A Simplified Mass Casualty Incident Training for Medical Students

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Abstract

Background: Medical students have the ability to play an important role in institutional response to a mass casualty incident (MCI). However, while previous studies have shown a strong desire among students to take part in MCI response, a lack of training has left them unprepared to confidently respond to such an event. Currently, simpler models are needed to increase the prevalence of MCI response training in medical school curricula. Our goal was to develop a sustainable curriculum to prepare medical students to respond in MCIs by combining didactic instruction and interactive simulation-based training.

Methods: In 2017, a group of first-through-fourth year medical students designed and carried out a one-day MCI curriculum involving a one-hour didactic lecture on emergency management and triage as well as one hour of scenario-based exercises involving two mock mass casualty incidents. In order to analyze the impact of this event, students were asked to fill out pre- and post-training surveys.

Results: Out of 45 participating medical students from all levels of training, 37 filled out the pre- and post-event surveys. Prior to the event, 17% (n=35) of the attendees reported that they were aware of the University of Michigan's Mass Casualty Incident Protocol (MCIP), and 51% (n=35) reported they would be 'likely' or 'very likely' to respond to an MCI. After the event, 74% (n=35) of the students reported awareness of the MCIP, while 74% (n=35) also stated they would be likely or very likely to respond to an MCI. Of these participants, 85% (n=34) 'agreed' or 'strongly agreed' that the simulation environment was conducive to learning, and 91% (n=35) similarly agreed or strongly agreed that the simulations improved understanding of the MCIP and triage principles presented during the lecture-portion of the training.

Conclusion: Combined didactic- and scenario-based training is a simple tool to promote medical student preparedness for an MCI. In order to train a group of self-selected medical students to be involved in MCI response, future efforts to refine this training model should focus on the promotion of interprofessional involvement.

Keywords: MASS CASUALTY INCIDENT RESPONSE, MEDICAL STUDENT, TRIAGE, TRAINING, SIMULATION, CURRICULUM

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Introduction

With the recent national focus on mass casualty events including mass shootings and natural disasters, one key resource in the health care system's disaster response strategy has remained untapped: medical students. With medical education backgrounds ranging from basic to advanced, these individuals tend to have critical knowledge of the hospital systems in which they train. Additionally, they tend to live close to their local health care system, and many utilize means other than motorized vehicles for transportation, allowing them to arrive on scene quickly independently of transportation infrastructure. As a medically

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knowledgeable and dependable population, medical students have the potential to fill an important role in hospital response to mass casualty incidents (MCIs).

In order to improve medical students' ability to respond in an MCI, recommendations have been made to increase their exposure to disaster medicine. In 2003, the American Association of Medical Colleges (AAMC) published content guidelines and teaching methods to train students in bioterrorism preparedness and response (1). They recommended integration of MCI-related topics in both basic science and clinical curricula. In addition, the AAMC identified a need for specific skills training to equip medical students to function effectively in multi-disciplinary teams responding to MCIs. In order to meet this need, disaster simulation training has emerged as an effective mechanism for medical students to develop the collaboration, negotiation, and communication skills necessary to serve this role.

Disaster simulation training has previously been successfully implemented in large class settings, both with and without didactic instruction (2-4). Examples of simulation exercises that have been developed include initial management of MCIs, including explosion- and war-related, radiological/nuclear, chemical, and biological incidents. Additionally, evacuation exercises, mass casualty triage, decontamination procedures, and mannequin resuscitation have also played prominent roles in prior trainings (5). Recent efforts have shown that disaster preparedness training in an interprofessional setting involving physicians, medical students, nurses, and allied health professionals can improve provider confidence when approaching an MCI (6). All of these models have demonstrated that medical students are interested in and can learn from scenario-based trainings.

Despite the AAMC's recommendations, studies have indicated a gap in medical student training in disaster response despite high student interest (7). Unfamiliarity with the triage process, incomplete understanding of situational hazards, and inability to manage emotional responses in a disaster situation have been noted to negatively impact medical students' ability to respond to MCIs (8). Furthermore, a survey conducted in 2010 showed that few US medical schools have incorporated disaster medicine topics, such as principles of triage, ethical considerations in disaster response, or disaster epidemiology into their core curricula (9). The same study found that even fewer schools have included competency-based instruction for medical students in their disaster medicine curricula. This lack of training may significantly impair student ability to respond to an MCI and implement actions according to the incident command system.

In response to this paucity, we aimed to develop a sustainable curriculum to prepare medical students to respond in MCIs by employing didactic instruction and interactive simulation-based training. Through participant self-assessment, we aimed to answer the following questions: does simulation-based training improve understanding of the triage system, and does simulation-based training increase medical student likelihood to respond to an MCI? The design of our training and the subsequent study was intended to answer these questions. As many medical schools continue to emphasize competency-based and interdisciplinary training, the results of our study will help to inform them about meaningful methods that can be used to incorporate disaster preparedness education into the medical student curriculum.

Methods

We created a collaborative of first-through-fourth year students to plan and execute a one-day MCI curriculum. This event took the form of a one-hour didactic lecture on emergency management and triage given by two faculty members followed by a one-hour hands-on exercise in which teams of students responded to two different mock MCI simulations. In the

didactic portion, students were instructed in the Simple Triage and Rapid Treatment (START) system, developed for use by rescuers of all levels of medical training (10, Appendix 1). The didactic instruction was led by the director of the hospital burn center and an emergency medicine physician who actively researches disaster response. Students were also given a brief overview of the University of Michigan's Incident Management System for mass casualty incident response. These protocols delineated preparations for the arrival of patients in-hospital following an MCI.

In the hands-on portion of the training, 7-person groups formed with equal distributions of medical students from all years were guided through two MCI scenarios. Using a total of 14 manufactured patient descriptions, two groups worked together for both exercises. During each scenario, one group acted as patients while the other acted as health care providers responsible for triaging patients. These two groups switched roles with each scenario. Both patients and providers were given a 5-minute orientation to their scenario, and patients were provided with printed histories for the roles they were to portray (Table 1, Appendices 2, 3, and 4). Meanwhile, responders were given a general summary of one of the following MCI events: a mock bombing at a sports stadium, or a mock mass shooting at a workplace. After 30 minutes dedicated to the first scenario, roles were switched for the final 30 minutes to run the second scenario. To proctor these events, student facilitators comprised primarily of fourth year medical students were trained to relay information such as individual patient vital signs and physical exam results to responders. Student facilitators also provided real-time feedback to rescuers to reinforce concepts of the START triage system. Two to three facilitators were assigned to each pair of groups.

