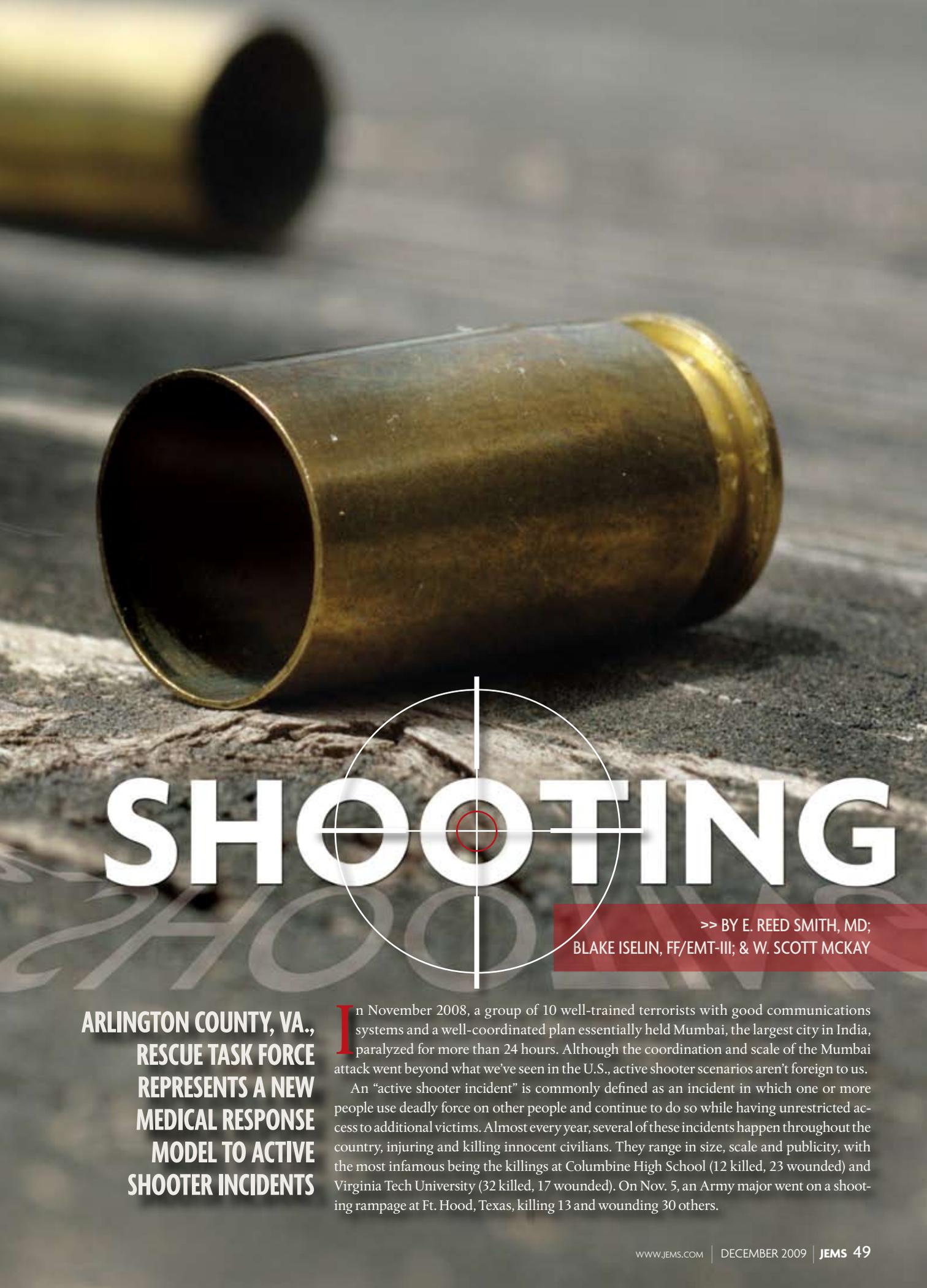


**TOWARD
THE
SOUND
OF**



SHOOTING

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**ARLINGTON COUNTY, VA.,
RESCUE TASK FORCE
REPRESENTS A NEW
MEDICAL RESPONSE
MODEL TO ACTIVE
SHOOTER INCIDENTS**

In November 2008, a group of 10 well-trained terrorists with good communications systems and a well-coordinated plan essentially held Mumbai, the largest city in India, paralyzed for more than 24 hours. Although the coordination and scale of the Mumbai attack went beyond what we've seen in the U.S., active shooter scenarios aren't foreign to us.

