The profile of wounding in civilian public mass shooting fatalities

E. Reed Smith, MD1, Geoff Shapiro, EMT-P2, Babak Sarani, MD3

1 Department of Emergency Medicine, The George Washington University, Washington, DC
2 Emergency Medical Services Program, The George Washington University, Washington, DC
3 Center for Trauma and Critical Care, Department of Surgery, The George Washington University, Washington, DC

Submitted: December 1, 2015, Revised: February 15, 2016, Accepted: February 16, 2016.

Corresponding Author:
Babak Sarani, MD, FACS, FCCM
2150 Pennsylvania Ave, NW
Suite 6B
Washington, DC 20037
Phone: 202-741-3188
Fax: 202-741-3219
Email: bsarani@mfa.gwu.edu

E. Reed Smith, MD: rsmith@arlingtonva.us
Geoff Shapiro, EMT-P: glshap@gwu.edu
Disclosures: Dr. Smith voluntarily serves on the Executive Board of the Committee for Tactical Emergency Casualty Care. Dr. Sarani voluntarily serves on the Board of Directors of the Committee for Tactical Emergency Casualty Care.

This work was presented at the 29th annual meeting of the Eastern Association for the Surgery of Trauma, January 9–12, 2016, in San Antonio, Texas.

Funding source: none
ABSTRACT

Background: The incidence and severity of civilian public mass shootings (CPMS) continue to rise. Initiatives predicated on lessons learned from military woundings have placed strong emphasis on hemorrhage control, especially via use of tourniquets, as means to improve survival. We hypothesize that both the overall wounding pattern and the specific fatal wounds in CPMS events are different than in military combat fatalities and thus may require a new management strategy.

Methods: A retrospective study of autopsy reports for all victims involved in 12 CPMS events was performed. CPMS was defined using the FBI and the Congressional Research Service definition. The site of injury, probable site of fatal injury, and presence of potentially survivable injury (defined as survival if pre-hospital care is provided within 10 minutes and trauma center care within 60 minutes of injury) was determined independently by each author.

Results: A total 139 fatalities consisting of 371 wounds from 12 CPMS events were reviewed. All wounds were due to gunshots. Victims had an average of 2.7 gunshots. Relative to military reports, the case fatality rate was significantly higher and incidence of potentially survivable injuries was significantly lower. Overall, 58% of victims had gunshots to the head and chest, and only 20% had extremity wounds. The probable site of fatal wounding was the head or chest in 77% of cases. Only 7% of victims had potentially survivable wounds. The most common site of potentially survivable injury was the chest (89%). No head injury was potentially survivable. There were no deaths due to exsanguination from an extremity.

Conclusion: The overall and fatal wounding patterns following CPMS are different than those resulting from combat operations. Given that no deaths were due to extremity hemorrhage, a
treatment strategy that goes beyond use of tourniquets is needed to rescue the few victims with potentially survivable injuries.

Level of evidence: Level IV

Study type: Care management

Keywords: active shooter, mass casualty, TECC
INTRODUCTION

The incidence and severity of civilian public mass shootings (CPMS) and mass killing events in the United States of America and worldwide continue to rise. Since the almost back-to-back, large and well publicized mass shootings in the latter half of 2012, there has been increased focus on improving survival for the wounded in active shooter events. Recently, several large public initiatives have placed much of the effort to address the loss of life through strong, unidirectional messaging on external hemorrhage control, with a special emphasis on the use of extremity tourniquets. For example, the Hartford Consensus Joint Committee to Create a National Policy to Enhance Survival in Mass Casualty Shooting Events views hemorrhage control as “second only to engaging and defeating the shooter and as key to improving the survival of victims of active shooter incidents”, describing external hemorrhage control as “the critical step” in eliminating preventable pre-hospital death. This guidance is driven by the combat wounding pattern and Tactical Combat Casualty Care (TCCC) medical lessons learned from past military action and re-confirmed over the last 14 years of the wars in Afghanistan and Iraq. However, in order to have an informed basis to develop appropriate civilian medical response algorithms for civilian public mass shooting incidents, there must be evidence that supports the premise that military and civilian wounding patterns and injuries are similar.