Students completed pre- and post-training surveys using Likert Scales on their likelihood to respond in an MCI, their perceived importance of disaster management training in medical school education, and the efficacy of the training (Appendix 5). Confidence intervals

Table 1: Brief Description of Patient Scenarios

Scenario	START Triage Code			
	Green	**Yellow**	**Red**	**Black**
Bombing at a sports stadium	1) Thrown back by blast, superficial abrasions. Very anxious. 2) Minor scrapes, doing well	1) Blast Injury (shock waves), confusion, loss of hearing	1) Crush injury, open femur fracture, unconscious 2) Tachycardia, tachypneic, soot around mouth *3) Small shrapnel entry wound, liver laceration	1) Killed in blast, not responding or breathing 2) Huge gaping abdominal wound, intestines out, still responding and screaming
Mass shooting in an office building	1) Anxious, tachycardic, no obvious injuries or wounds 2) Injured during chaos after shooting, painful arm, neurovascularly intact 3) Gunshot wound to the buttock	1) Jumped out window, fracture of feet and spine, paresis	1) Shot in abdomen, active hematemesis. Patient in shock, severity of injury unclear from initial patient presentation. 2) Shot to lateral chest wall, single bullet wound, absent breath sounds on right side, tachycardia, shortness of breath, hypotension	1) Shot in midline abdomen, exsanguinated, no pulses, no breathing with head thrust *2) Gunshot wound to forehead

* Indicates scenario was not used based on participant numbers

were calculated using McNemar's test. As part of these surveys, participant demographics were collected. University of Michigan Medical School class sizes were obtained from publicly-available entering class profiles from 2012 to 2017, while other school-wide figures were calculated as follows: all first-through-fourth year medical students complete Basic Life Support training; eight students rotate in Acute Care Surgery during each of six surgery clerkships per year (completed by 40 third-year and 48 fourth-year students by mid-October October 2017); all fourth-year medical students complete a 4-week emergency medicine clerkship: approximately 5/12 of the fourth year medical students had completed this clerkship by mid-October 2017.

Results

Forty-five medical students attended the event, with 37 providing feedback in the form of pre- and post-training surveys (82% response rate; Table 2). Participants varied in their level of exposure to medical practice in acute care situations. 37% (n=37) of participants were third and fourth year medical students in the clinical phase of their training, while the remaining students (MD/PhD, first-, and second-year) had limited previous clinical exposure. Of all the students in attendance, 100% (n=37) had completed Basic Life Support Training, including CPR and AED certification. Additionally, 21% (n=37) of the students had completed clerkships in emergency medicine, while 10% (n=37) had previously completed the acute care surgery rotation (Table 2).

Prior to completing the didactic or simulation portions of the event, participants completed a pre-training survey inquiring about prior awareness of the Hospital-wide Mass Casualty Incident Protocol (MCIP) and their likelihood of responding to an MCI. Out of 35 students who answered these questions, 17% (n=35) reported that they were aware of the MCIP. 51% (n=35) of the students reported that they would be 'likely' (L) or 'very likely' (VL) to respond to an MCI, while 34% (n=35) responded that they were 'not likely' (NL) or 'not likely at all' (NLAL) to respond (Figure 1). Answers to these and other questions were asked upon completion of the event.

Following the training, there was a 334% relative increase in participant awareness of the MCIP, increasing from 17 to 74% (n=35). Additionally, there was an increase of 44% in the number of participants reporting they would be L or VL to respond in the event of an MCI, up from 51 to 74% (n=35). Additionally, there was a decrease of 91% in the number of students reporting that they would be NL or NLAL to respond, from 34 to 2.9% (n=35; Figure 1). Overall, 54% of the participants reported an increased likelihood of responding to an MCI after the training as compared to prior with an estimated rate of backsliding of 0 (95% confidence level 37%-71%; p=0.004 by the Cochrane-Armitage Trend Test).

Following the event, questions in the post-survey allowed participants to assess the

Table 2: Participant and Medical School Demographics

		Participants (n=37)	University of Michigan Medical School (n=715)
Year in Medical School	First Year	29.7% (11)	24.8% (177)
	Second Year	29.7% (11)	24.1% (172)
	Research-Years MD/PhD	2.7% (1)	6.4% (46)
	Third Year	2.7% (1)	22.5% (161)
	Fourth Year	35.1% (13)	22.2% (159)
Completed Basic Life Support (BLS) Training		100% (37)	100% (715)[+]
Completed Emergency Medicine Clerkship		21.6% (6)	9.2% (66)[+]
Completed Acute Care Surgery Rotation		10.8% (4)	12.3% (88)[+]

*45 participants took part in this event, of which 37 filled out demographic information in the pre-training survey.
[+]These medical school figures have been calculated using methods described in the Methods section.

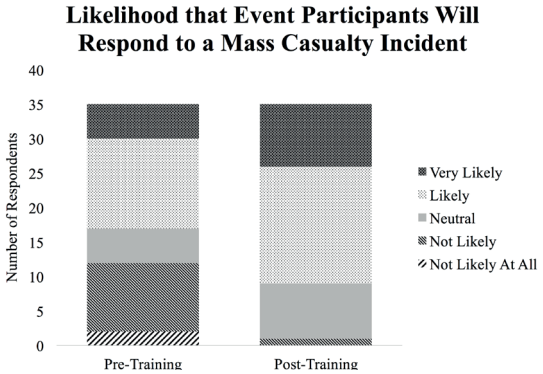

Figure 1: Participant Likelihood to Respond to a Mass Casualty Incident, Before and After Training. Prior to the start of the training, 51% of the respondents stated that they would be 'likely' or 'very likely' to respond in the event of a mass casualty incident. Following the training, this number increased to 74% (n=35). Over this same period, the number of participants stating they would be 'not likely' or 'not likely at all' to respond decreased from 34 to 2.9% (n=35).

quality and necessity of the training they had received. 85% (n=34) of participants selected 'agree' or 'strongly agree' when asked whether the simulation environment was conducive to learning, while 91% (n=35) agreed or strongly agreed that the simulations improved their understanding of the material presented during the didactic portion of the training (Figure 2). Finally, 97% (n=35) of the participants agreed or strongly agreed that the inclusion of disaster management training in the medical school curriculum is important. Written comments received at the conclusion of the training included suggestions to reduce the number of student facilitators to one per group, increase the amount of time spent teaching practical first aid, and extend the event to last a full day.

Discussion

Over the last 10 to 15 years, there has been a growing realization that medical students have the desire and ability to assist in the event of MCIs. However, up to this point, there have been few resources available to provide medical schools with simple resources that will allow them to effectively train their students. Despite recommendations by the

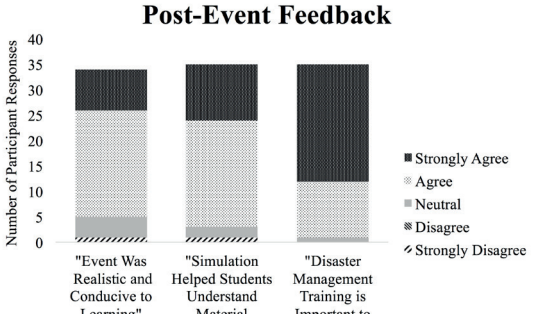

Figure 2: Post-Training Participant Feedback. Feedback received after the training indicated that 85% (n=34) of participants 'agree' or 'strongly agree' that the simulation was conducive to learning. 91% (n=35) agree or strongly agree that the simulations improve their understanding of material presented in the didactic session, and 97% (n=35) agree or strongly agree that it is important to include disaster management training in the medical school curriculum.

AAMC to promote medical student skill development in triage, a gap between need and execution still remains. To meet this need, we developed a model that can be easily employed to teach medical students about triage and MCI response. Utilizing a didactic lecture on the START triage system and fourteen patient scenarios involving a mock bombing or a mock mass shooting, medical educators at other institutions will be able to use and learn from our template to teach their own students. When proctored by clinical students familiar with these cases, these simulations enhanced participants' understanding of the triage principles and resulted in a statistically significant increase in medical student likelihood to respond to an MCI. Students found this training to be realistic and conducive to their learning, filling an important gap in their medical school education.