An "active shooter incident" is commonly defined as an incident in which one or more people use deadly force on other people and continue to do so while having unrestricted access to additional victims. Almost every year, several of these incidents happen throughout the country, injuring and killing innocent civilians. They range in size, scale and publicity, with the most infamous being the killings at Columbine High School (12 killed, 23 wounded) and Virginia Tech University (32 killed, 17 wounded). On Nov. 5, an Army major went on a shooting rampage at Ft. Hood, Texas, killing 13 and wounding 30 others.

TOWARD THE SOUND OF SHOOTING

>> CONTINUED FROM PAGE 49

In the past decade, the EMS community has spent a lot of time and effort training to increase awareness, detection and response capability for weapons of mass destruction. But we've failed to address what could possibly be the greatest threat for mass casualty—the well-armed, well-supplied lone gunman who is willing to or intends to die in the act of killing and injuring others, including fire and EMS responders.

Other first responder groups have addressed this issue. After the Columbine High School shooting in 1999, police agencies across the country addressed what appeared to be failures in their tactical response to active shooter scenarios. They developed proactive response plans, which established a

They're now trained to "move toward the sound of shooting."

In contrast, fire/EMS hasn't followed suit. The current standard fire/EMS response to the active shooter is to stage in a secure location until police mitigate the threat and secure the area to create a scene safe for fire/EMS operations. But there's a basic problem with this response: While waiting for a secure scene, those injured inside the building aren't receiving care and are dying from their injuries.

In our agency in Arlington County, Va., we recognized this weakness in our EMS response during after-action briefings for a large active shooter drill in which EMS assets were staged for more than an hour before police declared the scene safe for medical



ACFD medic in full gear with Hornet Tactical Vest and Special Operations Helmet.



Front of Hornet Tactical Vest showing ACFD patches and MOLLE pouches.



Rear of Hornet Tactical Vest showing the RTF patch and MOLLE webbing.

standard that's now commonplace. Prior to Columbine, the police model was to cordon off the area and wait for the arrival of a SWAT team to engage the threat. In most circumstances, this process allowed the shooter to continue to be active inside the perimeter and led to a significant delay in getting victims to medical care.

In a paradigm shift following Columbine, police departments moved to an aggressive response in which police immediately pursue, establish contact with and neutralize the shooter; the idea is that the sooner the shooter can be contained, captured or neutralized, the fewer the casualties.

To meet this objective, first responding patrol officers organize and deploy in three- or four-person teams as soon as they arrive on scene; they move quickly through unsecured areas, bypassing the dead, wounded and panicked citizens with the goal of engaging and eliminating the active threat.

operations. Subsequently, in conjunction with the Arlington County Police Department, members of the Arlington County Fire Department developed a new EMS response to active shooter incidents—the Rescue Task Force (RTF)—that takes the current military medicine model of Tactical Combat Casualty Care (TCCC) and applies it to civilian EMS.

The goal of this response is to get medical resources to the patient's side within minutes of being wounded while continuing to mitigate provider risk. Although our tactical medics were already familiar with TCCC, we felt this small group was limited by their primary role of working directly with our SWAT team and would likely be delayed in their deployment to the scene. The Rescue Task Force, similar to the police response to active shooters, must be implemented almost immediately. So, in order to fully implement the concept, we trained all of our paramedics in TCCC and the operational aspects of the RTF.

THE BASICS OF TCCC

Tactical Combat Casualty Care represents significant advancement in prehospital battlefield care. After the Battle of Mogadishu in 1993 (represented in the movie and book *Black Hawk Down*), U.S. Navy Capt. Frank Butler, USN MC; Lt. Col. John Hagman, USA MC; and Ensign George Butler, USN MC, wrote a landmark paper that defined the concept of TCCC and changed the paradigm of how medical care was applied on the modern battlefield.¹ Taking into consideration the limitations due to the austere conditions inherent in combat, TCCC essentially defines a set of principles and medical practices aimed at decreasing preventable deaths at the point of wounding. It defines what needs to be done immediately and in what order.

