San Bernardino	Bataclan, Paris	Aurora, CO
639 victims	102 victims	14 victims	36 victims	>482 victims	70 victims

Table 1: Examples of mass casualty events.

A common feature of MCIs is that existing medical capacity is overwhelmed in the first phase of an event. During this phase, the need for medical resources develops faster than the ability to deliver those lifesaving resources. Crisis Standards of Care must be applied to the problems of space, staff, and supplies. Staff are typically required to expand their scope of practice in these circumstances. Expanded scope of practice is highly reliant on the strength of interprofessional relationships.

## The Challenges of Response:

In modern computerized medical facilities, the information needed to assess the scale, the medical needs and the tracking of victims are found in the electronic health record (EHR). During an MCI, the computerized physician order entry (CPOE) system would ideally direct life-saving resources to patients identified in the EHR. An unintended consequence of EHR and CPOE system design is the time-consuming requirement for patient registration. Electronic medical record systems are built for maximum documentation and billing capture, not flexibility of use in high velocity MCI events. The limitation of EHR and CPOE scalability created a significant choke point in hospital response. The volume and severity of the victims, combined with the abrupt failure of the EHR and CPOE systems presented severe challenges to the response that required the best of interprofessional cooperation to overcome.

As part of a larger research effort, a research team recorded victim arrival by mode and triage class by using the video monitoring system at the ambulance bay.

206 MCI Victims		
Mode of Arrival		
	Ambulatory	10
	Civilian Car	53
	Hired Car	2

	Police	7
	Ambulance	109
	Unknown	25
<b>MODE TOTAL</b>		<b>206</b>

<b>Triage Class</b>		
	Red	44
	Yellow	127
	Green	35
	DOA	0
<b>TRIAGE TOTAL</b>		<b>206</b>

Table 2: Mode of arrival and triage

class

The temporal distribution of victims was plotted by the research team.

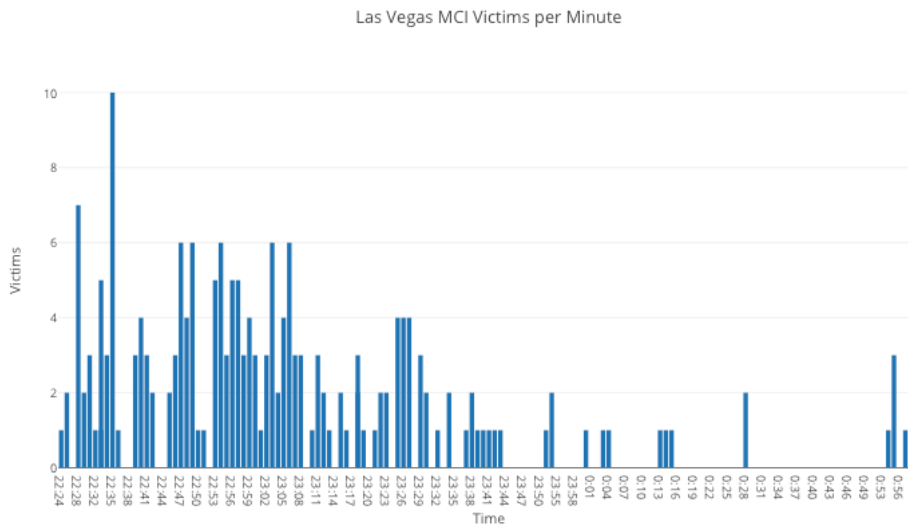


Figure 1: Victim arrival per minute

The temporal distribution of victims by triage class was also plotted by the research team.