This training serves as a concise and practical introduction to triage and disaster response skills. Unlike other MCI curricula, our model did not include training in ethical issues impacting disaster preparedness, disaster-specific physical examination skills and first aid, or evacuation and decontamination procedures (4, 5). Instead, we focused on the importance of appropriate triage in an

MCI scenario. Given that the majority of our participants were in the clinical phase of their medical education (2nd through 4th year students), we elected not to incorporate basic science concepts relating to various chemical and biological agents as has been done in other trainings (3).

Our training model serves as an important step towards developing an easy-to-implement disaster management curriculum. However, this model does have shortcomings that should be addressed in further iterations of the training. It is possible that self-selection may have inflated the degree to which participants value MCI training in the medical school curriculum. Additionally, in choosing to attend this type of training, students may have already considered their response to an MCI. It is therefore possible that the same training model utilized with a population of average medical students would not produce such a marked increase in likelihood to respond to an MCI. The training curriculum itself may also be improved in response to comments received in the post-surveys. For example, although it would increase the complexity of the training, it may be beneficial to pair this event with a session focused on practical first aid, particularly for pre-clinical students who have not yet been exposed to acute care settings. Finally, as the AAMC notes, interdisciplinary work during MCI response is critical to success, and it is possible that modules could be added into this model to allow for inclusion of students from other professional programs (6).

In order to convince hospital administrators that medical students as a whole can serve in a larger role during an MCI, it will likely be necessary to carry out a larger quantitative study to validate the effectiveness of this training. Alternately, based on the self-selection exhibited by students choosing to attend this event, it is likely that medical administrators could find smaller groups of medical students at their institution interested in and capable of responding to an MCI. These students could form an important resource for future hospital disaster and MCI response. Further work should focus on incorporating medical students into hospital-level disaster protocols, and the impact of further iterations of this and similar trainings on student confidence during MCI simulations should be assessed.

Conclusion

Utilizing a combination of didactic and scenario-based simulations, our training model produced an increase in the overall likelihood that medical students from all levels of training would respond to an MCI. This result was accompanied by a significant increase in participant awareness of the University of Michigan's Incident Management Program. Students found the simulation environment to be conducive to learning, improving their knowledge of a topic they feel is important to their medical education. These results suggest that implementation of similar MCI trainings could fill what the AAMC considers a vital gap in the medical school curriculum. In doing so, schools would enable a new resource that could be utilized in the event of an MCI: a group of trained and dependable medical students. While the potential for expansion and further refinement remains, this model serves as a simple method for medical schools to integrate MCI training into their curricula.

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Conflict of Interest

The author declares no conflict of interest.

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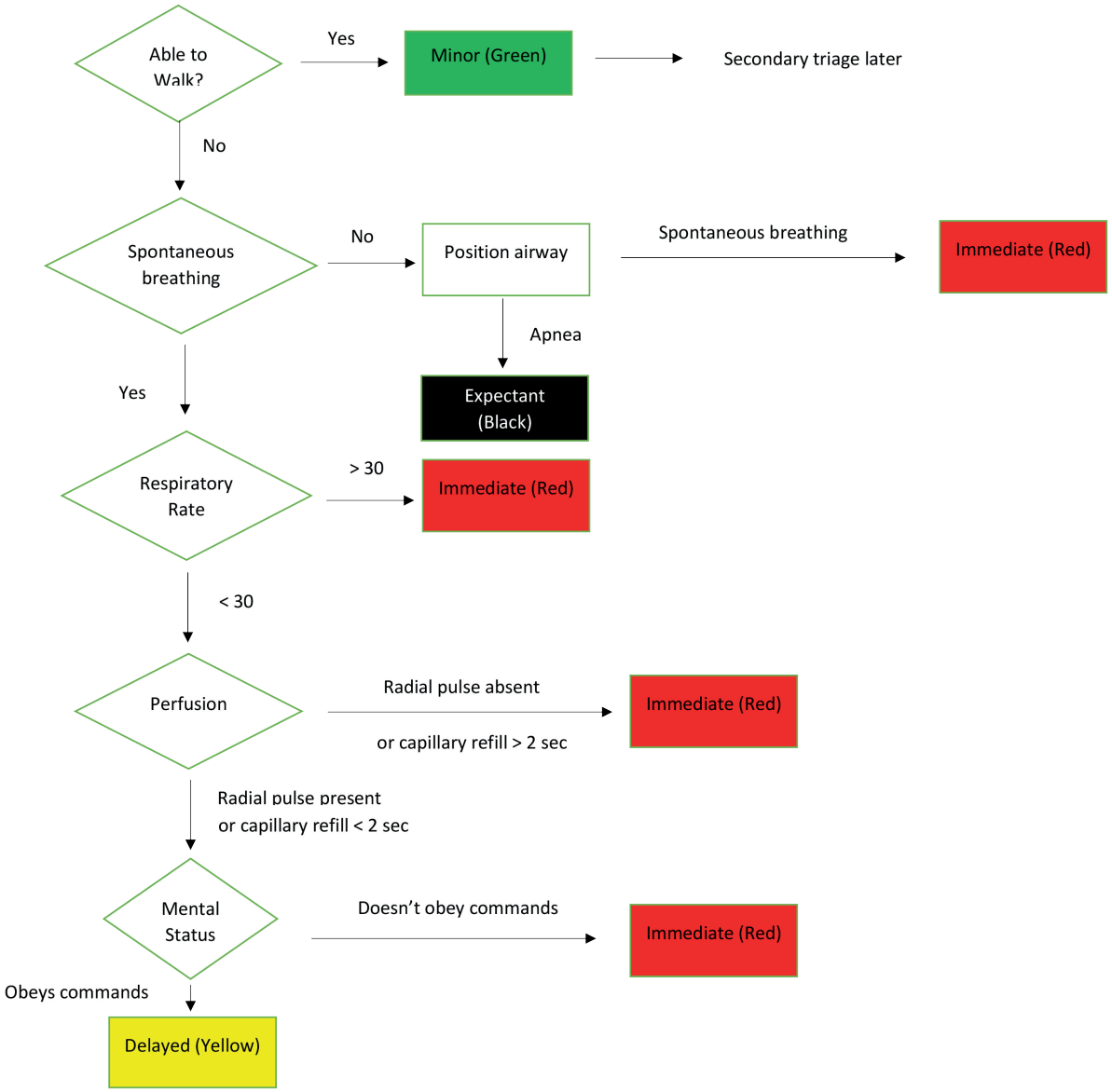
Appendix 1



Appendix 2: Bombing Simulation

Patient 1	20 yo
Patient description	Patient has evidence of diffuse secondary blast injury with small objects (e.g. glass, other debris) in the skin, and tertiary blast injury with diffuse abrasions from being thrown backwards by the blast wave – the patient has normal mentation, is very anxious and vocal, with otherwise unremarkable primary survey.
Catalog of injuries (COI)	Diffuse Abrasions
Triage status (initial and revised, if needed)	Green
Critical actions	Brief exam, history, determine that patient is stable with no immediate resuscitation needs. Team does not spend unnecessary time or resources with this patient even though the patient insists on their attention.
Diagnosis	Anxiety/Panic Attack

