Emergency Medical Response

Photo Credit: Kristian Johansson | Flickr

BY JOE NOSS '20

The San Bernardino terrorist attack was the deadliest on American soil since 9/11. The number of casualties was substantial, but it could have been even higher without the effective and swift work of emergency medical services (EMS). EMS training for a crisis of this magnitude prepared them to implement protocols used in a mass casualty incident (MCI) quickly. This account of the EMS response is drawn from *Bringing Calm to Chaos, A critical incident review of the San Bernardino public safety response to the December 2, 2015, terrorist shooting incident at the Inland Regional Center*, by Braziel, et.al., published by the Police Foundation; *EMS Crews Share their Experience of the San Bernardino Terrorist Attack*, by Crews and Heightman, published in the *Journal of Emergency Medical Services*; *The San Bernardino, California, Terror Attack: Two Emergency Departments' Response*, Lee, et. al., published in the *Western Journal of Emergency Medicine*; and news articles in the *Los Angeles Times*, *San Bernardino Sun*, and *The Press-Enterprise*.

The planning and preparation for an MCI began years before the San Bernardino attack. Following the 1999 Columbine school shooting, police departments and EMS across the nation began conceptualizing and implementing methods to deal with mass casualty incidents. The San Bernardino Police Department introduced active shooter training drills in 2000 and made them part of in-service training in 2007. EMS personnel also engaged in similar training. For example, the San Bernardino City Unified School District Police conducted an active shooter drill in 2013. The exercise enlisted a number of city departments and tested the core capabilities of unified command, victim extraction and triage, and medical surge at area hospitals. Other law enforcement agencies and fire departments also engaged in similar training. This culture of preparedness was central to EMS effectiveness during the San Bernardino attack. Training for MCIs delineated a series of priorities for both the police and EMS: capture suspects, save lives in proximity to the shooter, ensure safety of citizens, ensure safety of officers, contain suspects, and then investigate after the event. The Police Foundation analysis noted that personnel across the different departments lauded these drills, as they trained the agencies to react to situations cooperatively, just as they need to do in a real crisis. The focus of these training drills was the rescue of injured civilians and

officers. The drills were chaotic, showing officers how MCIs are "difficult venues in which to operate, because of environmental factors, confusion, victims' injuries, and pleas for help." The objectives of these drills were multifaceted: they enabled the fine-tuning of incident command support rules, helped the different departments to understand the methods of simple triage and rapid treatment (START), and oriented the different staff to new MCI-specific supplies. Many San Bernardino departments, such as the SBCFD, were already used to treating shooting victims, increasing their ability to respond and care for patients.

In addition to the preparation of the various departments, there were a few chance factors that both benefited and hindered the EMS. On the day of the attack, the two nearby trauma centers, Arrowhead Regional Medical Center in Colton, and Loma Linda University Medical Center and Children's Hospital in Loma Linda, were both fully staffed. There were two complete police SWAT teams engaged in an active shooter training exercise at nearby Arrowhead Springs Hotel and a San Bernardino County Sheriff's Department helicopter was also in the area. All of these circumstances contributed to an effective response. On the other hand, the San Bernardino County Fire Department EMS had not yet received new gear that was scheduled to be delivered on the afternoon of the attack. This new gear included color-coded treatment tarps and triage tags that would have been useful during the crisis.

Officers from the San Bernardino County Probation Department (SBCPD) were among the first on the scene, due to the proximity of their office to the IRC. A probation sergeant heard the call over the police radio and raced to the IRC with another probation officer, arriving in less than three minutes. They found a scene of people hiding behind cars, trees, and an electrical box. They gave a first aid kit to a group of injured people and prepared to enter the building. They were, however, dissuaded from this course by the number of injured people they encountered outside the building. Instead, they called the probation office for help. Dozens of probation officers arrived within minutes. The Police Foundation report refers to them as "an army of probation officers" and they were instrumental in moving injured people from the IRC to the triage and treatment areas. The command post leadership eventually utilized this large team of probation officers to secure the building and triage area perimeters.

The first EMS operative to arrive on the scene was San Bernardino County Fire Department tactical paramedic Ryan Starling. Starling had been training with the police department SWAT teams at the Arrowhead Springs Hotel. He entered the IRC with a SWAT team and found a chaotic situation in the

PATIENT TYPES AND SEVERITY

Injury Severity and Deaths	Number	Definition
Deaths	14	Triaged on scene as dead.
Gunshot wounds -- critical	11	Patient required emergency surgery.
Gunshot wounds -- complex	5	Patient had wounds involving multiple systems, i.e., soft tissue with fractures or soft tissue with neurological deficit.
Gunshot wounds -- soft tissue only	4	Patient did not require surgical repair or wan not accompanied by life-threatening blood loss.
Orthopedic injuries	8	Non-life-threatening wounds not caused by gunshots, i.e., trip and fall.
Total	42	

Source: *Crews and Heightman, EMS Crews Share their Experience of the San Bernardino Terrorist Attack, Journal of Emergency Medical Services, August 2016.*