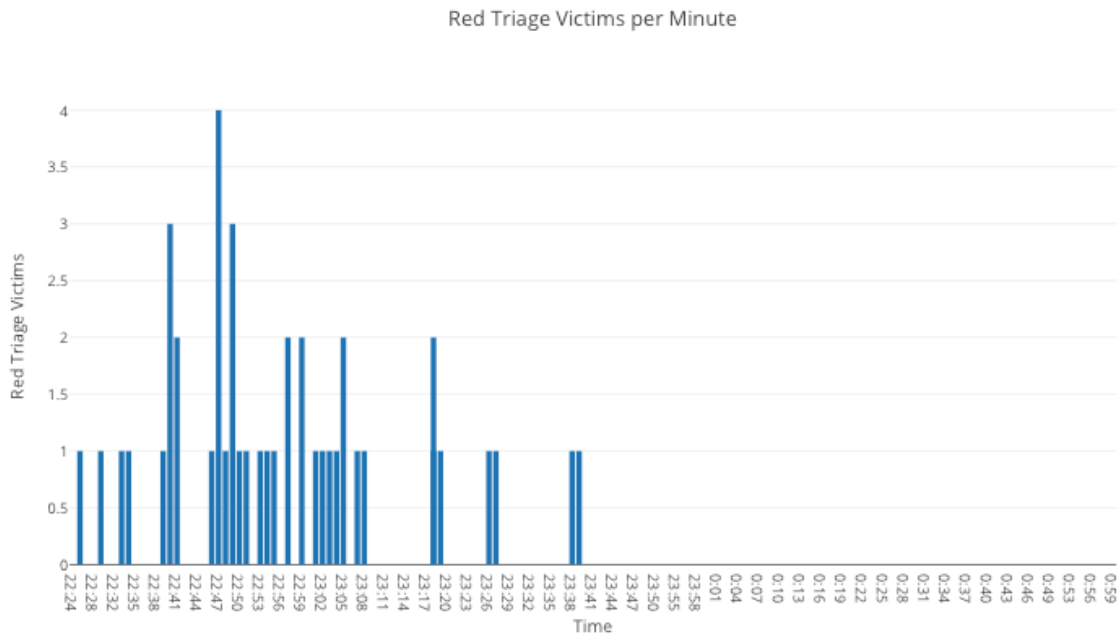


Figure 2: Arrival of Red Triage Class Victims per minute

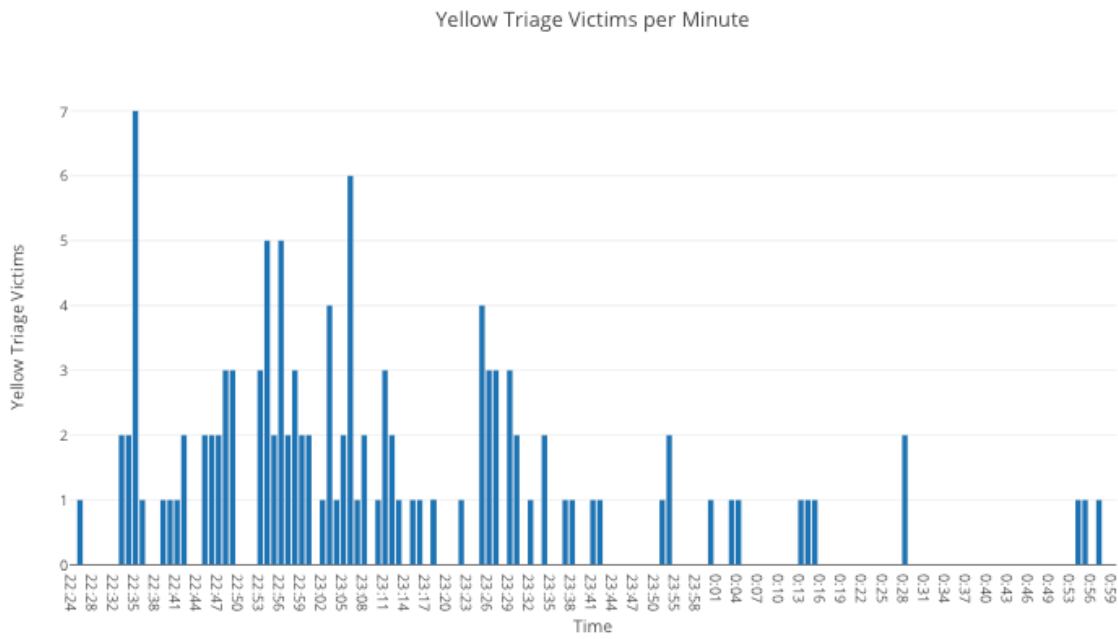


Figure 3: Arrival of Yellow Triage Class Victims per minute

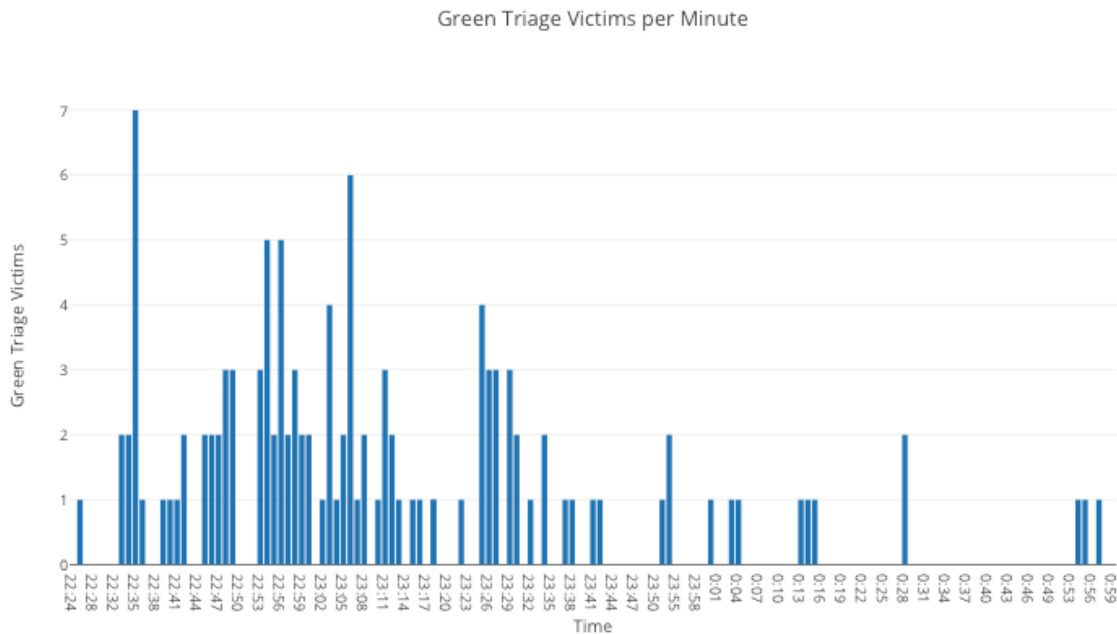


Figure 4: Arrival of Green Triage Class Victims per minute

**The Effects of Volume and Severity:**

Although acute shortages of medications and equipment are predictable in a MCI, the facility also experienced an unanticipated information system failure in its EHR and CPOE systems. The time lag for registration of victims during this high velocity event, combined with a lack of backup systems, caused the computer information system to fail. A failure without other alternative represents a system failure that can be termed “brittle”. A brittle system may be represented by an elevator malfunction. On the other hand, a gentle system failure may be represented by an escalator malfunction. After failing, the escalator is not as efficient, but it remains a stairway while the elevator is useless, and in fact may be a hazard. The October 1 Las Vegas MCI exposed the brittle failure of the EHR and CPOE system in response to a high velocity event.

A manifestation of this brittle information system failure was in inability to result labs and radiographic studies to patients due to the lack of registration. A typical work around for the lack of registration is to use a trauma patient nomenclature such as “Trauma Andrew” or “Trauma Bob” to designate serial trauma patients. This nomenclature system failed due to the event velocity and need for multiple lifesaving interventions on multiple patients. Emergency physicians found it difficult to remember who “Trauma Bob” was after victims had been moved from the resuscitation area to the operating rooms or to an intensive care unit. With over 200 patients presenting in 150 minutes, the alphabetic nomenclature would have been used 8 times, generating multiple “Trauma Bobs”.

The use of modified military style weapons, combined by the high density of concert attendees in the target area, yielded an event of uncommon injury severity and velocity. Las Vegas emergency medical services, police, first responders, emergency department personnel, trauma and specialty surgery personnel, and the medical staffs of area hospitals responded with professionalism and commendable

effort. Shortages of personnel, space, and supplies forced crisis standards of care and expanded scope of practice. Examples of critical supply shortages include:

- Pharmaceuticals,
- Chest tubes,
- Blood,
- Bandages,
- Airway equipment, and
- Rapid Infusers.