TCCC is evidence based and well supported by combat data. The Wound Data and Munitions Effectiveness Team study (1967–1969) examined combat wounds from the Vietnam

War and found that approximately 20% of all soldiers killed in action died from extremity hemorrhage, tension pneumothorax or airway obstruction, all of which are readily treatable in the field without extensive equipment or medical support.² Similar findings were reported in a 1984 study: 9% killed in action from exsanguination from extremity wounds, 5% killed in action from tension pneumothorax and 1% from airway obstruction.³ Although these wounds are all readily treatable, they're very time sensitive. Any delay in treatment will increase the risk of mortality; thus, the best chance for survival after ballistic wounding is with a response configuration that puts medical care at the patient's side within seconds or minutes. "Far-forward" placement of medical assets is therefore essential. The success of such aggressive application of medical care has been proven in the U.S.' current conflicts, with survival rates of 90% in Operation Iraqi Freedom and Operation Enduring Freedom.⁴

The overriding principal in TCCC is to perform the correct intervention at the correct time in order to stabilize and prevent death from the readily treatable injuries. For the civilian provider, this approach requires a shift in thinking. Airway control is not the first priority. Not only are exsanguinating extremity wounds far more common than airway injury, but a person can bleed to death from a large arterial wound in two to three minutes, while it may take four to five minutes to die from a compromised airway. Therefore, in TCCC, life-threatening bleeding is addressed first, followed closely by airway control. Open chest wounds and tension pneumothorax are of concern as well, but they generally don't cause mortality for 10–15 minutes, so they're addressed third. In TCCC, the traditional ABC mnemonic (for airway, breathing, circulation) is replaced by CAB (for circulation, airway, breathing).⁵

Because supplies and resources are limited in combat and austere environments, medical treatment and stabilization must be done expediently with minimal supplies. Tourniquets are emphasized and prioritized as a quick and effective method to control extremity hemorrhage. This practice is based on retrospective medical data that refutes the prevalent civilian EMS doctrine regarding their use and complications. Multiple studies and case reports from Iraq, Afghanistan and Israel have shown the safety of tourniquet use, especially when they can be discontinued within one to two hours.^{6–11} Although patient evacuation may be delayed hours or even days in a military combat zone, in civilian active shooter scenarios, patient evacuation is usually performed within 60–120 minutes and definitive medical care is often easily accessible after evacuation. Thus, for any exsanguinating hemorrhage, tourniquets can be applied immediately and quickly de-escalated once the patient is evacuated to a higher level of care.

For non-exsanguinating hemorrhage, mechanical pressure dressings with wound packing are used. Some wounds, including those in the femoral triangle or in the neck, are not amenable to tourniquets. These wounds are controlled using hemostatic agents, such as Celox, QuikClot ACS and HemCon, in conjunction with direct pressure. These agents enhance the coagulation cascade and increase clotting through local mechanisms in the wound itself. Although the initial versions of the hemostatic granules had morbidity from the exothermic reaction with blood in the wound, the newer versions of these chemicals have addressed and resolved this complication.

For airway control, nasopharyngeal airways are emphasized over

TOWARD THE SOUND OF SHOOTING

>> CONTINUED FROM PAGE 51

PHOTOS COURTESY ARLINGTON COUNTY FIRE DEPARTMENT



RTF medics evacuate an injured “patient.” The police officer providing front security is shown leading the team down the hall. Police officers are tasked with security and movement of the team; thus, they do not lift, carry or assist the medics in any way that would distract from their primary mission.



During this active shooter drill, an RTF medic treats a patient while an RTF officer provides security. The person in the red vest is a drill evaluator. Not shown are the other medic and officer on this team, directly on the other side of the hallway.

oropharyngeal or endotracheal intubation; nasal airways are fast, stable and effective in all unconscious or altered mental status patients, regardless of the presence of a gag reflex. Intubation is de-emphasized because it requires extra equipment and loss of situational awareness. If more definitive airway control is needed, blind insertion devices and cricothyrotomy are the procedures of choice. For breathing, re-establishing chest wall integrity with an adhesive occlusive chest seal and early management of tension pneumothorax is emphasized. Because tension pneumothorax can be difficult to recognize in the uncontrolled setting, aggressive and proactive use of needle chest decompression is used in patients with thoracic injury and respiratory distress.

TRANSLATION TO CIVILIAN CARE

After examining the weapons used by active shooters, the patterns of morbidity/mortality, and the medically austere conditions in which active shootings have taken place, it became clear to our department that civilian active shooter scenarios presented similar conditions and injuries as in combat.