Final Management	No need for intervention. Will not help with other victims, keeps demanding help. No need to go to hospital.
Supply inventory	None
Actor instructions (includes pertinent background, acting instructions and intended triage status)	This person should be asking for help and be much more vocal than the other victims. Saying your body hurts and it is hard to breath. Goal is to distract responders from helping more critical patients. Be unwilling to help with care of other victims when responders ask for your help because you think you deserve attention yourself. · After frequent reassurance is given and the team has completed the above critical actions this patient becomes less vocal, but still stays on the scene asking for help.
Information for Facilitator (short background, vitals, pertinent exam)	Vitals: T 37.0 RR 25 HR 93 BP 140/80 O2sat 97% on RA · Gen: Anxious, vocal patient, asking for attention. · HEENT: Atraumatic, pupils equal round reactive bilaterally, oropharynx benign, moist mucus membranes · Neck: Supple, no lymphadenopathy. · Lungs: Increased rate of breathing. CTAB. No wheezes. · Heart: Regular rate, regular rhythm. No murmurs. · Abdomen: Soft, no tenderness, no rebound or guarding. · Neuro: GCS 15 · **Skin: Skin has diffuse superficial abrasions with glass particles and other debris evident.**

Patient 2	44 yo
Patient description	At the game with his/her friend (Patient 3). The blast occurred on the other side of the stadium. He/she was knocked down, receiving minor superficial abrasions involving minor bleeding and glass particles/other debris. She/he is looking after her friend.
Catalog of injuries (COI)	Minor scrapes
Triage status (initial and revised, if needed)	Green
Critical actions	Brief history and physical exam, determine that patient has no immediate resuscitation needs. Cover abrasions when able to. Encourage patient to help with other patients by applying pressure to other patients' bleeding wounds (note: they have no medical training).
Diagnosis	Skin has scattered superficial abrasions with minor bleeding and glass particles and other debris evident.
Final Management	Patient can assist rescuers.
Supply inventory	Gauze
Actor instructions (includes pertinent background, acting instructions and intended triage status)	Patient is calm and cooperative with minor injuries. Patient wants to look after her/his friend, but after reassurance that the friend is alright she/he is willing to help rescuers with resuscitation efforts. Patient has no medical training.

Information for Facilitator (short background, vitals, pertinent exam)	Vitals: T 37.0 RR 18 HR 70 BP 100/65 O2sat 97% on RA Gen: Calm, alert and oriented x4 HEENT: Atraumatic, pupils equal round reactive bilaterally, oropharynx benign, moist mucus membranes Neck: Supple, no lymphadenopathy. Lungs: Normal work of breathing. CTAB. No wheezes. Heart: Regular rate, regular rhythm. No murmurs. Abdomen: Soft, no tenderness, no rebound or guarding. Neuro: GCS 15

Patient 3	48 yo
Patient description	Patient in late 40s, shaking their head and rubbing at their ears. Patient was close to the blast when it occurred and has evidence of primary shockwave injury. They complain of a sense of "cotton" in their ears, difficulty breathing, and muscle pain over his right chest. He does not appear to understand where he is or what has happened to him. Doesn't follow verbal instructions due to hearing loss, but complies with simple hand signal instructions.
Catalog of injuries (COI)	Blast Injury (shock waves) causing confusion, loss of hearing, and pulmonary contusion
Triage status (initial and revised, if needed)	Yellow/green
Critical actions	- Brief history and exam. Team recognizes patient has lost hearing and communicates with patient with gestures. - Team recognizes that priority is Delayed and they can move on to other patients.
Diagnosis	Altered mental status, hearing loss, pulmonary contusion
Final Management	Patient becomes peripheral to simulation. Doesn't need evacuation to hospital, but should go on own to evaluate hearing loss.
Supply inventory	Nothing needed.
Actor instructions (includes pertinent background, acting instructions and intended triage status)	You have suffered a primary shockwave injury and are confused about where you are and what has happened. You don't respond to verbal instructions due to not hearing them. You yell when you talk due to hearing loss. Both ears have ringing sound and feel fuzzy. Breathing is difficult and your chest is hurts, especially as it is examined. You are cooperative and respond to non-verbal communication.
Information for Facilitator (short background, vitals, pertinent exam)	PE: --Vitals: RR 24 HR 110 BP 164/90 --Gen: Awake and staring, can follow simple non-verbal commands --HEENT: Bilateral hearing loss on light finger rub, pupils equal round reactive bilaterally,, oropharynx benign, moist mucus membranes --Neck: Supple, no lymphadenopathy. --Lungs: Chest wall tenderness on palpation. Dyspnea. CTAB. --Heart: Regular rate, regular rhythm. No murmurs. --Abdomen: Soft, no tenderness, no rebound or guarding. --Neuro: GCS 14 (Opens eyes spontaneously, Confused/disoriented, Obeys motor commands) PMH: HTN diagnosed at age 35, well-controlled on HCTZ (25 mg qd)

Patient 4	22 yo
Patient description	Was 5m from blast, but shielded by concrete wall from direct explosion. Has a large block of concrete fall from the stadium (due to the explosion) on to his right lower leg
Catalog of injuries (COI)	Patient is wearing shorts and has an open fracture of their right proximal tibia and fibula. The block is still on their leg and patient is initially unconscious from the pain of the injury but still breathing. There is a small pool of blood around his right leg and is bleeding from the wound. They are not bleeding from anywhere else and has minor scrapes on face and hands. No significant past medical history, takes no meds, no allergies.
Triage status (initial and revised, if needed)	Red (life threatening injuries)
Critical actions	Need to move the concrete block. Assume 200 lbs, so need at least two responders initially. Need to stabilize the right leg and stop the bleeding (may require tourniquet, facilitator will communicate with team regarding rate of bleeding). Patient can still bear weight on his left leg, so can be evacuated from the scene with one or two person assist to an ambulance/car to take to nearest hospital.
Diagnosis	Open fracture with continued slow bleed
Final Management	2 large bore IVs, NS bolus on way to hospital. Emergent transport to stop bleed and stabilize leg.
Supply inventory	Tourniquet, leg splint, IV kit
Actor instructions (includes pertinent background, acting instructions and intended triage status)	- Arousable to loud voice, but cries out in pain as soon as aroused. - Cooperative, but in extreme pain. Not able to move without assistance. Will need two person assist/carry to ambulance. You are able to answer simple questions, but if bleeding is not controlled, you become lightheaded and lose consciousness.
Information for Facilitator (short background, vitals, pertinent exam)	**Pertinent exam:** Vitals: T 37.0 RR 12 HR 130 BP 100/60 O2sat 97% on RA Gen: Arousable to loud voice, but cries out in pain as soon as aroused. HEENT: Atraumatic, pupils equal round reactive bilaterally, oropharynx benign, moist mucus membranes Neck: Supple, no lymphadenopathy. Lungs: Normal work of breathing. CTAB. No wheezes. Heart: Regular rate, regular rhythm, tachycardic. No murmurs. Abdomen: Soft, no tenderness, no rebound or guarding. Neuro: GCS 15 **Ext: open fracture of his right proximal tibia and fibula, small pool of blood around right leg with continual blood loss.**

