assessments would help demonstrate improved trainee knowledge, confidence, and disaster medicine skills.

Methods.—Diverse groups of medical university students, healthcare professionals, and community members were enrolled between 2011 and 2014. The course consisted of an online questionnaire, didactic lectures, small-group exercises and 2 live, multipatient mass casualty incident (MCI) scenarios. When not participating as responders during an MCI, trainees served as patients, significantly increasing the “chaos” of the scenario. They also filled out team performance observations cards, greatly simplifying performance data collection.

Results.—Seven hundred and eight participants completed training between November 2011 and August 2014, including 49.9% physicians, 31.9% medical students, 7.2% nurses, and 11% various other healthcare professions. All participants completed the pretest and 71.9% completed the post-test, with average correct answers increasing from 39% to 60%. After didactics, trainees met 73% and 96% of performance objectives for the 2 small group exercises and 68.5% and 61.1% of performance objectives for the 2 MCI scenarios. Average trainee self-assessment of both overall knowledge and confidence with clinical disasters improved from 33/100 to 74/100 (overall knowledge) and 33/100 to 77/100 (overall confidence). The course assessment was completed by 34.3% of participants, 91.5% of whom highly recommended the course.

Conclusion.—Our EPT course demonstrated improved trainee knowledge, confidence, and disaster medicine skills with the help of trainees acting as responders, patients, and observers. This unique EPT curriculum may help educators with limited resources implement performance-based medical team training effectively and efficiently.

A Novel Cooling Method and Comparison of Active Rewarming of Mild Hypothermia

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Introduction.—No current technique has been established to effectively rewarm hypothermic victims in the prehospital environment, and testing treatments with established cooling models is suboptimal.

Objectives.—To compare the effectiveness of arteriovenous anastomosis (AVA) vs heated intravenous fluid (IVF) rewarming in hypothermic subjects. Additionally, to develop a novel method of inducing mild hypothermia.

Methods.—Eight subjects underwent 3 cooling trials each to a mean core temperature of $<35^{\circ}\text{C}$ by 14°C water immersion for 30 minutes, followed by walking on a treadmill for 5 minutes for convective “afterdrop” cooling. Core temperatures changes (Δtes) and rates of cooling ($^{\circ}\text{C}/\text{h}$) were measured by continuous esophageal measurements. Participants were then rewarmed by 1) control: shivering in a sleeping bag; 2) IVF: shivering in sleeping bag and infusion of 2 L normal saline warmed to 42°C at 77 mL/min; 3) AVA: shivering in sleeping bag and circulation of 45°C warmed fluid through neoprene pads affixed to the palms and soles of the feet.

Results.—Cold water immersion resulted in $0.5^{\circ}\text{C} \pm 0.5 \Delta\text{tes}$ and $1^{\circ}\text{C} \pm 0.3 \Delta\text{tes}$ with afterdrop ($P < .01$); with an immersion cooling rate of $0.9^{\circ}\text{C}/\text{h} \pm 0.8$ vs $12.6^{\circ}\text{C}/\text{h} \pm 3.2$ with afterdrop ($P < .001$). After cooling, core temperatures reached a nadir of $35.0^{\circ}\text{C} \pm 0.5^{\circ}\text{C}$. There were no significant differences in rewarming rates between the 3 conditions (shivering: $1.3^{\circ}\text{C}/\text{h} \pm 0.7$, $R^2 = 0.683$; IVF: $1.3^{\circ}\text{C}/\text{h} \pm 0.7$, $R^2 = 0.863$; and AVA: $1.4^{\circ}\text{C}/\text{h} \pm 0.6$, $R^2 = 0.853$; $P = .58$). Shivering inhibition was greater with AVA, but not significantly different ($P = .07$).

Conclusion.—This study developed a novel and efficient model of hypothermia induction through exercise-induced convective afterdrop. Although there was not a clear benefit in either of the 2 active rewarming methods, AVA rewarming showed a trend toward greater shivering inhibition, which may be optimized by an improved interface.

Down to the Wire? Ventilation During Intubated Stretcher Helicopter Winching

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Introduction.—The stretcher winching of intubated patients into a helicopter is an uncommon procedure. Positive pressure ventilation is required, which can be performed either manually with a self-inflating bag or automatically using a mechanical ventilator. The optimal method of ventilation has not been studied. Automatic ventilation has theoretical advantages in maintaining better oxygenation and stable arterial carbon dioxide levels, with less risk of airway disconnection. There is also likely to be better performance and situational awareness of the stretcher attendant during the winch, contributing to crew and patient safety. However, the ability to diagnose and manage airway disconnections and ventilator failure is of concern.

Objective.—To compare automatic vs manual ventilation during intubated stretcher helicopter winching.

Methods.—There were 2 phases to the trial. An initial static winch with a hoisting simulator was performed with 10 stretcher attendants, followed by a live helicopter winch at 30 feet into a Bell 412 with 5 attendants. Each attendant performed 2 separate winches with an intubated mannequin. During one winch the mannequin was ventilated with manual (bag) ventilation; an automatic ventilator was used for the other. Airway pressures were measured.