### **An Interprofessional Response:**

In response, the emergency department commandeered staff and crash carts from the hospital. Each staff member was provided a stretcher or wheelchair and the emergency medicine physicians stationed themselves in airway and procedure stations, while the trauma team positioned its members in the OR. As patients arrived, staff members, at the direction of the most experienced medical personnel in the triage area transported the victims to the treatment stations for temporizing treatment. Because of the loss of the information system, no laboratory was obtained. Blood transfusion was provided on clinical assessment. The most severely injured were transported to the OR for damage control surgeries. Surgeons, emergency physicians, nurses, techs and staff all worked together to direct the patients to the right resources. Nursing and staff operated with an expanded scope of practice in an interprofessional collaborative self-organizing network. For example, a work around radiology solution was to use a portable X-Ray machine with a staff radiologist following, interpreting, and then writing the results on the body part of the victim with a marker.

Hospitals operate at near capacity due to economic pressures. Additional care space was recruited from procedural rooms and was staffed by available personnel. Because of the need for hospital space, existing inpatients who could be discharged needed to be reassured and care plans made. Hospitalists, floor nursing, social work and the hospital chaplain worked diligently to make space for the victims as they were stabilized. Because environmental services were overwhelmed, all took part in keeping our areas as clean and unlettered as possible.

The next day, when family members came searching for their loved ones, multi-specialty interprofessional teams were again organized to inform families of their lost loved ones. The teams were composed of a nurse, social worker, chaplain, and physician. Depending on the needs of the family, the team provided needed care during a time of need.

The event velocity experienced in the Las Vegas MCI was uncommon, however, the occurrence of MCI events is both more frequent and more severe. Given these trends, American medical professionals must be supported by wise policy and improved scalable of clinical information systems. Expanded scope of practice should be developed and trained. The modern MCI is a public health threat and should be addressed by improving medical system surge capability, including information system scalability.

*Dr. Allswede responded to the event and arrived among the first in relief. He then returned the next day to aid the families of the victims.*