Patient 5	57 yo
Patient description	Was approximately 20m from blast. Thrown backward by blast, did not hit head. No LOC. Complains of vague right upper quadrant abdominal pain. Eventually decompensates due to liver laceration.
Catalog of injuries (COI)	COI: “scratch” on right upper abdomen with small amount of blood
Triage status (initial and revised, if needed)	Initial: **Green (minor injuries)**, Revised**: Red (life-threatening injuries)**
Critical actions	Initial assessment, clear patient to continue assisting with evacuation efforts

Diagnosis	Liver laceration secondary to shrapnel, evolving into hemorrhagic shock
Final Management	2 large bore IVs, NS bolus on way to hospital. Emergent transport to trauma center for ex lap.
Supply inventory	IV kit, BP cuff, 4x4, gauze tape.
Actor instructions (pertinent background, acting instructions, intended triage status)	- **Background:** Was approximately 20m from blast. Fell backward, did not hit head or lose consciousness. Complains of vague right upper quadrant abdominal pain, "scratch" on his abdomen with small amount of blood. - **Instructions:** You are able to walk from site when told to and have been assisting with evacuation efforts. Sometime later, you become fatigued and your pain has worsened. During repeat exam, *you become* disoriented and anxious - **Intended Triage Status:** Initially Green (minor injuries), then Red (Life-threatening injuries)
Information for Facilitator (short background, vitals, pertinent exam)	- Initial physical exam o VS: HR 72 bpm, RR 16, BP 130/80 mmHg, T 38C. o HEENT: NCAT, PERRL. o Extremities: Warm and well-perfused. Small bruises on right elbow and buttock. o Abdomen: non-distended, slight TTP near epigastrium and RUQ, small ~1cm wound in RUQ, oozing small amount of blood, no foreign body visible o Neuro: GCS 15 - Repeat physical exam o Repeat VS: HR 112, RR 24, BP 90/40, T 37C o HEENT: NCAT, PERRL. o Extremities: **Cap refill 5 sec**. Bruises on right elbow and buttock unchanged. o Abdomen: distended abdomen, diffuse TTP with rebound tenderness, RUQ wound unchanged, no foreign body visible o *During exam, becomes* disoriented and anxious, GCS 14 (- 1 pt Verbal: Confused)

Patient 6	20 yo
Patient description	This patient is suffering from a burn injury due to the blast. Patient has soot located around mouth – the patient has decreased mentation, is slightly anxious, and moderately vocal with some difficulty speaking.
Catalog of injuries (COI)	Some third degree burns of skin. Inhalation injury.
Triage status (initial and revised, if needed)	RED
Critical actions	Patient requires immediate airway evaluation with intubation or bag mask ventilation to protect airway.
Diagnosis	Inhalation injury.
Final Management	Need to get to hospital for respiratory support.
Supply inventory	Bag mask. Pulse ox.

Actor instructions (includes pertinent background, acting instructions and intended triage status)	This person is confused and altered. Patient is slightly anxious, coughing, and has some difficulty speaking. You become more obtunded and have increasing dyspnea prompting team to intubate/bag mask. Once team has made decision to intubate - facilitator uncovers adjacent Sim Man manikin and the remainder of the simulation can take place with the mannequin.
Information for Facilitator (short background, vitals, pertinent exam)	Vitals: T 37.0 RR 30 **HR 110** BP 140/80 **O2 sat 89**% on RA Gen: Anxious, vocal patient, asking for attention. HEENT: Atraumatic, pupils equal round reactive bilaterally, reactive. Soot on face and in posterior oropharynx, singed nares. Neck: Supple, no lymphadenopathy. Lungs: Tachypneic, diffuse wheezes. Heart: Regular rate, regular rhythm, tachycardic. No murmurs. • Abdomen: Soft, no tenderness, no rebound or guarding. • Neuro: GCS 11 (3E, 3V, 5M) 3t (once intubated) • Skin: no evidence of trauma.

Patient 7	27 yo
Patient description	The patient was killed in the blast. They are found coated in debris, in a heap. They do not respond or breath.
Catalog of injuries (COI)	Patient is dead.
Triage status (initial and revised, if needed)	Black
Critical actions	Auscultation, head thrust, check pulse - no spontaneous respirations after head thrust. Patient is dead.
Diagnosis	Patient is dead.
Final Management	Patient lies dead through scenario
Supply inventory	Sheet
Actor instructions (includes pertinent background, acting instructions and intended triage status)	You are dead. You are found covered in debris, in a heap. You are not breathing, and you do not respond.
Information for Facilitator (short background, vitals, pertinent exam)	The patient is dead.

Patient 8 Name and Age	23 yo
Patient description	Patient is in early 20s who exhibits a huge, gaping abdominal wound and evisceration. Patient is responsive and in extreme distress, screaming dramatically. His screaming becomes less vigorous over time until it ceases during examination. PMH: No significant hx
Catalog of injuries (COI)	Abdominal wound and evisceration
Triage status (initial and revised, if needed)	Black
Critical actions	- Team performs brief exam including head thrust, moves onto other patients when no spontaneous respirations are noted on auscultation.
Diagnosis	Expired

Final Management	Patient becomes peripheral to simulation. Facilitator will confirm repositioning the airway does not yield spontaneous respirations (if we plan to include that aspect).
Supply inventory	Nothing needed / a sheet to cover him.
Actor instructions (includes pertinent background, acting instructions and intended triage status)	Screaming dramatically. Screaming becomes less vigorous over time until it ceases during examination and patient becomes limp. Unresponsive afterwards.
Information for Facilitator (short background, vitals, pertinent exam)	Physical Exam: Expired during evaluation No spontaneous respirations after head thrust Abd: open abdominal wound with eviscerated bowel

Mass Shooting Simulation

Patient 9 Name and Age	35 yo
Patient description	Patient is a 35yo who was standing next to someone who was shot, so she has blood splatter on her shirt. She was then pushed over by others trying to evacuate the scene after the shooting. She banged her right knee on the cement and has scratches on her face and hands from the fall. She is otherwise fine and has no acute medical conditions. She is sitting alone on the ground where she was pushed over.
Catalog of injuries (COI)	She banged her right knee on the cement and has scratches on her face and hands from the fall. She is otherwise fine and has no acute medical conditions.
Triage status (initial and revised, if needed)	Green
Critical actions	Brief history and exam. After finding no acute injuries, she should be briefly comforted and asked to see if she is able to help with others. No immediate medical actions needed for her, but the focus will be to not be distracted by her.
Diagnosis	Anxiety/Fear
Final Management	Nothing needed. Don't let her slow help given to others
Supply inventory	Nothing needed.
Actor instructions (includes pertinent background, acting instructions and intended triage status)	This person is clearly in distress—crying, holding her knee in pain, and yelling about what she has just witnessed. She is fixated on her knee pain and the blood on her shirt, and she yells for help and asks why no one is helping her. When asked by the team to help others, she refuses to help. This person is most importantly a distraction from the more critical patients.