HOSPITALS RECEIVING PATIENTS	
Hospital	# of Patients
Arrowhead Regional Medical Center	6
Loma Linda University Medical Center	5
Community Hospital of San Bernardino	2
Kaiser Hospital Fontana	2
Kaiser Hospital Ontario	2
Riverside County Medical Center	2
San Antonio Community Hospital	2
St. Bernardine's Medical Center	1
Total	22

Source: Lee, et.al., *The San Bernardino, California, Terror Attack: Two Emergency Departments' Response*, Western Journal of Emergency Medicine, January 2016.

conference room. With the sprinkler system going off, "the water was flowing out the entrance door and had a red tinge of color to it. It was obvious it was the blood of the victims." The air was smoky from the discharged weapons, fire alarms were sounding, and victims were pleading for help. Starling turned from his tactical medic duties and began triaging patients in the conference room, using START. He marked victims with medical tape to best identify those who needed immediate and rapid extrication to the casualty collection point and treatment area. SBCFD officers Ron Good, Greg Soria, John Miller, and firefighter/paramedic Cody Strickland joined Starling and began re-triaging patients. The crew used black triage tags for the deceased, and red, yellow, or green tags to rank the urgency of victims' wounds. The deceased were left in place, while the red, yellow, and green-tagged patients were put in police vehicles and moved from the casualty collection point to the triage and treatment area at the San Bernardino Golf Club across the street from the IRC. Although the paramedics did not have the MCI kits, they were still equipped with wound clot and pressure dressings, occlusive chest seals, and tourniquets, enough for the triage at hand.

Once identified, officers dragged, carried, or used chairs to remove the victims from the conference room, placing them in vehicles outside the IRC, which took them to the EMS area. The triage area was initially set up near the IRC entrance, but was determined to be too close and was later moved to the golf course across the street. The officers did not have stretchers and had to carry wounded people by hand or with blankets to the new triage zone. The probation and other officers carried injured victims to cars, which quickly formed a conveyor-like system to drive victims to the nearby triage and treatment areas.

Once victims reached the triage zone, firefighters and paramedics began treating victims. Tarps were set up in the triage area to designate the different levels of trauma. Ambulances began arriving rapidly at the triage zone, carrying the various wounded to local hospitals. A San Bernardino County Fire Department helicopter landed on the golf course to airlift patients to a hospital in Riverside County.

The *Golden Hour* is defined by EMS as the first hour of trauma. Research shows that if injured persons reach a hospital within a the first hour, their likelihood for survival increases. Captain Kevin Whitaker led the transport effort at the triage area. He made several key decisions regarding the destination hospitals for the injured victims. Whitaker utilized the San Bernardino County Fire Department Air Rescue 6 to air-lift two patients to a trauma center in Moreno Valley. The

air-transport took just under 11 minutes. Whitaker organized the transport of the 17 critical patients, all of whom were moved to local facilities within 17 minutes of reaching the triage/treatment zone. They were sent to eight different hospitals, thus avoiding overloading any one of them. All 21 patients transported by EMS, along with one other transported in a police car, survived. Altogether, it took fifty-seven minutes to get them out of the IRC and to a hospital.

Throughout the crisis, the EMS had many successes. The excellent coordination between EMS and fire departments was a result of their MCI training, enabled them to establish casualty collection, triage, and treatment areas quickly. Moreover, the newly created ReadyNet notification system allowed quick communication with the nearby hospitals, helping the trauma centers prepare for the influx of patients. This efficient coordination meant that all injured victims were cleared from the casualty collection point at the San Bernardino golf course very quickly. It is also significant that EMS personnel themselves avoided injury. As Captain Whitaker noted to Crews and Heightman, "If anyone involved in patient care had ended up at the hospital, we would have felt that we screwed up. Since our engines retained their full complement of personnel after the incident and were able to go back into service when we were done, we did well."

Despite the success of the emergency medical response, many first responders felt both unprepared and underequipped. For example, the probation officers who first arrived on the scene felt they were not adequately trained or equipped to provide emergency medical care to the IRC shooting victims or wounded colleagues. The Police Foundation report notes that one probation officer remarked that he "geared up and tried to give first aid, but our first aid kits were insufficient to treat the wounds." Moreover, the MCI training received by EMS and fire personnel did not simulate the transition from an active shooter situation to an MCI. The training did include victim rescue, but did not go into enough detail about the necessary role tactical rapid response and victim rescue teams would play.

