

# Abstracts of Scientific Papers-WADEM Congress on Disaster and Emergency Medicine 2017

## Gaming: A Unique Way to Teach Active Shooter Preparedness and Response in Healthcare

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**Study/Objective:** Utilize non-competitive gaming to teach health care providers and students how to prepare and respond to active shootings in clinical settings, and as a prologue to a functional exercise.

**Background:** Active shooter incidents are increasing. Unique to health care settings, staff and professionals must weigh the duty to save themselves with their oath to care for their patients. Delays in decision making could be disastrous. Hospitals have ethical and legal obligations to train personnel, but may not train through simulation. Gaming has been shown to be an effective health care teaching method, yet it's an alien concept for active shooter training. Using this technique, participants can employ comprehensive plans within a simulated environment.

**Methods:** We developed an active shooter board game, using a health care venue as the setting. Upon hearing simulated gunshots, the players, acting as themselves in one game, and a fictional role in the second game, must decide whether to run, hide, and/or fight. They must also determine what actions, if any, to undertake for their patients, and what improvisational tools they have to barricade and fight with. Pre- and post-evaluations were administered to assess game efficacy and utility.

**Results:** After two games, health care students (N=12) felt they had additional knowledge and training to react quickly and save lives, barricade themselves, develop improvised weapons, and safely escape. Based on their critique, we have improved the reality and chaos that can occur during an active shooter event in a health care facility.

**Conclusion:** Health care professionals must balance ingrained duties to their patients, colleagues, and themselves. Practicing active shooter situations in a no-threat environment is imperative. Gaming is one inexpensive modality facilities can employ to train providers and students – a precursor to a functional exercise. It opens the dialogue for threat assessment and mental health treatment to address the long-term effects to everyone involved.

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## Simulating a Multi-Hazard Response: A Tabletop Exercise with Response Agencies in Belize

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**Study/Objective:** The overall objective of this tabletop exercise (TTX) was to bring together the Ministry of Health (MOH) and National Emergency Management Organization (NEMO) of Belize, in order to test the MOH's recently developed National All-Hazards Response Plan.

**Background:** Belize experiences various natural disasters on an annual basis. Hurricanes, floods, and mudslides are cause for most concern, and often result in large amounts of standing water, structural damage, and an increased burden on the health care system. Additionally, infectious disease outbreaks such as Dengue, Chikungunya, and most recently, Zika have occurred placing even more demand on already limited resources. In 2014-2015, the MOH of Belize, with technical assistance from CDC's Global Response Preparedness Team (GRPT), developed national- and district-level all-hazard response plans. In order to test the quality of those plans, a tabletop exercise was conducted.

**Methods:** The Global Response Preparedness Team used standardized templates from the Homeland Security Exercise and Evaluation Program (HSEEP) in order to develop a TTX based on the scenario of a Category 5 hurricane with a subsequent increase in cases of Dengue and Zika.

**Results:** The outcome of the TTX was largely positive in that MOH and NEMO demonstrated a strong capability to work together in order to address response issues. However, areas for improvement were highlighted including: 1) the need for additional partners, such as private clinics and laboratories, to participate in the exercise process; 2) the need for better sharing of plans across health districts; and 3) the need for response costing tools in order to better budget for emergencies.

**Conclusion:** The TTX was an overall success in demonstrating the functionality of the all-hazards response plan. This allowed for national partners to continue to build necessary relationships, and highlighted clear next steps for action in order to better prepare the nation for a multi-hazard response.

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## Austere Environment Immersion Training for Disaster and Emergency Medical Personnel

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**Study/Objective:** To explore methods of enhancing the self-efficacy of emergency medical responders performing clinical skills in austere environments.

**Background:** Numerous medical organizations descend upon global disasters to offer assistance where the health care and emergency response infrastructure is often fragmented and unreliable. Many civilian clinicians who volunteer to participate on such teams have never provided care in environments with dynamic, unpredictable, or hazardous conditions. The psychological and physiological stressors imposed on these clinicians may affect their ability to render care effectively in these settings.

**Methods:** We created an 8-hour, continuing education course on rendering aid in the austere environment that was piloted twice using paramedics and physicians who were affiliated with law enforcement or military tactical response teams. The course consisted of three hours of didactic instruction and five hours of various training evolutions using hi-fidelity patient simulators and trained medical actors. The training evolutions involved clinical skills, techniques for rendering care in sensory deprivation and overload conditions, and a final training exercise involving realistic situations in which skills were applied and evaluated.

**Results:** The two pilot course audiences' consisted of clinicians who had previous exposure to rendering various types of combat casualty care. In spite of this previous training and real world experience, the participants reported feeling better prepared to act clinically following immersion in simulated training environments that could realistically simulate hazardous environmental conditions.

**Conclusion:** Simulation of severe environmental conditions is an essential component of the education of clinicians who have roles rendering medical care in austere environments. A main feature of this training was the sensitization of the participant to external stressors and the ability of that participant to apply cognitive and psychomotor skills in less time and with more reliability throughout the training. Future training of clinicians deploying to harsh environments should consider the use of these training modalities.

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### A Table Top, Mass Casualty Incident Simulation to Identify Emergency Department Flow and Capacity Issues

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**Study/Objective:** Table-top simulation to identify gaps in a hospital's preparedness and help assess its ability to respond to a Mass-Casualty Incident (MCI).

**Background:** Mass-Casualty Incidents (MCI) occur throughout the country, and hospitals traditionally utilize disaster drills with volunteers as simulated patients, which is a very time-consuming

and person-intensive process. The Hospital Surge Evaluation Tool is a table-top simulation designed to identify gaps in a hospital's preparedness and assess its ability to respond to a MCI. **Methods:** The ASPR/RAND assessment tools were used to simulate a MCI from a bomb explosion. The exercise was designed to test whether the hospital can rapidly shift into disaster mode, clear space in the Emergency Department (ED), create space in the inpatient units or create new spaces, and effectively coordinate with the command center. Based on criteria entered into a generator tool, a random list of patients "presenting" to the ED is created with increasing numbers and acuity "presenting" every 15 minutes for 60 minutes. The ED staff (physician, charge nurse) assessed each patient on the list as red, yellow, or green and determined the appropriate level of care needed. If the patient needed to be transferred to an inpatient floor (med/surg or ICU), the ED called the command center. Using real-time, current census & staffing, the command center (incident command, bed/staff tracking) determined the appropriate destination (floor, ICU, OR) that the patient could be moved to and informed the ED. Incident command also had to determine other resources like staffing & supplies and calling the appropriate departments.

**Results:** The simulation was useful, but there were some assumptions and limitations that would deter it to happen as smoothly or as quickly. Patients would likely be kept in the ED longer. There are some limitations to the tool and manual entry is needed.

**Conclusion:** Table-top simulation exercises simulating MCI helped identify ED flow issues and creative solutions.

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### Challenges in Conducting Disaster Simulations

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**Study/Objective:** The objective of this study is to identify gaps and shortfalls of disaster simulation, in preparedness and coordination of multiple-jurisdictional integrated response, to a national catastrophic event, testing plans, critical response and recovery functions.

**Background:** The emergency management could include Preparation & Protection, Mitigation Respond, and Recovery. While the purpose of disaster simulation are to assess and validate our capabilities and role in the communications, critical resource logistics and distribution, mass care, medical surge, citizen evacuation and shelter-in-place, emergency public