The approach to redefining our medical response to these scenarios is based on the same concept used by firefighters involved in an interior attack on a structure fire: The risk is mitigated by proper equipment, training and tactics. Understanding that time to care is the key to saving lives, EMS personnel must get into the scene of an active shooter as quickly as possible to provide rapid stabilization. It's no longer acceptable to stage and wait for the affected area to be cleared by the police; doing

so defeats all principals of TCCC and can result in a number of preventable deaths.

The RTF is essentially a simple response model made up of multiple four-person teams that move forward into the unsecured scene along secured corridors to provide stabilizing care and evacuation of the injured. Each team consists of two police patrol officers to provide front and rear security, and two medics to stabilize patients using TCCC principles and equipment. In addition to the security of the escorting officers, these medics are outfitted in ballistic vests and helmets to further mitigate the risk of operating in this environment. Based on daily staffing in Arlington County, a total of seven RTFs can be formed at any time, each equipped to carry enough supplies to treat up to 14 victims, depending on their injuries.

Using input from military and medical subject matter experts and considering the operational limitations of the RTF mission, reliable, well-constructed and user-friendly medical and personal protective equipment was chosen and purchased with grant funds secured from the Metropolitan Medical Response System. The following is a list of what was chosen for the RTF:

PERSONAL PROTECTIVE EQUIPMENT

- >> Level IIIA Hornet Tactical Vest from Protective Products International with Level IIIA biceps protectors
 - > Lightweight with a large amount of overall chest and back coverage
 - > MOLLE webbing across chest for easy attachment of equipment carriers

- > Adjustable in size to fit all medics in the department
- > Identification with large Arlington County Fire Department patch on front and biceps protectors, as well as 'RESCUE TASK FORCE' on back (see p. 50)
- >> Level IIIA Special Operations Helmet
 - > Lightweight with high-cut back for greater range of motion
 - > Four-point harness to prevent helmet from sliding over eyes during patient care

MEDICAL EQUIPMENT

- >> TQS Medical Emergency Tourniquet (MET)
 - > Open loop system with solid construction
 - > One-handed operation
- >> H Bandage from H&H Associates
 - > Firmly secured pressure device and solid construction allows for greater amounts of pressure and easier application
- >> Bolin chest seal occlusive dressing
 - > Strong gel-based adhesive allows for easy fixation and stability during transport
- >> QuikClot ACS hemostatic agent
 - > New formulation of the Zeolite with decreased exothermic properties
 - > Small gauze pouch design eliminates powder issues and can be used as wound packing
- >> 14 gauge 3" needles for chest decompression
 - > Current recommendation of Committee for TCCC for use of longer needle

RESPONSE TEAM IN ACTION

If an active shooter incident occurs in Arlington County, the first four or five responding police officers quickly form an initial contact

team and enter the building; this is the standard police response. This contact team moves quickly to the sound of the shooter, bypassing wounded victims and other threats in an attempt to eliminate the most immediate threat. In doing so, they essentially clear a corridor into the building and relay important reconnaissance information back to command. Although these officers don't provide direct assistance to the wounded, they identify the need and call for the RTF.

Once this need is identified and communicated to police command, the RTF is formed with two police officers providing security for two medics as they move into the building down the corridor secured by the initial contact teams. Although directly under police command, the RTF is essentially a unified command asset. Once inside the building, the RTF police officers are directed through the incident commander to move the medics to the injured victims identified by the initial contact teams.

RTF communication functions on two different radio zones: 1) the RTF police officers communicate with police command, giving such information as location of the team within the building and receiving updates on location of the injured, the contact teams and possible threats; 2) the RTF medics communicate with fire command to report the number of victims and injuries. This dual communication allows for accountability and effective use of the teams as well as for planning and management of both the external casualty collection point and additional EMS resources.

The first one or two RTF teams that enter the building move deep inside to stabilize as many victims as possible before any one victim is evacuated. As victims are reached, the RTF police officers provide security in place while the medics treat the victims. Using the concepts of TCCC, they stabilize only the immediately life-threatening wounds on each patient they encounter, but leave these patients where they are found and move on.

The number of victims that can be stabilized by these initial RTF teams is limited only by the amount of supplies carried in. Once out of supplies, teams start moving back out of the building, evacuating patients they've treated. At the same time,

TOWARD THE SOUND OF SHOOTING

>> CONTINUED FROM PAGE 53

additional RTF teams are formed as personnel become available; these teams are brought in with the primary mission of evacuating the remaining stabilized victims. They can also be tasked to move further into the building in a “stabilizing but not evacuating” mode to take over for the initial RTF teams that have run out of supplies and begun evacuation.

