



**Arlington County EMS paramedics partake in an active shooter scenario drill at a local school. Responders practice treating and evacuating injured victims.** Photo E. Reed Smith

# A NEW RESPONSE

## Supporting paradigm change in EMS' operational medical response to active shooter events

By **E. Reed Smith, *Jr.***, MD, FACEP & **John B. Delaney**, MS, EMT-B

The tragedies in Aurora, Colo., Newtown, Conn., and most recently at the Navy Yard in Washington, D.C., add to the growing epidemic of mass killings in our society. Such events have brought to light the real risk—and absolute horror—of what law enforcement and Fire/EMS responders must be prepared to face. These events have spawned initiatives and opened conversations at high levels of government that used to be non-starters, and the prospect of change and progress in the legislation to control illegal access to lethal weapons and improve mental health resources has the most realistic chance of being enacted in several years.

Yet among all the rhetoric for new regulations, there's only now dialogue regarding the operational medical response to these events about how and where improvements and progress can be made. Although the law enforcement tactical response paradigm changed after the Columbine High School massacre in 1999, fire/rescue and EMS operations have been slow to change from the historical stage-and-wait for safe operations approach.

### LEARNING FROM HISTORY

The historical perspective on mass killings and active shooter incidents is overwhelming. According to a December 18, 2012, *USA Today* report, 774 people were killed in mass shootings from 2006–2012, including 161 children under the age of 10. The frequency of these events is disturbing, and it certainly appears these attacks are occurring in increasing numbers and severity. In our post-9/11 disaster-aware public culture, local, state and federal governments are mandating facility response plans and drills, creating training programs for schools and businesses, and funding distributed education training, like YouTube videos on how citizens should respond to an active shooter or mass killing. However, only recently has funding been available and has any guidance been produced for the operational Fire/EMS response community.

The law enforcement community changed its response paradigm to active shooter and mass killing events after the tragedy at Columbine High School in 1999. Prior to Columbine, the standard law enforcement response to active shooters and mass-killing events was focused on the "five Cs": contain, control, call SWAT, communicate with the perpetrator, come up with a tentative plan. Based on the belief these events were actually hostage barricades where the perpetrators wanted something specific and didn't have an intent to kill, the initial patrol response was to rapidly create a hard perimeter *Continued on page 49*

>> CONTINUED FROM PAGE 48

around the incident site, evacuate those who could be easily evacuated, and establish communications with the perpetrators while waiting for the special tactical response assets to arrive. By the standards of the time, the law enforcement response to the Columbine massacre was tactically correct. However, the resultant negative public opinion and the strong criticism by the Governor Bill Owens' Columbine Review Commission[1] were drivers for law enforcement response paradigm change.

Common sense, as well as law enforcement research at the time, proved the rapid emergency deployment model as an effective way to limit "trigger time." Essentially, without rapid intervention, a single unchallenged shooter could acquire, target and shoot a new victim about every five seconds.[2] Therefore, "time taken by first responders equals casualties."[3]

As a result, since 2000, the accepted standard operational law enforcement response to the active shooter is the rapid deployment of the first-arriving patrol officers on scene. These basic patrol officers, not highly trained SWAT officers, immediately form two- to four-man contact teams and move aggressively to contain or eliminate the shooter. Using impromptu intelligence from victims and persons evacuating, these teams bypass locked doors and move toward the sound of shooting to contain or eliminate the shooter.

What's now being found with the rapid deployment model is that these events are ended very quickly by the aggressive response, even if it the police response is only a single individual.[4] The majority of the perpetrators either gives up or commits suicide at the first sign of police activity.[5] In fact, a recent report on active shooter events showed that, on average, active shooter incidents are less than 12 minutes, with many as short as 3–4 minutes,[6] and that, given the average 10-minute police response, more than 93% of the incidents on school campuses were finished prior to the arrival of law enforcement.[7]

**A Metropolitan Police Department officer walks near the Washington Navy Yard after at least one gunman launched an attack, spraying gunfire on office workers in the cafeteria and in the hallways at the heavily secured military installation.** AP Photo/Jacquelyn Martin

## THE PARADIGM

The Fire/EMS medical response paradigm to such events, however, hasn't evolved to meet this new threat. To note, there has yet to be a true sentinel event in the public realm to bring to light the shortcomings of the current Fire/EMS approach; thus, the impetus for change may not yet be at critical mass.