Systematic autopsy reviews of fatalities in the Vietnam war as well as in Operation Iraqi Freedom have revealed a consistent pattern of fatal injury in combat (figure 1), including specific injuries where the fatality could potentially have been prevented with simple, timely medical intervention. These ‘potentially survivable injuries’ historically make up 15% of all combat deaths and consist of exsanguinating extremity hemorrhage, tension/open pneumothorax, and...
airway obstruction\textsuperscript{6}. Of the three, exsanguinating extremity hemorrhage is consistently the most prevalent at 9\% and is arguably the least complicated to address, even by minimally trained personnel. Due to the prevalence of improvised explosive devices and the resulting dismounted blast injury pattern in Operation Iraqi Freedom and Operation Enduring Freedom, exsanguinating extremity and junctional hemorrhage has become a significant focus of care on the battlefield under the TCCC guidelines\textsuperscript{7,8}.

Given the last fourteen years of conflict, military trauma knowledge and experience are now being directly applied to the civilian setting. Trauma management training paradigms founded directly upon this military evidence are being taught to civilians as a solution for the gap in medical operations and medical knowledge in civilian response to high threat events. Unfortunately, despite high threat events being a recent significant focus of medical discussion, there has been no analysis of the pattern of wounding and fatal injury in CPMS events. We hypothesize that both the overall wounding pattern and the specific fatal wounds in these civilian events are different than in military combat fatalities. The purpose of this paper is to define the overall anatomic wounding pattern, the fatal wounding pattern, and the incidence of potentially survivable wounds in civilian public mass shooting fatalities.

**MATERIALS AND METHODS**

Both the Federal Bureau of Investigation and the Congressional Research Service define public mass shootings as (1) incidents occurring in relatively public places involving four or more deaths, not including the shooter(s); (2) gunmen who select victims indiscriminately; and (3) the violence in these cases is not meant to be a means to an end, such as robbery\textsuperscript{1,9}. Adopting
this standard definition, we used autopsy reports from CPMS events to examine both the overall anatomic distribution of wounds, the anatomic region of the identified fatal wound, and the percentage of fatal wounds that may have been potentially survivable with rapid medical intervention and expedient transport to definitive care.

The New York Police Department 2012 Active Shooter Summary Report provides detailed descriptions and data for every active shooter event in the United States since 1966\textsuperscript{10}. Using this compilation report along with the FBI report, A Study of Active Shooter Incidents Between 2000 – 2013\textsuperscript{1}, we identified 56 events that both met the definition of civilian public mass shooting and had an identifiable medical examiner or coroner whom we could contact through an internet-based search of the region/county/city of the shooting event. As a whole, we found that such details and contacts from events prior to the 1999 Columbine High School shooting were not well recorded online and therefore not accessible. Thus, any event where the medical examiner/coroner could not be identified or directly contacted was eliminated from the study. As such, the majority of the incidents that met our criteria were from the period of 2000 through 2013.

Once identified, the responsible medical examiner or coroner’s office was contacted and a Freedom of Information Act (FOIA) request was made for the autopsy/medical examiner report for each of the publically listed victims of the selected event. In cases where state law precluded the direct distribution of autopsy reports, a de-identified listing of autopsy findings and causes of death was requested. Three requests were sent by email for each selected event. A negative
response at any point or no response after three requests for information removed that event from the study database.

Once requested data was received, each author independently reviewed the reports to determine the anatomic region of every wound, probable site of fatal injury, and whether the wounds were potentially survivable assuming pre-hospital care within 10 minutes and definitive trauma center care within 60 minutes. These time to care data points were chosen to be consistent with current Pre-Hospital Trauma Life Support recommendations regarding the Platinum 10 minutes and the Golden Hour. Where there was not unanimous agreement, majority opinion ruled.