A supply depot is set up near the entry point to the area of operations to allow for quick resupply and turnaround for RTF teams. If needed, an internal casualty collection point will be set up near a secure entry point, where casualties can be grouped to allow for faster and more efficient evacuation by non-RTF EMS

and command/control. The largest of these drills was a full-scale, multi-jurisdictional simulation of a multi-victim high school shooting similar to the Columbine incident. Using a local high school, multiple victims with moulaged ballistic and blast injuries were spread over a large area, simulating a scenario in which shooters moved indiscriminately throughout the school. Additional fixed threats, such as improvised explosive devices (IEDs) that required integration of bomb mitigation squads and limitation of ingress/egress, were also added.

In this drill, the RTF proved feasible and effective. The initial police contact teams

stated the effectiveness of rapid medical intervention via forward placement of medical personnel. Because of prior shootings on that campus, both of the local SWAT teams near Virginia Tech were active, and each had a tactical medic assigned and present with the team. Thus, when the call went out, both teams were formed up, nearby and ready to respond. The teams were inside the building within 12 minutes of the first 9-1-1 calls.

These medics quickly set up an internal casualty collection point and began triaging and stabilizing the injured as they were moved there by officers. Those treated and stabilized with probable life-saving inter-



PHOTOS COURTESY ARLINGTON COUNTY FIRE DEPARTMENT

Example of some of the medical gear carried by an RTF medic. See p. 52 for a complete list of supplies carried.



RTF medics treat another patient outside the entrance to the building during a scenario. Police officers providing front and rear security are not shown.

personnel. All patients are eventually evacuated to an external casualty collection point well outside the building in a secure location where traditional EMS care is initiated.

SKILLS & DRILLS

Since RTF inception, we've conducted monthly training on the application of care according to TCCC principles, the new personal protective and medical equipment, and RTF operational considerations. Every paramedic in the county, regardless of assignment to engine company or medic unit, is capable of functioning on the Rescue Task Force. For police, the RTF represented a paradigm shift as well; thus, training sessions to teach the concept, the role of security and movement for the medics, and operational details of command and control were held for all patrol and command officers.

Several successful drills have since been conducted to reinforce the concept, training

requested the RTF within 10 minutes of entering the building; four RTF teams were deployed into the building, and within 30 minutes, all 44 victims had been stabilized and evacuated to the external casualty collection point. This drill reinforced the fact that, using the RTF concept, a large number of severely wounded patients scattered through a large building could be effectively and efficiently treated and evacuated before law enforcement cleared the entire building. In comparison, using the traditional EMS response in a similar drill that year, the first patient contact wasn't until more than 90 minutes into the drill, and overall, it took more than 2.5 hours to clear the building of patients. Without question, after 2.5 hours, many would have succumbed to their injuries.

VIRGINIA TECH LESSONS

The response to the shootings at Virginia Tech University on April 16, 2007, demon-

strations included a young man with a femoral artery injury that was controlled with a tourniquet and a young woman who had a tension pneumothorax relieved by needle chest decompression.

The entire building was declared clear by the tactical teams after 29 minutes, and only then did the rest of the local medical response enter in full force. In this case, although small and limited, the forward medical component was able to apply stabilizing and life-saving interventions near the point of wounded.

Overall, this was an improvement over other incident responses, but two points should be clarified. First, the availability of SWAT teams that day was by chance, only due to the prior activation of the team. On any other day, neither team would have been formed up and available to respond with a tactical medic within 12 minutes. Second, patrol and tactical officers were still required to evacuate the injured to an internal

collection point and then out of the building. Essentially, this process left fewer officers available to perform a secondary search for additional shooters, explosives or other threats.

CONCLUSION

The Rescue Task Force, using the proven military medical concepts of tactical combat casualty care, is a proactive response to a real threat that every fire/EMS department in this country faces. As recent events have shown, the threat of coordinated small arms attacks in public places is not only real but likely in the current global economic and political environment. Prehospital medical response must change the current model of waiting for a secure scene, even though this may involve assuming a higher level of risk. Risk is nothing new for us; every day, we risk our lives to save people from dangerous situations, doing it with a safety net of protocols, training and equipment. The Rescue Task Force concept does the same, using a safety net to move fire/EMS to a new standard. [JEMS](#)

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Lessons from the Battlefield
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