At the heart of the current Fire/EMS response paradigm to active shooters is the concept of staging assets off-scene and waiting for operations to begin once the scene is declared safe by police. This concept of "Scene Safety" is one that is ingrained in all Fire and EMS personnel from the earliest stages of recruit school and operational training. Rightfully so, this paradigm has grown through attempts to keep preventable injuries and loss of life in responding personnel to a minimum during operations that are typical to the Fire/EMS service.

The rift comes when this paradigm is applied to this new threat scenario, and the primacy of absolute scene safety for first responders in lieu of mitigated risk acceptance comes at the expense of the injured civilian.

## MILITARY EXAMPLE

As with most changes in civilian operational medical response, one can look to the U.S. military combat medical experience for information and examples. The paradigm response for combat medicine over the past 15 years is strongly evidence-based and hinges on placing medical care at the patient's side within a "few seconds to minutes of wounding."[8]

Historical combat medical data shows that, in penetrating trauma, there's a predictable death curve where the majority of those with fatal combat injuries die within 30 minutes of wounding. In the Wound Data and Munitions Effectiveness Team study after Vietnam, it was concluded that, in combat, 42% of deaths occur immediately, 26% occur within 5 minutes, 16% between 5–30 minutes, and 8–10% within 2 hours. In fact, only 10% of all the combat deaths in this study occurred once medical care was initiated on the wounded.[8]

This article further supports and expands on the idea that EMS should be prepared for anything in the event of a mass shooter, which was first talked about in the September article "Crosshairs on EMS: Responding to MCIs caused by low-tech terrorism," by Eric Dickinson, NRAEMT, BS. For additional details on how EMS responded to mass shooter incidents such as Columbine and the Virginia Tech Massacre, as well as more information on operating inside hot, warm and cold zones, scan the QR code or visit **www.jems.com/crosshairs-on-ems**.

>> CONTINUED FROM PAGE 49


**Law enforcement personnel are seen outside the Washington Navy Yard. Officials said several people were killed and more were wounded, including a law enforcement officer. AP Photo/Susan Walsh**

Essentially, every minute with uncontrolled injury increases the death rate, so rapid application of medical stabilization of the wounded is lifesaving. The primacy and effectiveness of this point-of-wounding care continues to hold true when reviewing all of the current combat medical data. Given this, in the current war on terror, the military's operational medical emphasis is on training every combat soldier in simple basic lifesaving skills to be applied as soon as tactically feasible, followed by rapid evacuation to care. For example, the early application of hemostatic dressings, tourniquets and management of sucking chest wounds and tension pneumothorax is critical.

Although this military model may not be feasible in a civilian setting, the need for timely stabilizing medical care and evacuation despite ongoing operations should not be lost. As with the idea of rapid tactical police response, this seems to be relative common sense: the sooner the first responders initiate rescue and treatment of the wounded, the greater the chance that the victims will survive. EMS personnel in the forward warm zone and law enforcement personnel in the hot zones should be equipped with tourniquets, pleural decompression needle devices, and occlusive and hemostatic dressings.

## ASSESSING RISK

The most common argument against Fire/EMS warm zone operations in active shooter/active killing scenarios is that "operating in an unsecured environment is too much risk for the responders to assume" and "scene safety is paramount above all other considerations." The amount of assumed risk in these active shooter scenarios is thought to be too high to accept.

However, because the greatest immediate threat to first responders in an active shooter scenario—the shooter—is rapidly incapacitated in almost all incidents prior to both police and Fire/EMS response,[5] the true risk to Fire/EMS personnel operating in "clear" but not "secure" areas, so called warm or indirect threat zones, is very low.

Risk comes in many forms for the Fire/EMS service, and there's an apparent conflict in the thought process that allows acceptable risk in some scenarios but not in others. It's a well-known fact that there's great risk to the well-being of the responder in every fire that is fought. Over the past 30 years, over 3,000 fire fighters have died performing what is considered to be one of, if not *the*, most dangerous professions.[9] The same holds true for non-Fire EMS providers; A study from 2005 showed an average of 5,000 ambulance crashes per year, one paramedic killed and injuries in the thousands per month.[10]

The Fire/EMS paradigm and the culture of Fire/EMS responders appear to only accept risk when responding to certain common operational scenarios, and to reject risk in the name of safety in other non-conforming scenarios. In reality, risk is risk and a line-of-duty death is both heroic and tragic regardless of the scenario in which it occurred.