Information for Facilitator (short background, vitals, pertinent exam)	- **Pertinent exam:** o Vitals: BP 130/90, HR 110, RR 25 o **Gen: Moderate distress, crying, yelling for help** o HEENT: Multiple superficial abrasions on right side of face o Lungs: Tachypnic, CTAB o Heart: Tachycardic, regular rhythm o Abdomen: Soft, nontender, nondistended o Ext: Superficial laceration to right knee and abrasions on bilateral palms

Patient 10	27 yo
Patient description	Upon hearing active shooter alert over the intercom, quickly hid and barricaded herself in a storage room. Complains of left wrist pain and is crying. She does not recall any trauma to her arm, but she was so frantic during the shooting that she thinks she might have injured herself without noticing it.
Catalog of injuries (COI)	Wrist sprain
Triage status (initial and revised, if needed)	Green
Critical actions	Clear to assist evacuation efforts. (In reality, is probably too anxious to be of much help.)
Diagnosis	Wrist sprain, panic attack
Final Management	Triage staff may direct another Green to calm her down. Eventually, may send for x-ray, but only after Red and Yellow patients are stabilized.
Supply inventory	Ice, wrist splint
Actor instructions (includes pertinent background, acting instructions and intended triage status)	Upon hearing active shooter alert over the intercom, quickly hid and barricaded herself in a storage room. Holding left wrist and crying. She does not recall any trauma to her arm, but she was so frantic during the shooting that she thinks she might have injury herself without noticing it.
Information for Facilitator (short background, vitals, pertinent exam)	**Initial Evaluation**: · VS on presentation: HR 90, RR 25. · Info provided if asked: BP 120/76, T 38. · Focused physical exam: o HEENT: NCAT, PERRL. o Extremities: Warm and well-perfused. Normal ROM of left wrist, pain elicited with abduction. Pulses and light touch sensation intact throughout left forearm and hand. o Neuro: GCS 15

Patient 11 Name and Age	27 yo
Patient description	Patient laying on the ground after jumping out of a window to escape the shooter. Mentation is disordered with confusion on what happened, is slightly anxious, and moderately vocal, complaining about being unable to feel or move his legs.

Catalog of injuries (COI)	Fracture of both feet and spine. No clear superficial injuries.
Triage status (initial and revised, if needed)	Yellow
Critical actions	Need to assess neurological exam, including log roll and palpation of vertebral column. Secure C-spine.
Diagnosis	Low thoracic/high lumbar spinal injury. Fracture of feet.
Final Management	Don't move the patient to evacuation area until on back board or something to stabilize spine. Will need to go to hospital eventually, but can wait.
Supply inventory	C-collar.
Actor instructions (includes pertinent background, acting instructions and intended triage status)	This person should be asking for help. Person should avoid moving or using his legs in any way. He is still able to move his upper body and complains of general body aches. Complains of feeling numb in both legs and sensation below umbilicus is reduced on exam.
Information for Facilitator (short background, vitals, pertinent exam)	o Vitals: T 37, RR 22, HR 105, BP 130/80, SpO2 99% RA o Gen: Slightly anxious, asking for attention o HEENT: Atraumatic, pupils equal round reactive bilaterally, oropharynx benign, moist mucus membranes o Neck: Supple, no lymphadenopathy o Lungs: Normal work of breathing, CTAB, no wheezes o Heart: Regular rate, regular rhythm, no murmurs o Abdomen: Soft, no tenderness, no rebound or guarding o **Neuro: GCS 13 (eyes open spontaneously, confused speech, localizes pain), 0/5 strength in lower extremities. Reduced sensation below umbilicus. No movement to noxious stimuli in lower limbs. Hyperreflexia in LE.** o Skin: No evidence of trauma

Patient 12 Name and Age	24 yo
Patient description	The patient was shot in the right butt cheek while fleeing the scene of the shooting.
Catalog of injuries (COI)	Shot in right butt cheek
Triage status (initial and revised, if needed)	Yellow
Critical actions	Actions/Results: Take BP, HR, RR, physical exam, give morphine - patch with gauze, can help calm/talk to other patients, but cannot move
Diagnosis	GSW to right butt cheek
Final Management	Maintain in comfortable position until transport is possible (low priority)
Supply inventory	Gauze
Actor instructions (includes pertinent background, acting instructions and intended triage status)	You were fleeing the scene and were shot in the right butt cheek. You have a ¼" entry wound, but no exit wound. You have some minor bleeding. It is painful to lay supine, sit, or stand without assistance. You are found lying stomach down, A+Ox4.

Information for Facilitator (short background, vitals, pertinent exam)	PMH: peanut allergy (no epipen, last attack 10 years ago), recently received rabies series for dog bite Actions/Results: Take BP, HR, RR, physical exam, give morphine - patch with gauze, can help calm/talk to other patients, but cannot move

Patient 13	30 yo
Patient description	Patient is a 30 yo who sustained a direct, close-range shot to the abdomen (LUQ). She is curled in a fetal position on the ground. The wound is bloody, swollen, and bruised. She is conscious but pale, anxious, diaphoretic, and vomiting frank blood. Additionally, she complains of pain in her left shoulder.
Catalog of injuries (COI)	GSW to abdomen, active hematemesis
Triage status (initial and revised, if needed)	Red
Critical actions	- Brief history and exam - Team should recognize this patient is Immediate priority and concentrate their efforts here. - Secure airway - Intubate - IV fluids - Transport to hospital - (Once intubation is deemed appropriate, team should switch to mannequin.)
Diagnosis	GSW to LUQ, hit spleen
Final Management	Transport to hospital
Supply inventory	Intubation kit, IV kit, oxygen
Actor instructions (includes pertinent background, acting instructions and intended triage status)	This person is ill-appearing and less communicative. She is curled in a fetal position on the ground and vomiting frank blood. She complains of pain in her left shoulder.
Information for Facilitator (short background, vitals, pertinent exam)	PE: --Vitals: RR 34 HR 138 BP 81/60 **--Gen: On ground in great discomfort, curled to guard abdomen. Pale, profusely diaphoretic.** **--HEENT: Cyanosis, pupils equal round and reactive, dry mucus membranes.** --Neck: Supple, no lymphadenopathy. **--Lungs: Shallow breathing. Moderate increase in work of breathing. CTAB. No wheezes.** **--Heart: Tachycardic, regular rhythm. No murmurs.** **--Abdomen: TTP in LUQ, positive Kehr's sign, guarding.** --Neuro: GCS 15 PMH: Persistent Asthma diagnosed at age 5 well-controlled on Symbicort BID, albuterol PRN

Patient 14 Name and Age	65 yo,

Patient description	65 year old was running away from the shooter. He was shot from ~25ft away in the right upper back (below the scapula) and the bullet exited the right upper axillary area under his arm (arm was missed). He was able to stand up briefly and tried to evacuate the scene, but he had to stop after 10 yards and sit against a wall due to pain and increasing SOB. His left hand is covering his exit wound as he tries to apply pressure. The back of his shirt is saturated with blood around the entry wound. He is confused on questioning (hypoxic).
Catalog of injuries (COI)	Gunshot wound to right upper back, exit right axillary area. Developing tension pneumothorax
Triage status (initial and revised, if needed)	Red
Critical actions	· Identify that he has a sucking chest wound from the gunshot and tension pneumothorax. · Apply pressure dressings to wounds to stop air inflow. · Needle decompression in the field. · Provide oxygen support and evacuate to nearest medical facility.
Diagnosis	Tension pneumothorax and GSW
Final Management	Needle compression, stop bleeding and evacuate to hospital
Supply inventory	Large bore needle, pressure dressing, oxygen support during drive to hospital
Actor instructions (includes pertinent background, acting instructions and intended triage status)	He was able to stand up briefly and tried to evacuate the scene, but he had to stop after 10 yards and sit against a wall due to pain and increasing SOB. His left hand is covering his exit wound as he tries to apply pressure. Confused on questioning.
Information for Facilitator (short background, vitals, pertinent exam)	**Initial Evaluation**: · HR 72 bpm; RR 28; BP 90/40mmHg; O2 sat in 80s · Focused physical exam: o General: Confused, gasping for air, yelling in pain. o Extremities: Weak radial and DP pulses o Chest: Entry wound in the back is much bigger than exit wound in front. Trachea is deviated to the left. Breath sounds are absent on the right. Hyper-resonant right chest to percussion. o Neuro: GCS 13 Unable to obtain past medical history. No medications, no known allergies.