As a result of the lessons learned from San Bernardino attack, public safety agencies have already begun developing new protocols for active shooter situations. As suggested by the Presidential Task Force on 21st Century Policing, "every law enforcement officer should be provided with tactical first aid kits and training". The various San Bernardino departments, including the Probation department, have implemented training and equipment programs to deal with future MCIs. Similarly, learning from the suspicious package situation that arose, EMS teams now set up triage areas in what are called "warm zones," areas that are not so close to the "hot" active shooting, but not as far away as the "cold zones" like the golf course. This change in tactics will enable EMS to provide first aid and triage more quickly, while other first responders contend with the shooting. ◆

Trauma Centers Prepare for Shooting Victims

Most of the severely injured victims were transported to Loma Linda University Medical Center or Arrowhead Regional Medical Center. Both operate designated trauma centers and were able to mobilize staff and resources quickly. Both hospitals cite prior disaster drills as invaluable to prepare their well executed responses. Loma Linda and Arrowhead both learned of the shooting on December 2, 2015, by phone calls directly from officers at the IRC, several minutes ahead of the official ReadyNet notification. What follows is a brief outline of how each hospital prepared upon receiving notice of the IRC attack.

Loma Linda University Medical Center and Children's Hospital

- The charge nurse and nursing administration began the emergency response, activating the disaster plan. The hospital established an incident command center in the nursing administration office, away from the emergency department.
- The emergency department was full at the time of the attack and all admitted patients were moved, in compliance with the disaster plan. The hospital relocated remaining patients away from six adult resuscitation rooms and cleared and readied an additional five beds in the pediatric emergency department. People in the waiting room were moved to other areas.
- The emergency department attending physician contacted the trauma surgeon on call. The trauma medical director placed additional trauma surgeons on call and contacted the operating room manager to clear the operating rooms for victims. They were able to make five operating rooms available immediately, with others freeing up shortly. The operating rooms were kept on standby for about four hours.
- Within 20 minutes, the hospital set up a triage tent, with basic supplies, outside of the emergency department. Patients already in the waiting room were moved to available emergency department beds out of the resuscitation area, and to an Express Care associated with the emergency department, and later into the triage tent.
- At the time of the activation, the emergency department was staffed with two adult and one pediatric attending physicians. Four additional attendings arrived quickly. Because an emergency medicine conference was in progress on campus, they were soon joined by many others. Before the first patient arrived, 26 emergency medicine residents, three pediatric emergency medicine fellows, seven attending emergency medicine physicians, and five pediatric emergency medicine attendings arrived in the emergency department.
- The chief of trauma surgery, along with three additional attending surgeons, five trauma residents, and a trauma nurse practitioner came to the emergency department. They were joined by three additional attending surgeons.
- Many nurses reported to the emergency department, in addition to those summoned as part of the disaster response. There were approximately 50 nurses and techs available.

Arrowhead Regional Medical Center

- Three emergency department attending physicians were on duty, one of whom is also trained as a tactical medicine SWAT team member. Because the hospital was able to mobilize additional physicians and residents who were already on campus, he decided to respond to the scene of the shooting with the SWAT team.

- The hospital immediately fully staffed its eight trauma beds. Each bed had anesthesia, emergency medicine, and trauma surgery personnel. In addition they converted four medical beds into lower acuity trauma beds, for a total of 12 available trauma beds.
- Three trauma nurses were present and three additional responded to the call for extra help. The charge nurse also sent five emergency department nurses into the trauma resuscitation area. An emergency department tech was also assigned to each bed.
- There were five emergency attending physicians, 20 emergency residents, and several physician assistants in the emergency department.
- Four attending trauma surgeons and eight general surgery residents also responded. Overall, the hospital was able to assign at least one attending (either trauma surgeon or emergency medicine attending) and two residents to each trauma bay.
- Four attending anesthesiologists were present, each assigned to two trauma bays.
- Two nurses were assigned to each trauma bay, preferably using the combination of one trauma nurse paired with an emergency department nurse. Each trauma team also had a respiratory tech.
- The hospital placed eight operating rooms on standby, placing all elective non-emergent surgeries on hold.
- Internal medicine service and pediatric service quickly admitted several pending patients to free up as many emergency department beds as possible. All patients already in the waiting room or in emergency department rooms were seen and evaluated by a separate emergency department crew. The hospital did not use an outside tent because they were able to clear a large number of emergency beds quickly.
- Many off-duty emergency department staff offered to report and many of them did come. In total, more than 70 additional staff from various services came to the emergency department.
- The hospital went on lockdown when it received reports that the shooters might have been San Bernardino County employees. SWAT members took posts outside the hospital, with snipers on the rooftops. Armed police officers took posts inside the hospital.

The medical teams at Loma Linda University Medical Center and Arrowhead Regional Medical Center both identified areas in which they could improve. These include communication with onsite command and first responders, crowd control, having an established location for family assistance, and additional identification tags to identify fully gowned and masked personnel. Both teams emphasized the importance of disaster training to their successful response that day. The Loma Linda team notes, "With a disaster drill recently conducted in our hospital, the initial set up of the [emergency department] with equipment, communications, triage, and security occurred seamlessly." Similarly, the Arrowhead Regional team concluded, "[O]ur response was well-organized, well-run, and well-staffed. We were incredibly proud of the teamwork that was displayed and amazed by everyone's willingness to step up and help out in such a challenging situation."

Source: Lee, et. al., *The San Bernardino, California, Terror Attack: Two Emergency Departments' Response*, Western Journal of Emergency Medicine.