Ironically, 'acceptable' risk in some normal operations is unnecessary given the solid evidence that shows there's little if any benefit to those actions, while the 'unacceptable' risk in active shooter response is bearing out to be well less than what was imagined. In a study of those responding to active shooter events over 33 years, only four incidents were documented where first responders were killed or injured.[6] More recently, there have been four significant responder injuries in active shooter incidents: Sergeant Kimberly Munley shot during the 2009 Ft. Hood response;[11] Lt. Brian Murphy shot responding to the 2012 Sikh Temple shooting in Wisconsin,[12] and during the initial response to the Navy Yard shooting this past September, both Officer Scott Williams who was shot in the legs, and a second un-named officer shot twice in the chest but protected by his ballistic vest.[13]

This low number of injured responders is even more significant in that these were the law enforcement responders aggressively pursuing and engaging the perpetrator in the direct line of fire, not Fire/EMS responders working behind the contact teams in areas that have been cleared but not secured. To put it in perspective, during the same time period of the four most recent officers injured, from November 2009 to September 2013, over 269 line firefighters were not just wounded as the officers above, but were killed in the line of duty.[9]

As part of the scene safety argument, opponents often cite the concern for a delayed ambush, with a second perpetrator lying in wait to specifically target the Fire/EMS response after the initial police contact teams have moved through the area. This is also unfounded. Out of all the documented active shooter incidents in the United States, there have been only 2 cases where there was more than one shooter, the attack on Westside Middle School in Jonesboro, Ark., and the tragedy at Columbine High School.[14]

Using a common-sense approach, one can surmise that it's far more difficult for two persons to have the desire to initiate a heinous attack, effectively plan without discovery, and have enough of an understanding and real time operational awareness regarding the operational response to successfully complete such a delayed ambush. Lying in wait is the exact opposite of what appears to be the psychology and the apparent objective of these attacks: to create havoc and kill as many as possible.

Police research into the common characteristics of the active shooter profile demonstrates that an ambush scenario on the responders working behind the contact teams is highly unlikely:

"They generally try to avoid police, do not hide or lie in wait for officers and typically fold upon armed confrontation …They choose unarmed, defenseless innocents for a reason: they have no wish to encounter someone who can hurt them. They are personally risk- and pain-avoidant. The tracking history of these murderers has proved them to be unlikely to be aggressive with police or other responders. If pressed, they are more likely to kill themselves."[4]

Choose XX at www.jems.com/rs

>> CONTINUED FROM PAGE 50


**In this training scenario, EMS and law enforcement practice responding in warm zone operations with staged school shooting including 35 injured patients spread around the school and a barricaded suspect in library.** **Photo E. Reed Smith**

Understanding this human behavior, it becomes clear the risk of a delayed ambush amid an active law enforcement response is small and doesn't even begin to outweigh the benefit of rapid rescue and medical care to the wounded. However, the possibility, no matter how miniscule, remains; thus, Fire/EMS warm zone medical and rescue operations should always be conducted with proper ballistic PPE and coordinated with law enforcement.

## WORKING WITH LAW ENFORCEMENT

Because active shooter response at least initially belongs to law enforcement, some feel these responders should be responsible for evacuating the wounded to staged Fire/EMS assets. But law enforcement bears a heavy burden in this type of response. Officers are a limited resource and shouldn't be required to be the only response asset to initiate rescue and medical operations. Even with a maximal response by law enforcement personnel, in a scenario with high numbers of casualties, the likelihood of having the required numbers to complete the immediate tactical objectives as well as stabilize and expeditiously evacuate the wounded is highly unlikely.

This means in systems where law enforcement or Fire/EMS rejects the idea of coordinated medical operations in areas of higher risk, seriously wounded but survivable victims could die while the primary tactical objectives are being addressed.

Additionally, unless specifically trained and carrying the proper equipment, the vast majority of law enforcement officers are unable to provide even basic medical stabilization of the wounded prior to evacuation.[5] This means the injured victim who's rapidly exsanguinating from a thigh wound will continue to exsanguinate during evacuation by law enforcement from the point of wounding to the "safe" area, even if it's a secure internal casualty collection point where medical assets are staged.

