

necessity, so SOPs can be implemented to teach non-medics. The medics will be needed for the first aim of disaster medicine.

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Neuropsychiatric Manifestations of Wildfire Exposure

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Introduction: Wildfires are life threatening incessant fires in thickly vegetated areas that spread extremely rapidly to human habitat and are difficult to control by human force. The impact of wildfires is enormous on population health and causes tremendous financial burden to individuals and communities.

Aim: The aim is to understand the potential disease burden secondary to wildfires both at an individual and population level and reflect upon the immediate and delayed neuropsychiatric manifestations of smoke exposure.

Methods: Data on wildfires associated direct and indirect costs on individual health and health care delivery appears to be scant. The effort of this presentation is to present the federal data from 2012 to 2016 on nationwide wildfires, estimated acreage consumed in wildfires, the population exposed, and deaths. Information was extracted from the National Interagency Fire Center, the United States Fire Administration, and the Federal Emergency Management Agency. Through literature review on neuropsychological sequelae of wildfires smoke inhalation and associated trauma, the goal is to reflect upon potential healthcare burden secondary to neuropsychiatric manifestations.

Results: Per National Center for Health Statistics, the national fire death rates from 2012 to 2016 ranged 10 to 11 per million population each year, and the property loss both residential and non-residential was estimated at 9 to 10 billion dollars each year. We know healthcare cost is expensive in the United States, and with the stated estimates, one can only envision the health care and public health system burden.

Discussion: The characteristic neuropathology of carbon monoxide toxicity is bilateral Globus pallidus necrosis and the common neuropsychological symptoms include fatigue, affective conditions, emotional distress, memory deficits, sleep disturbance, vertigo, dementia, and psychosis. The health effects and associated disability demand policymakers to allocate resources for wildfire prevention/containment and primary health care providers education, research, and building effective healthcare delivery systems.

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Next Level Triage: Applications of Point-of-Care Ultrasound in Disaster Response and Recovery

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Introduction: Ultrasound applications are widespread, and their utility in resource-limited environments are numerous. In disasters, the use of ultrasound can help reallocate resources by guiding decisions on management and transportation priorities. These interventions can occur on-scene, at triage collection points, during transport, and at the receiving medical facility. Literature related to this specific topic is limited. However, literature regarding prehospital use of ultrasound, ultrasound in combat situations, and some articles specific to disaster medicine allude to the potential growth of ultrasound utilization in disaster response.

Aim: To evaluate the utility of point-of-care ultrasound in a disaster response based on studies involving ultrasonography in resource-limited environments.

Methods: A narrative review of MEDLINE, MEDLINE InProcess, Epub, and Embase found 20 articles for inclusion.

Results: Experiences from past disasters, prehospital care, and combat experiences have demonstrated the value of ultrasound both as a diagnostic and interventional modality.

Discussion: Current literature supports the use of ultrasound in disaster response as a real-time, portable, safe, reliable, repeatable, easy-to-use, and accurate tool. While both false positives and false negatives were reported in prehospital studies, these values correlate to accepted false positive and negative rates of standard in-hospital point-of-care ultrasound exams. Studies involving austere environments demonstrate the ability to apply ultrasound in extreme conditions and to obtain high-quality images with only modest training and real-time remote guidance. The potential for point-of-care ultrasound in triage and management of mass casualty incidents is there. However, as these studies are heterogeneous and observational in nature, further research is needed as to how to integrate ultrasound into the response and recovery phases.

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No More Suffering: Building Human Resource Capacities with the Sphere Standard

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Introduction: Nankai Trough earthquake, with an anticipated death toll of 323,000, is a disaster for which the country of Japan set the highest priority on building capacities. Tokushima prefecture aims to minimize preventable death among survivors and has strived to build a medical and health response system and strengthen outreach systems for vulnerable populations. To actualize these aims, Tokushima prioritized human resource development.