Patient 15	Unknown, middle-aged woman
Patient description	No demographic or past medical information Was found by SWAT crew ten minutes after mass shooting in a puddle of blood.
Catalog of injuries (COI)	GSW to left forehead
Triage status (initial and revised, if needed)	Black
Critical actions	Initial evaluation
Diagnosis	

Final Management	Triage patient
Supply inventory	
Actor instructions (includes pertinent background, acting instructions and intended triage status)	Patient is already dead.
Information for Facilitator (short background, vitals, pertinent exam)	Initial evaluation: No spontaneous breathing or pulses detected. Focused physical exam: o HEENT: GSW to left forehead. Pupils fixed and dilated. o Neuro: Pupils fixed and dilated, GCS 3

Patient 16	30 yo
Patient description	30yo shot at close-range 2 times. Patient lying on the ground motionless with large amount of blood in mid abdomen.
Catalog of injuries (COI)	2 GSW to the abdomen. 2 exit wounds on back.
Triage status (initial and revised, if needed)	BLACK
Critical actions	· Perform head thrust to ensure absence of spontaneous respirations · Determine that patient is deceased. · Team does not spend unnecessary time or resources with this patient.
Diagnosis	Deceased
Final Management	Treat with dignity. Close patient's eyes and cover when able to.
Supply inventory	Nothing
Actor instructions (includes pertinent background, acting instructions and intended triage status)	Should provide feedback (hold card) when auscultation is performed to confirm that there are no respirations when airway is positioned and that there is no pulse when central pulses are palpated
Information for Facilitator (short background, vitals, pertinent exam)	Unable to palpate pulses; not breathing. Abdomen: 2 visible entry wounds just above the umbilicus GCS: 3

Appendix 3: ACTOR INSTRUCTIONS: BOMBING SIMULATION

Patient 1 Name and Age	20 yo
Pertinent Background	Patient has evidence of diffuse secondary blast injury with small objects (e.g. glass, other debris) in the skin, and tertiary blast injury with diffuse abrasions from being thrown backwards by the blast wave – the patient has normal mentation, is very anxious and vocal, with otherwise unremarkable primary survey.

Acting Instructions	This person should be asking for help and be much more vocal than the other victims. Saying your body hurts and it is hard to breath. Goal is to distract responders from helping more critical patients. Be unwilling to help with care of other victims when responders ask for your help because you think you deserve attention yourself. · After frequent reassurance is given and the team has completed the above critical actions this patient becomes less vocal, but still stays on the scene asking for help.
Intended Triage Status	Green

Patient 2 Name and Age	44 yo
Pertinent Background	At the game with his/her friend (Patient 3). The blast occurred on the other side of the stadium. He/she was knocked down, receiving minor superficial abrasions involving minor bleeding and glass particles/other debris. She/he is looking after her friend.
Acting Instructions	Patient is calm and cooperative with minor injuries. Patient wants to look after her/his friend, but after reassurance that the friend is alright she/he is willing to help rescuers with resuscitation efforts. Patient has no medical training.
Intended Triage Status	Green

Patient 3 Name and Age	48 yo
Pertinent Background	Patient in late 40s, shaking their head and rubbing at their ears. Patient was close to the blast when it occurred and has evidence of primary shockwave injury. They complain of a sense of "cotton" in their ears, difficulty breathing, and muscle pain over his right chest. He does not appear to understand where he is or what has happened to him. Doesn't follow verbal instructions due to hearing loss, but complies with simple hand signal instructions.
Acting Instructions	You have suffered a primary shockwave injury and are confused about where you are and what has happened. However, you follow directions as given. Your hearing is fuzzy in both ears. Breathing is difficult and your chest is hurts, especially as it is examined.
Intended Triage Status	Yellow/green

Patient 4 Name and Age	22 yo

Pertinent Background	Was 5m from blast, but shielded by concrete wall from direct explosion. Has a large block of concrete fall from the stadium (due to the explosion) on to his right lower leg. He is wearing shorts and has an open fracture of his right proximal tibia and fibula. The block is still on his leg and he is unconscious from the pain of the injury but still breathing. There is a small pool of blood around his right leg and he is bleeding from the wound. He is not bleeding from anywhere else and has minor scrapes on his face and hands. No significant past medical history, takes no meds, no allergies.
Acting Instructions	- Arousable to loud voice, but cries out in pain as soon as aroused. - Cooperative, but in extreme pain. Not able to move without assistance. Will need two person assist/ carry to ambulance. You are able to answer simple questions, but if bleeding is not controlled, you become lightheaded and lose consciousness.
Intended Triage Status	Red

Patient 5 Name and Age	57 yo
Pertinent Background	Was approximately 20m from blast. Thrown backward by blast, did not hit head. No LOC. Complains of vague right upper quadrant abdominal pain. Eventually decompensates due to liver laceration.
Acting Instructions	Complains of vague right upper quadrant abdominal pain, "scratch" on his abdomen with small amount of blood. You are able to walk from site when told to and have been assisting with evacuation efforts. Sometime later, you become fatigued and your pain has worsened. During repeat exam, *you become* disoriented and anxious
Intended Triage Status	Initial: **Green (minor injuries)**, Revised**: Red (life-threatening injuries)**

Patient 6 Name and Age	20 yo
Pertinent Background	This patient is suffering from a burn injury due to the blast. Third degree burns on skin. Patient has soot located around mouth – the patient has decreased mentation, is slightly anxious, and moderately vocal with some difficulty speaking.
Acting Instructions	This person is confused and altered. Patient is slightly anxious, coughing, and has some difficulty speaking. You become more obtunded and have increasing dyspnea prompting team to intubate/bag mask. Once team has made decision to intubate - facilitator uncovers adjacent Sim Man manikin and the remainder of the simulation can take place with the mannequin.
Intended Triage Status	RED

Patient 7	27 yo
Pertinent Background	You were close to the epicenter of the blast. You are dead.
Acting Instructions	You are dead. You are found covered in debris, in a heap. You are not breathing, and you do not respond.
Intended Triage Status	Black

Patient 8 Name and Age	23 yo
Pertinent Background	Patient is in early 20s who exhibits a huge, gaping abdominal wound and evisceration. Patient is responsive and in extreme distress, screaming dramatically. His screaming becomes less vigorous over time until it ceases during examination. PMH: No significant hx
Acting Instructions	Screaming dramatically. Screaming becomes less vigorous over time until it ceases during examination and patient becomes limp. Unresponsive afterwards.
Intended Triage Status	Black