The theater attack in Aurora demonstrated the need for forward-deployed Fire/EMS medical operations. Although not a criticism of the response, the fact is that there were not enough medical or rescue personnel in the warm/indirect threat zone soon enough after the attack and police officers had to switch from primary tactical response to rescue/medical. Half of the victims transported to hospitals that night were in the back of police cars.[15]

The fact also remains that those injured victims received no medical care during transport, and that, with each police-initiated transport, there was one or two less law enforcement officers on scene to assist with completing tactical law enforcement objectives.

Having no medical personnel in the warm zone means that little treatment is being done for the wounded, and that stabilizing and often lifesaving care will be significantly delayed. In light of the available data discussed above and actual risk profile, overadherence to a culture of absolute safety for responders will likely have a detrimental effect on the wounded survivors. The low risk of danger to the responder is clearly outweighed by the benefit for the patients.

The paradigm shift in operations in the London Fire Brigade (LFB) is a perfect example of high-risk medical operations. Highly criticized after the July 2005 attacks on the London Underground subway system, the LFB has adopted a more aggressive approach to operating in areas of higher risk that relies on real-time risk/benefit assessment by on-scene commanders.[16] Despite official vindication in the Coroner's Report,[17] the public outrage of the response paradigm that kept responders from early rescue operations during the bombings forced this change. As such, in the years leading up to the 2012 London Olympic Games, London Fire Brigade researched international best practices and worked with their operational partners to develop and implement a new approach to high threat scenarios.[16] The London Fire Brigade should be applauded for their current approach to indirect threat scenario operations including aggressive police/Fire integration for medical rescue and fire suppression.

## WORKING WITH SWAT

But what about the tactical paramedics embedded with SWAT or other specialized response teams? Both Fire/EMS and law enforcement command often use the specially trained tactical medics as the answer/alternative to any calls for paradigm shift to initiate warm zone medical operations. These medics are trained to work in high-threat environments and, if immediately available, are exceptionally useful and appropriate for deployment in active shooter scenarios.

However, there are multiple issues with relying on tactical medics as the sole warm zone rescue/medical asset. First, in all but a few fulltime SWAT teams, tactical medics are part time and are therefore not always available. Even in full-time teams, because they respond as part of the SWAT package that has to be specially requested and assembled and is thus delayed in response, the on-scene time for law enforcement tactical medics will be slower than the first-responding Fire/EMS assets who are immediately deployed to the scene.

Second, tactical medics have a defined mission to provide medical support for the SWAT team officers; they certainly can initiate care

Choose XX at www.jems.com/rs

>> CONTINUED FROM PAGE 52

**Arlington County paramedics respond in an active shooter drill in a metro environment using TECC equipment.**
**Photo E. Reed Smith**

to the wounded, but as a whole, their primary mission is dedicated to the SWAT officers and the SWAT tactical mission, so they can't initiate mass wounding care until the primary mission of the SWAT team is completed.

And finally, tactical medics are an extremely limited resource, with most teams only having at most two during any operation. Imagine the effectiveness and ability of only two medics to deliver timely care and rapid evacuation in Aurora, with 58 persons injured and 12 dead.

## NEW STANDARD OF CARE

Another argument frequently heard against paradigm shift in the Fire/EMS response to active shooters is that indirect threat/warm zone care is outside the standard EMS protocols and, therefore, instituting such a paradigm would require a new standard of care and extensive training. Although care provided to the wounded in areas of mitigated threat requires a different approach than traditional EMS, this doesn't represent a significant and expensive training mandate. Because it doesn't require certification or proprietary medical courses, the implementation of the high-threat medical guidelines into medical operations can easily be developed on a local level or agency level.

The guidelines of Tactical Emergency Casualty Care (TECC), developed by a consensus group of civilian operational medical experts, represent simple evidenced-based and best-practices guidelines for care provided by any caregiver at or near the point of wounding during high-risk operations.[17] In lieu of the standard EMS approach, TECC offers threat-based care guidelines that uses the relationship between the provider and the threat to define the minimum of what is medically needed for lifesaving. Developmentally, TECC is the civilian-appropriate, civilian-guided translation of the successful military Tactical Combat Casualty Care (TCCC) guidelines. Although TCCC has already been taught to civilians through a variety of training programs, it's at its most basic a military doctrine of care. This creates significant issues when this military guidance is implemented carte blanch into civilian prehospital operations. TECC, on the other hand, is the direct civilian translation of TCCC, written by civilians for civilian use. TECC accounts for the aspects of the civilian setting and scope that doesn't exist in the military, including, among other things, common operating language across disciplines, scope of practice, liability, special populations and baseline health of the population.[18] It's not dogma, and allows for differences among different levels of providers, different scope of practice, and different operational systems. The TECC guidelines are essentially a set of bricks with which agencies can build an operational response that is unique and individually tailored to their operations, scope and protocols.