Wounds were analyzed and compiled by body region and type of injury. The particular body regions were separated according to the following criteria: the head region included all wounds of the head, the face region included all wounds of the face, the neck region included all wounds of the cervical spine and neck superior to the clavicles, the chest/upper back region included all chest injuries and thoracic spine wounds, the abdomen/lower back region included the lumbar spine, abdomen, pelvis, and external genitalia, and the extremities region included any injury below the shoulder region on the upper extremity and below the pelvis on the lower extremity. Wounds were considered fatal if they involved penetration of the heart; injury to any non-extremity major vasculature structure; transcranial, mid-brain or brainstem injury; or multiple solid organ injuries.
We sent FOIA requests for autopsies to medical examiners from a sample of 25 out of the 56 events that met study criteria. Two medical examiners denied the request, even for de-identified data, based on either state or local law, one denied the request due to lack of resources to compile the requested data, and ten of the requests were unanswered despite three attempts.

In two incidents, for a total of 46 fatalities, the medical examiner was only able to provide limited data. In one of these incidents, state reporting restrictions prohibited the release of the actual autopsies, even de-identified; in the other case, no actual autopsies were done. However, for each victim in both of these incidents, we were able to obtain reported cause of death and detailed external wound data (including location and number of wounds). Without the actual autopsy report, however, identifying the potentially survivable injury was unreliable. Thus, for these two events, we considered a victim to have a non-survivable wound if there was at least one direct penetrating transcranial wound. Of these 46 fatalities, 32 met this criterion. As wounds to the torso alone cannot be adequately assessed for potential survivability without knowledge of underlying pathology, the remaining 14/46 patients were excluded from the analysis for survivable injury. Additionally, in this dataset, 22/46 fatalities were included in the analysis of probable fatal anatomic wound as all wounds to each of these victims were to only one anatomic region. However, the other 24/46 fatalities had wounds to more than one anatomic region, thus we were unable to determine the exact anatomic region of the probable fatal wound in these victims. We excluded these 24 from the analysis of anatomic distribution of probable fatal wounds (figure 2).
RESULTS

We received autopsy reports and/or de-identified wounding data from 12 separate civilian public mass shooting events totaling 139 fatalities with 371 total wounds reported (includes potential entry and exit wounds) (table 1). Number of wounds on each fatality ranged from 1-10 with an overall average of 2.7 per victim. The overall anatomic wounding pattern, including both fatal and non-fatal wounds (figure 3), showed that the head and the chest/upper back were the anatomic regions most frequently involved as 58% of victims had at least one wound to the head and/or chest/upper back. Only 20% of overall wounds were to the extremity region and only 13.5% were to the abdomen/lower back region, suggesting that the shooters were accurate in their aim given that their intention was to kill. Fifty six percent of victims had concurrent wounds to more than one anatomic region (not limited to head and chest/upper back).

In evaluating the anatomic distribution of the probable fatal wound(s), the majority (77%) were also to the head or chest/upper back (figure 4). Furthermore, 90% of these victims had non-survivable injuries in a single anatomic region, suggesting that only 10% died of multisystem non-survivable injury. We did not find any extremity wounds that would have resulted in exsanguination and death.

With 100% agreement between reviewers, only nine out of the analyzed 125 fatalities (excluding the 14 without detailed autopsy data) were found to be potentially survivable, yielding a potentially survivable wound rate of 7% (table 2). There was near equal distribution between shotgun and handgun wounds in this group and no wounds caused by high velocity rifles. The most common potentially survivable injury was a gunshot/shotgun to the chest (89%)
with autopsy reports showing no significant vascular or cardiac injury and only small hemothorax. Lack of significant pathology in these cases leads us to deduce that the patient died from respiratory impairment or tension pneumothorax. There were no penetrating head wounds identified as potentially survivable as none of the reported head wounds were unilateral. Three cases had concurrent facial injury that may have contributed to the fatality, and one case had an isolated facial injury. No exsanguinating extremity hemorrhage was identified, leaving the chest and airway as the only anatomic regions that could have been temporized with relatively simple interventions at or near the point-of-wounding to allow the patient the potential to survive. Of the 14 cases excluded from this analysis for potentially survivable injury, all had wounds to the head with or without wounds to the torso; there were no wounds to the extremities in the excluded group.