ACTOR INSTRUCTIONS: MASS SHOOTING SIMULATION

Patient 9 Name and Age	35 yo
Pertinent Background	Patient is a 35yo who was standing next to someone who was shot, so she has blood splatter on her shirt. She was then pushed over by others trying to evacuate the scene after the shooting. She banged her right knee on the cement and has scratches on her face and hands from the fall. She is otherwise fine and has no acute medical conditions. She is sitting alone on the ground where she was pushed over.
Acting Instructions	This person is clearly in distress—crying, holding her knee in pain, and yelling about what she has just witnessed. She is fixated on her knee pain and the blood on her shirt, and she yells for help and asks why no one is helping her. When asked by the team to help others, she refuses to help. This person is most importantly a distraction from the more critical patients.
Intended Triage Status	Green

Patient 10 Name and Age	27 yo
Pertinent Background	Upon hearing active shooter alert over the intercom, quickly hid and barricaded herself in a storage room. Complains of left wrist pain and is crying. She does not recall any trauma to her arm, but she was so frantic during the shooting that she thinks she might have injured herself without noticing it.
Acting Instructions	Upon hearing active shooter alert over the intercom, quickly hid and barricaded herself in a storage room. Holding left wrist and crying. She does not recall any trauma to her arm, but she was so frantic during the shooting that she thinks she might have injured herself without noticing it.

Intended Triage Status	Green

Patient 11 Name and Age	27 yo
Pertinent Background	Patient laying on the ground after jumping out of a window to escape the shooter. Mentation is disordered with confusion on what happened, is slightly anxious, and moderately vocal, complaining about being unable to feel or move his legs.
Acting Instructions	This person should be asking for help. Person should avoid moving or using his legs in any way. He is still able to move his upper body and complains of general body aches. Complains of feeling numb in both legs and sensation below umbilicus is reduced on exam.
Intended Triage Status	Yellow

Patient 12 Name and Age	24 yo
Pertinent Background	The patient was shot in the right butt cheek while fleeing the scene of the shooting.
Acting Instructions	You were fleeing the scene and were shot in the right butt cheek. You have a ¼" entry wound, but no exit wound. You have some minor bleeding. It is painful to lay supine, sit, or stand without assistance. You are found lying stomach down, A+Ox4.
Intended Triage Status	Yellow/Green

Patient 13 Name and Age	30 yo
Pertinent Background	Patient is a 30 yo female who sustained a direct, close-range shot to the abdomen (LUQ). She is curled in a fetal position on the ground. The wound is bloody, swollen, and bruised. She is conscious but pale, anxious, diaphoretic, and vomiting frank blood. Additionally, she complains of pain in her left shoulder.
Acting Instructions	This person is ill-appearing and less communicative. She is curled in a fetal position on the ground and vomiting frank blood. She complains of pain in her left shoulder.
Intended Triage Status	Red

Patient 14 Name and Age	65 yo,

Pertinent Background	65 year old was running away from the shooter. He was shot from ~25ft away in the right upper back (below the scapula) and the bullet exited the right upper axillary area under his arm (arm was missed). He was able to stand up briefly and tried to evacuate the scene, but he had to stop after 10 yards and sit against a wall due to pain and increasing SOB. His left hand is covering his exit wound as he tries to apply pressure. The back of his shirt is saturated with blood around the entry wound. He is confused on questioning (hypoxic).
Acting Instructions	He was able to stand up briefly and tried to evacuate the scene, but he had to stop after 10 yards and sit against a wall due to pain and increasing SOB from tension pneumothorax. His left hand is covering his exit wound as he tries to apply pressure. Confused on questioning.
Intended Triage Status	Red

Patient 15 Name and Age	55 yo
Pertinent Background	No demographic or past medical information Was found by SWAT crew ten minutes after mass shooting in a puddle of blood.
Acting Instructions	Patient is already dead. GSW to left forehead.
Intended Triage Status	

Patient 16 Name and Age	30 yo
Pertinent Background	30yo shot at close-range 2 times. Patient lying on the ground motionless with large amount of blood in mid abdomen.
Acting Instructions	Should provide feedback (hold card) when auscultation is performed to confirm that there are no respirations when airway is positioned and that there is no pulse when central pulses are palpated
Intended Triage Status	BLACK

Appendix 4: Brief outline of patient vignettes for both scenarios

Patient Number	**START Triage Code**	**Brief Description**	**Key Points**
Scenario 1: Bombing at a sports stadium			
1	Green	Thrown back by blast, superficial abrasions	Anxious, lots of noise, attracting a lot of attention. Don't let patient draw your efforts away from other more critical patients.
2	Green	Minor scrapes, doing well	Can help responders!
3	Yellow/ green	Blast Injury (shock waves), confusion, loss of hearing	Dealing with patients that cannot follow commands.
4	Red	Crush injury, open femur fracture, unconscious	Stop the bleeding, stabilize the limb for transport. Still breathing
5	Red	Tachycardia, tachypneic, soot around mouth	Inhalation injury. Need to protect airway

6	Black	Killed in blast, not responding or breathing	No spontaneous respirations after head thrust. Already dead when responders arrive.
7	Black	Huge gaping abdominal wound, intestines out, still responding and screaming	Codes after responders arrive. Focus interventions on other patients that can be helped.
Scenario 2: Mass shooting in an office building			
1	Green	Anxious, tachycardic, no obvious injuries or wounds	Don't let this patient draw care away from more critical patients
2	Green	Injured during chaos after shooting, painful arm, neurovascularly intact	Neuro/pulses intact – ok for now
3	Yellow	Jumped out window, fracture of feet and spine, paresis	Neuro check- nothing below belly button
4	Green	Gunshot wound to the buttock	In a lot of pain, but only needs wound packing initially
5	Red	Shot to abdomen, active hematemesis. Patient in shock, severity of injury unclear from initial patient presentation.	Don't miss small entry chest or abdominal wound projectile injuries
6	Red	Shot to lateral chest wall, single bullet wound, absent breath sounds on right side, tachycardia, SOB, hypotension	Tension pneumothorax. Urgent intervention.
7	Black	Shot to midline abdomen, exsanguinated, no pulses, no breathing with head thrust	Patient dead before responders arrive.

Appendix 5: Pre- and Post-Training Survey Questions

Question Number	**Asked on Pre-Survey**	**Asked on Post-Survey**	**Question**
1	X	X	Year in medical school (M1/M2/M3/M4/MSTP)
2	X	X	Have you completed any of the following (please check all that apply): Emergency Medicine Acute Care Surgery Wilderness Medicine Elective Basic Life Support (BLS) Advanced Cardiac Life Support (ACLS) Advanced Trauma Life Support (ATLS)
3	X	X	Are you aware of what the Mass Casualty Incident Protocol is? (Yes/No)
4	X	X	How likely are you to respond in a Mass Casualty Incident? (Not likely at all/Not likely/Neutral/Likely/Very Likely)
5		X	The simulation environment was realistic and conducive to learning (Strongly disagree/Disagree/Neutral/Agree/Strongly agree)
6		X	Completing the simulation helped me to better understand the classroom information (Strongly disagree/Disagree/Neutral/Agree/Strongly agree)
7		X	It is important to include disaster management training in the curriculum (Strongly disagree/Disagree/Neutral/Agree/Strongly agree)