The last argument against Fire/EMS response paradigm shift comes down to history. Despite good evidence and a healthy dose of common sense supporting it, the resistant Fire/EMS agency administrators often push saying, "Well, that's not our incident and is just not the way we operate."

It's been said the Fire service is "200 years of tradition unimpeded by progress." Although this is clearly not the case, there may be a bit of truth to the statement, and EMS as a specialty isn't all that different. Fire/Rescue and EMS operations are based largely on apprenticeship-like training where we emulate what we have been told and shown by our superiors; this can lead to propagation of operations and procedures that are grounded in anecdotal experience, not evidence.

As a whole, human beings are uncomfortable with change. This natural resistance makes change slow and cumbersome, and requires time, patience and a lot of discussion. Change is never easy, especially when it addresses one of the earliest and most culturally entrenched ideas in operational response.

So, how should paradigm shift be addressed? The answer is to move forward with solid training, tactics and equipment to develop an operational paradigm that allows for medical operations in the setting of mitigated risk. The foundation for the paradigm must include all of the following: strong, well-developed and frequent training on the high-risk operations, the inherent risks and the mitigation strategies; sound tactics that are developed and vetted by the experts to allow for operations that reasonably mitigate the risk; and dependable user-friendly equipment that both assists in completing the task at hand and provides protection to give personnel confidence in their acceptance of risk. Solid training, tactics, and equipment will decrease the uphill climb that comes with overcoming operational inertia and, in the end, will help to ease the assimilation of new paradigm.

## CONCLUSION

When closely examining the arguments against paradigm shift, the clearer picture of the need for change comes into focus in light of the evidence available on the true risk and operational restraints. A new Fire/EMS response paradigm for active shooters must be implemented.

During active shooter/active killing response, the first arriving Fire/EMS

responders, not special operations or tactical medical teams, must accept the responsibility for life rescue and medical operations and must work with first-responding law enforcement assets to rapidly deploy into the areas that have been cleared but not secured (warm/indirect threat zones) to initiate treatment and rescue injured victims.

These operations must be coordinated with law enforcement patrol officers providing security for these personnel during operations. Fire/EMS must have appropriate medical supplies and equipment and should be trained in some basic law enforcement movement/tactics. And, these Fire/EMS responders must base their treatments on the medical principles of civilian Tactical Emergency Casualty Care to meet the situational standard for application of medicine in civilian high-threat scenarios. JEMS

**Evacuating a patient inside a school. Photo E. Reed Smith**

**E. Reed Smith, Jr.**, MD, FACEP, is the operational medical director for the Arlington County (Va.) Fire Department and an associate professor of emergency medicine at The George Washington University School of Medicine and Health Sciences. He may be contacted at rsmith@arlingtonva.us.

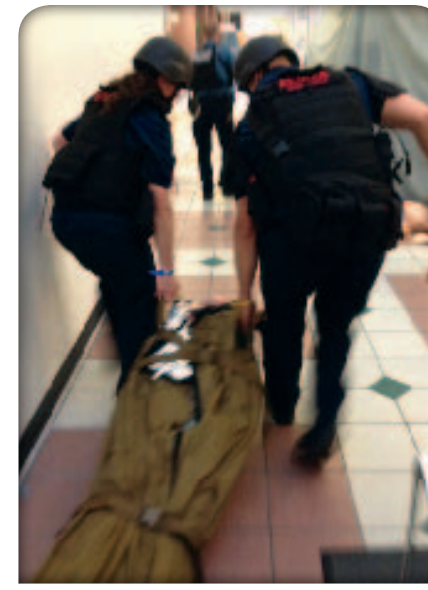
**John B. Delaney**, MS, EMT-B, is a fire captain II with the Arlington County (Va.) Fire Department. He may be reached at jdelan@arlingtonva.us.