DISCUSSION

There seems to be ready acceptance in the pre-hospital and trauma medical community of the assumption that, despite obvious operational differences, the wounding patterns, fatal injury, and required pre-hospital medical interventions are similar between combat and civilian public mass shootings. Although the tissue physiology of ballistic wounding and the resulting systemic physiologic response is the same, almost everything else between combat and civilian events is different. Thus, directed medical interventions following CPMS require a different overall strategy and therapeutic emphasis in order to decrease the number of potentially preventable deaths.
This is the first study that specifically examines the overall wounding, the fatal wounding, and the incidence of potentially survivable wounds following civilian public mass shootings. This dataset represents 25% of all fatalities and 15% of all CPMS events in the United States and US territories over the thirty years between 1983 and 2013. Our goal was to gain perspective on civilian fatalities in the same manner that Eastridge et al did for the modern battlefield in 2010. Through analysis of post-mortem autopsy reports of US combat fatalities, the authors in that study defined the patterns of fatal wounds in Operation Iraqi Freedom and Operation Enduring Freedom with a special focus on the incidence and nature of potentially survivable injuries. Comparing the results, we found that fatalities following civilian public mass shootings differ from combat fatalities in the mechanism of injury, overall wounding pattern, the fatal wounding pattern, and the percentage of potentially survivable injuries.

There are multiple reasons why these differences exist. To begin with, in addition to more prevalent use of high velocity weapons (i.e. rifles), explosives are more common in the military setting. According to Eastridge et al, the causes for lethal injuries in Iraq and Afghanistan combat operations were 74% blast/fragmentation, 22% gunshot wounds, and 4% other (vehicle crash, industrial, crush, etc.)12. Champion et al reported similar etiologies in combat injuries with 62% fragmentation injury, 23% gunshot wounds, 3% blast, 6% burns and 6% other6. None of the 12 events we studied involved injuries from blast, burns, or fragmentation; instead, 100% of the injuries in our database were due to gunshot wounds, including lower velocity handguns, multiple projectile shotguns, and high velocity rifles. This is consistent with other studies of civilian public mass shootings. For example, none of the events listed in the online Mother Jones magazine review of active shooter incidents from 1982 through 2015 involved injuries from any
other type of weapon\textsuperscript{13}. Blast injury alone causes a much wider array of trauma and, intuitively, is associated with a higher potential for exsanguinating hemorrhage.

The difference in the anatomic regions of wounds overall between combat and civilian public mass shootings is quite significant. The percentage of extremity injuries in combat has been reported to be between 52\% and 64\%\textsuperscript{6}. In contrast, only 28 of our 139 total civilians (20\%) had extremity wounds of any kind. Instead, civilians have a much higher percentage of head and torso injuries (72\% versus 48\% in combat). The likely reason for this is two-fold: first, the civilians killed in CPMS are not wearing ballistic protection for their head and/or torso leading to a higher incidence of injury to these anatomic regions. This effect can be seen in the distribution of overall injury in the torso alone. The ballistic armor worn by military personnel in combat protects the upper more than the lower torso, leading to a reported wound distribution of 36\% penetrating chest wounds versus 64\% abdominopelvic injury\textsuperscript{12}. In civilians without ballistic armor, however, these numbers are almost exactly reversed. Out of a total of 125 reported torso wounds in our study, 85 (68\%) were to the chest/upper back and 40 (32\%) were abdominopelvic injuries. Second, the average distance of the shooter in civilian mass casualty is, for the most part, much closer to the victim than the enemy combatant is from the soldier. In after action reviews from combat, reported engagement distances ranged on average from 20-30 meters\textsuperscript{14}. Civilian public mass shootings most often occur at a much closer range and most often indoors\textsuperscript{10}. The closer distance in civilian settings greatly improves the accuracy and ability for the shooter to hit center mass, thus creating a higher incidence of head and torso injuries. This scenario unfolded both in the 2007 Virginia Tech shooting and the Sandy Hook Elementary
School shooting, where the shooter quickly shot multiple times at close range without significant resistance from the victims resulting in numerous close range lethal head wounds\textsuperscript{15,16}.