Methods: Tokushima has initiated periodic trainings based on the Sphere Standard, the internationally recognized minimum standards for humanitarian aid, since 2015. The trainings were conducted by certified trainers and trainees received an official certification recognized by the Sphere Project, Geneva. The training materials were localized and the trainings were contextualized to Japan as a developed and super-aged nation. The learning outcome was evaluated by a pre-post test.

Results: Between April 2015 and November 2018 the two-day training was held seven times. There were two hundred twelve participants from various clusters such as health, education, logistics, nutrition and food, security, and protection. The results of the pre-post test were statistically significant (still in process) indicating the effectiveness of the training on knowledge. Training evaluations suggest nurturing ethical attitudes and skills utilizing the Sphere Handbook.

Discussion: Despite under-recognizing the Sphere Standard in Japan, the Standard has been incorporated into the disaster risk reduction plan in Tokushima. For larger scale human resource development, training local representatives to be trainers would be the next step.

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Novel Delivery of Meaningful EMS and Disaster Medicine Content to Residents and Medical Students

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Introduction: Residency education delivery in the United States has migrated from conventional lectures to alternative educational models that include mini-lectures, small group, and learner lead discussions. As training programs struggle with mandated hours of content, prehospital (EMS) and disaster medicine are given limited focus. While the need for prehospital and disaster medicine education in emergency training is understood, no standard curriculum delivery has been proposed and little research has been done to evaluate the effectiveness of any particular model.

Aim: To demonstrate a four-hour multi-modal curriculum that includes lecture based discussions and small group exercises,

culminating in an interactive multidisciplinary competition that integrates the previously taught information.

Methods: EMS and disaster faculty were surveyed on the previous disaster and prehospital educational day experiences to evaluate course content, level of engagement, and participation by faculty. Based on this feedback, the EMS/Disaster divisions developed a schedule for the four hour EMS and Disaster Day that incorporated vital concepts while addressing the pitfalls previously identified. Sessions included traditional lectures, question and answer sessions, small group exercises, and a tabletop competition. Structured similarly to a strategy board game, the tabletop exercise challenged residents to take into account both medical and ethical considerations during a traditional triage exercise.

Results: Compared to past reviews by emergency medical faculty, residents, and medical students, there was a precipitous increase in satisfaction scores on the part of all participants.

Discussion: This curriculum deviates from the conventional education model and has been successfully implemented at our 3-year residency program of 66 residents. This EMS and Disaster Day promotes active learning, resident and faculty participation, and retention of important concepts while also fostering relationships between disaster managers and the Department of Emergency Medicine.

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A Novel Strategy to MCI Management

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Introduction: On February 6, 2018, a 6.0 magnitude earthquake struck Hualien, a county of East Taiwan. Hualien Tzu Chi Hospital, the only tertiary hospital in East Taiwan, activated the mass casualty incident (MCI) call and received 144 patients that night. Our operation did not perform satisfactorily despite regular MCI drills. Thus, a new strategy to cope with the increasing frequency of disaster-related MCIs was developed.

Aim: To facilitate the management of disaster-related MCIs, we developed a novel Disaster Response System which includes a triage system combining Simple Triage and Rapid Treatment (START) and Five-Level Taiwan Triage and Acuity Scale (TTAS), a novel registration system for MCIs, and anonymous patient identification and reporting system.

Methods: We begin the triage with the START method and then shift to the TTAS. The new registration system only needs the patient's gender, age, and triage category. Patients are then assigned to different treatment areas accordingly. Further dispositions are applied after initial stabilization management. To identify the anonymous disaster victims, we take photographs of victims after clean-up and display them on an electronic bulletin with the patient list to the families in our emergency department. Real-time casualty statistics are collected automatically and synchronized to the governmental administrative system.

Results: This novel Disaster Response System reduces the time from patient arrival to definite treatment and disposition in a simulated mass casualty incident exercise. The victim