EMS TODAY The JEMS Conference & Exposition

**Learn more from E. Reed Smith at the EMS Today Conference & Expo, Feb. 5–8 in Washington, D.C., EMSToday.com**

## REFERENCES

1. Columbine Review Commission. *The Report of Governor Bill Owens' Columbine Review Commission*. May 2001.
2. Rielage, RR. In the Line of Fire. *Fire Chief*. 2009;53(12):30.
3. Lightfoot, JD (February2013.) Rethinking active shooter response. *PoliceMag*. Retrieved Oct. 15, 2013, from www.policemag.com/channel/careers-training/articles/2013/02/rethinking-active-shooter-response.aspx
4. Force Science Institute SEALE Regional Training Academy Research (May 2008.) Ohio trainer makes the case for single-officer entry against active killers. *PoliceOne*. Retrieved Oct. 15, 2013, from www.policeone.com/police-products/training/articles/1695125-Ohio-trainer-makes-the-case-for-single-officer-entry-against-active-killers/
5. Blair JP, Martaindale MH. (2013.) United States active shooter events from 2000 to 2010: Training and equipment implications. *Alerrt.org*. Retrieved Oct. 15, 2013, from http://alerrt.org/files/research/ActiveShooterEvents.pdf
6. Simmons J. (2003.) Rapid deployment as a response to an active shooter incident. *Scribd.com*. Retrieved Oct. 15, 2013, from www.scribd.com/doc/16693309/Rapid-Deployment-as-a-Response-to-an-Active-Shooter-Incident.
7. Drysdale D, Modzeleski W, Simons AB. (April 2010.) Campus attacks: Targeted violence affecting institutions of higher education. *Secret Service*. Retrieved Oct. 15, 2013, from www.secretservice.gov/ntac/CampusAttacks041610.pdf.
8. Wound Data and Munitions Effectiveness Team. (1970.) *The WDMET Study*. Original data are in the possession of the Uniformed Services University of the Health Sciences, Bethesda, Md. 20814–4799. Three summary volumes contain extensive abstracts of the statistical data and can be obtained from Defense Documentation Center, Cameron Station, Alexandria, Va. 22304–6145.
9. US Fire Administration (n.d). Firefighter fatalities statistics and reports. Retrieved Oct. 15, 2013, from http://apps.usfa.fema.gov.
10. Ray A, Kupar D. Comparison of crashes involving ambulances with those of similar sized vehicles. *Prehosp Emerg Care*. 2005;(9):412–415.
11. Jankowski P. (Aug. 17, 2013). Kim Munley on Hasan: "We began to blindly exchange fire." *Killean Daily Herald*. Retrieved Oct. 15, 2013, from http://kdhnews.com/military/hasan_trial/kim-munley-on-hasan-we-began-to-blindly-exchange-fire/article_c8bb168e-0682-11e3-a6b1-001a4bcf6878.html
12. Fussman C. (Dec. 27, 2012). Lieutenant Brian Murphy: What I've learned. *Esquire*. Retrieved Oct. 15, 2013, from www.esquire.com/features/what-ive-learned/meaning-of-life-2013/brian-murphy-sikh-temple-shooting-0113.
13. Second police officer was shot at Navy Yard during attack, Lanier says. (Sept. 2013.) *WJLA*. Retrieved Sept. 24, 2013 from www.wjla.com/articles/2013/09/navy-yard-shooting-chief-lanier-talks-about-mass-shooting-94429.html.
14. New York Police Department. (Dec. 2012.) Active shooter: Recommendations and analysis for risk mitigation. Retrieved Sept. 24, 2013, from www.nypdshield.org/public/SiteFiles/documents/Activeshooter.pdf.
15. Aurora Fire Department. (n.d.) Century Theater shooting: Aurora Fire Department preliminary incident analysis. Retrieved Oct. 15, 2013, from www.auroragov.org/cs/groups/public/documents/document/015169.pdf.
16. Personal communication with London Fire Brigade, 2008.
17. Coroner's inquest into the London bombings of 7 July 2005. (May 6, 2011.) Retrieved Oct. 15, 2013, from http://webarchive.nationalarchives.gov.uk/20120216072438/http://7julyinquests.independent.gov.uk/docs/orders/rule43-report.pdf.
18. Callaway DW, Smith ER, Shapiro GL, et al. The committee for tactical emergency casualty care (C-TECC): Evolution and application of the TCCC guidelines to civilian high threat medicine. *J Spec Oper Med*. 2011;11(2):95–100.



**Paramedics practice responding to a mall shooting using a hypothermia kit and an APLS thermal guard stretcher. Photo E. Reed Smith**