Given these operational differences, the anatomic site of the fatal injury differs as well. For civilians, wounds to the head and chest were the most common identified sites of fatal injury, together accounting for 77\% of deaths. In combat, this number is lower at 61\%\textsuperscript{12}. However, combatants have a higher percentage of concurrent fatal injuries in multiple anatomic sites (17\% vs 10\%)\textsuperscript{6}. The increased prevalence of blast trauma with resulting multiple wounding mechanisms likely accounts for this higher incidence of multiple fatal wounds in the same patient, as opposed to the singular wounding pattern of a bullet or the tight pattern of shot from a close range shotgun creating fatal injury in a single anatomic region 90\% of the time in civilians.

Civilian public mass shootings overall are more lethal events with a significantly higher case fatality rate than combat. The case fatality rate (CFR) for our 12 events, defined as the percentage of fatalities among all wounded\textsuperscript{17}, was 44.6\%. Overall, from 2000 – 2013, the CFR for active shooting events as reported by the FBI was 46.5\%.\textsuperscript{1} In contrast, during Operation Iraqi Freedom and Operation Enduring Freedom, the CFR has been reported in certain military groups to be 10.04\% and 9.11\%, respectively\textsuperscript{18}.

The data derived from combat on potentially survivable wounds has been the focus of, and impetus for, the military medical recommendations that have been driving the recent initiatives to improve survivability in civilian active shooter events. The main focus of the military TCCC guidelines is to rapidly address potentially survivable and easily manageable
wounds at or near the point of wounding. However, we found that not only do CPMS events appear to be more lethal, there is also a much lower incidence of potentially survivable injuries as compared to woundings incurred during military combat operations. As reported by Eastridge et al., 24.3% of battlefield deaths were potentially survivable from a purely medical perspective\textsuperscript{12}. In our study, only 9 of 125 (7%) cases were found to be potentially survivable. Moreover, we found a significant difference in the specific injuries associated with potentially survivable wounds. As opposed to the 60% incidence of exsanguinating extremity hemorrhage and 33% incidence of tension pneumothorax in combat studies\textsuperscript{6}, chest injury with potential tension pneumothorax represented the vast majority (89%) of potentially survivable civilian fatalities. Additionally, in 4 of the 9 cases, non-lethal injury to the face was reported. Resulting airway obstruction may have contributed to the fatality, which represents an incidence of 44% versus the reported 7% in combat\textsuperscript{6}. And surprisingly, compared to 60% of preventable battlefield fatalities\textsuperscript{6}, none of the 139 autopsies showed exsanguinating extremity hemorrhage as a cause of death. Thus, although tourniquets and an emphasis on controlling external hemorrhage clearly save lives on the battlefield, these interventions may not have the same effect in improving survival after civilian public mass shooting events.

Does this mean external hemorrhage control for civilians is unimportant? Emphatically no! Tourniquets and simple hemorrhage control measures most definitely have a role in improving survival, but should no longer be a myopic focus of first responder and public education. According to our results, where chest injury by far predominates as the most common potentially survivable wound, a systematic approach that promotes not just hemorrhage control, but the entire spectrum of civilian Tactical Emergency Casualty Care (TECC) adjusted to the
scope of the provider may improve survival. Built upon civilian-specific application of military combat medical lesson learned, TECC consists of an evidence and consensus best-practiced based set of civilian focused medical recommendations for use of geographically involved citizen first care providers with application of simple interventions to stabilize a trauma patient at or near the point of wounding and coordinated first responder rapid access to and evacuation of the injured\cite{19,20}. Per TECC, in addition to immediate patient access and external hemorrhage control (direct pressure, tourniquets, and hemostatic agents), immediate medical care in the wake of a CPMS must include strategies to prevent further injury to the wounded, simple airway management, recognition and management of declining respiratory function as a result of penetrating trauma to the chest, proper positioning of the casualty, efficient movement of the casualty, and prevention of hypothermia\cite{21}. Simple training with that breadth of knowledge, along with improved operational procedures to facilitate both rapid access to the wounded for medical first responders and rapid extrication to definitive care, will likely have the most mortality benefit for the few casualties with potentially survivable but severe injuries following the next civilian public mass shooting event. As such, we strongly recommend studies evaluating outcomes following implementation of broader education and training in civilian TECC point-of-wounding care as a complete treatment paradigm across the chain of survival, from the uninjured but geographically present first care provider to the initial non-medical first responders to the pre-hospital medical providers to the first receivers in the trauma center.

Despite being the first study to evaluate causes of death following CPMS events, this study has several limitations that we acknowledge. First, it is a retrospective review with all of the shortcomings inherent in this study design. Second, we lacked detailed autopsy results in
some cases, and it is possible that we erroneously categorized some cases as non-survivable, but we think that the possibility of this is slim considering that, even in the cases where we had limited data, the majority of wounds were to the head and chest, and the significant operational barriers inherent in a civilian public mass shooting severely limited rapid access to emergency health care. It is also possible that we incorrectly classified some injuries as potentially survivable, but this would only bolster our concern that current, TCCC based recommendations will not impact outcome in civilian active shooter events. Next, we acknowledge the possibility of sampling bias from the recent emphasis and operationalization of hemorrhage control strategies among first response agencies. As tourniquet and hemostatic gauze use has increased among medical first response agencies over the last five years, it is possible that these strategies were employed during the response to the later events in our database, thus allowing patients with exsanguinating extremity hemorrhage to survive. If this were so, these patients would not be included in our fatality reports, falsely lowering our incidence and distribution of potentially survivable injuries. Studying public information on the medical response to the more recent events in our database, only the 2012 shooting in Tuscon has the potential for this bias. Finally, although we attempted to review as many of the autopsy reports as possible, local laws, limited public information, and/or lack of response to FOIA requests prevented us from receiving reports from many events, thereby creating additional possibility of sampling bias. This may be compounded by the fact we limited analysis to events with 4 or greater fatalities. Although we attempted to contact as many coroners/medical examiners as possible, it took over two years to collect the information in this study. We did not feel that delaying the publication of these results in an attempt to contact the remaining coroners/examiners was justified given our findings. We strongly recommend that medical societies lobby law-makers to allow better access to and more
complete reviews of outcomes following shooting events.

CONCLUSION

We found that the overall wounding pattern and the fatal wounding pattern following civilian active shooter events differ from combat injuries. There were no deaths from exsanguinating extremity wounds. As such, we discourage the current myopic focus on hemorrhage control for civilians. Instead, we urge that the tenets of civilian-based TECC be implemented across the entire pre-hospital trauma spectrum, and we further recommend studying this strategy to affirm its benefit.
Author Contribution

Reed Smith: study design, data analysis, literature search, drafting manuscript

Babak Sarani: data analysis, drafting manuscript

Geoff Shapiro: literature search, data analysis, drafting manuscript

Acknowledgement

Special thank you to Ms. Elana Pinkasovic for research assistance in completing this study.
References


11. National Association of EMTs and the American College of Surgeons Committee on Trauma. Prehospital Trauma Life Support. 8 ed: Jones and Bartlett Learning; 2013.


Figure 1: Site of Fatal Injury in Combat Personnel

- Head: 38%
- Chest: 24%
- Abdomen: 9%
- Extremity: 3%
- Face: 3%
- Neck: 6%
- Multiple: 17%
Figure 2: Selection of Civilian Public Mass Shootings for inclusion
Figure 3

Figure 3: Distribution of all wounds by anatomic location (n=297)

- Head, 29%
- Chest/Upper Back, 29%
- Abdomen/Lower Back, 14%
- Face/Neck, 9%
- Extremity, 20%

56% of victims (78/139) had wounds in multiple anatomic regions.
Figure 4: Distribution of Fatal Wounds by Anatomic Location (n=115)

- Head, 39%
- Chest/Upper Back, 38%
- Abdomen, 7%
- Multiple Regions, 10%
- Face/Neck, 6%
Table 1: Active Shooter Events Included

<table>
<thead>
<tr>
<th>Location</th>
<th>Year</th>
<th>Number of Persons Killed/Wounded</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Ysidro McDonalds, San Diego, CA</td>
<td>1984</td>
<td>19/21</td>
</tr>
<tr>
<td>Edmond Post Office, Edmond, OK</td>
<td>1986</td>
<td>15/6</td>
</tr>
<tr>
<td>Columbine High School, CO</td>
<td>1999</td>
<td>13/21</td>
</tr>
<tr>
<td>Living Church of God, Brookfield, WI</td>
<td>2005</td>
<td>7/4</td>
</tr>
<tr>
<td>Post Office, Goleta, CA</td>
<td>2006</td>
<td>6/0</td>
</tr>
<tr>
<td>Trolley Square Mall, Omaha, NE</td>
<td>2007</td>
<td>5/4</td>
</tr>
<tr>
<td>Virginia Tech University, Blacksburg, VA</td>
<td>2007</td>
<td>32/17</td>
</tr>
<tr>
<td>Northern Illinois University</td>
<td>2008</td>
<td>5/21</td>
</tr>
<tr>
<td>Safeway Parking Lot, Tuscon, AZ</td>
<td>2011</td>
<td>5/13</td>
</tr>
<tr>
<td>Sikh Temple, Oak Creek, WI</td>
<td>2012</td>
<td>7/4</td>
</tr>
<tr>
<td>Century 16 Theater, Aurora, CO</td>
<td>2012</td>
<td>12/58</td>
</tr>
<tr>
<td>Washington Navy Yard, DC</td>
<td>2013</td>
<td>13/7</td>
</tr>
</tbody>
</table>
Table 2: Wounding pattern in patients deemed to have had potentially survivable injuries

<table>
<thead>
<tr>
<th>Anatomic region</th>
<th>Number of wounds</th>
<th>Weapon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face/Neck/Chest</td>
<td>2</td>
<td>Shotgun</td>
</tr>
<tr>
<td>Neck/Chest</td>
<td>3</td>
<td>Shotgun</td>
</tr>
<tr>
<td>Face/Neck/Chest</td>
<td>2</td>
<td>Shotgun</td>
</tr>
<tr>
<td>Chest/Upper back</td>
<td>2</td>
<td>Handgun</td>
</tr>
<tr>
<td>Face/Chest</td>
<td>5</td>
<td>Shotgun</td>
</tr>
<tr>
<td>Chest/Back/Abd</td>
<td>5</td>
<td>Handgun</td>
</tr>
<tr>
<td>Chest</td>
<td>3</td>
<td>Handgun</td>
</tr>
<tr>
<td>Chest</td>
<td>1</td>
<td>Handgun</td>
</tr>
<tr>
<td>Face</td>
<td>1</td>
<td>Handgun</td>
</tr>
</tbody>
</table>