Results.—The results showed no failure of automatic ventilation. Automatic ventilation was superior to manual ventilation. Automatic ventilation allowed for better situational awareness and perceived performance in winching maneuvers. There was one airway disconnection during a manual ventilation winch into the aircraft.

Conclusions.—Automatic ventilation is superior in providing stable, reliable, uninterrupted ventilation during simulated helicopter winching. The risk of ventilator failure and disconnection is low. Medical retrieval organizations should develop standard operating procedures, equipment, and training to facilitate automatic ventilation during helicopter winching.

Prehospital Interventions During Mass Casualty Events in Afghanistan: A Case Series

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Objective.—Mass casualty (MASCAL) events are known to occur in the combat setting. Data from the Joint Theater wars, specific to MASCAL events, are very limited at this time. We seek to provide preliminary data for developing prehospital planning and guidelines.

Methods.—Cases were identified using the Department of Defense Trauma Registry and the Prehospital Trauma Registry. These cases were identified during the course of an approved quality assurance analysis. Cases that were designated as or associated with MASCAL events were included.

Results.—Fifty cases were identified during the course of this project. The majority (74%, $n = 37$) of those injured were battle injuries. Explosives were the most common cause of injuries. There was a wide range of vital signs. Tourniquet placement (20%) and pressure dressings (19%) were the most common interventions, followed by analgesia administration (15%). Oral transmucosal fentanyl citrate was the most common parenteral analgesic drug administered. Most were evacuated as “routine.” Follow-up data were available for 36 of the subjects, and 97% were discharged alive.

Conclusions.—In this case series, the most common prehospital interventions were hemorrhage control followed by medication administration. This preliminary data set may help develop prehospital guidelines and planning. Larger data sets are need to validate these findings, which may have limited utility in the noncombat setting.

Core Content for Wilderness Medicine Training: Development of a Wilderness Medicine Track within an Emergency Medicine Residency

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Objective.—To create a longitudinal wilderness medicine curriculum or track that can be incorporated into an emergency medicine (EM) residency program.

Methods.—Interest-specific tracks are becoming increasingly popular in EM training. We chose this model to develop our curriculum specific to wilderness medicine (WM). This curriculum may be incorporated into an EM training program. This training would facilitate transition to a WM fellowship or other career in the field for the interested resident. Outlined is a 3-year longitudinal course of study that includes a core didactic curriculum and a plan for graduated levels of responsibility. The core content is specifically related to the required EM core content for residency training. The track enhances the WM specific core content for the EM residents as a whole, in addition to providing each WM track resident with additional focused WM didactics, skills, and teaching opportunities. Finally, the track allows the resident to align his or her research, didactic, and administrative project requirements of the EM program within the field of WM study. The WM track curriculum is easily modified to fit the particular needs of individual residency programs.

Results.—We present a model core content curriculum for a WM track for training within an EM training program.

Conclusions.—This WM curriculum would give residencies a framework that can be used to foster learning for the residents interested WM. It enhances the coverage of wilderness core content education for all of the EM residents in the program. It provides wilderness- and environmental-specific education and experience for interested residents, allowing them to focus on an area of study, enhancing their CVs at graduation. Finally, given the popularity of WM, the presence of a WM track may potentially improve recruitment for the residency program.

Prospective Double-Blinded Randomized Field-Based Clinical Trial of Metoclopramide and Ibuprofen for the Treatment of Acute Mountain Sickness

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Introduction.—Acute Mountain Sickness (AMS) afflicts 50% to 80% of high-altitude travelers, and can be debilitating. AMS is defined as headache with nausea/vomiting, fatigue/weakness, dizziness/lightheadedness, and/or difficulty sleeping because of rapid ascent. Because patients with AMS often are nauseated, metoclopramide may be a solution, as it treats nausea and migraine headaches. Studies also suggest ibuprofen as effective AMS therapy.

Objective.—Assess the effectiveness of metoclopramide compared with ibuprofen for AMS treatment.

Methods.—We performed a prospective, double-blinded, randomized, field-based clinical trial of 10 mg metoclopramide vs 400 mg ibuprofen for AMS treatment. Enrollment was March to May 2013 and March to April 2015 along the approach to Mount Everest in Pheriche (4280 m) and Dingboche (4358 m), Nepal. Eligibility criteria were ≥ 1000 vertical feet gain over 24 hours with a headache and one other AMS symptom. Patients with severe AMS, high altitude cerebral edema, or high-altitude pulmonary edema were excluded. Subjects were assessed by vital signs, Lake Louise Score (LLS), and a Visual Analog Scale for headache and nausea severity immediately prior to treatment, and then serially at 30, 60, and 120 minutes afterwards. Results were analyzed by signed-rank and Wilcoxon rank-sum tests (P values $< .05$ considered significant).

Results.—Analysis revealed no significant differences between metoclopramide and ibuprofen groups with respect to age, sex, initial LLS, heart rate, or oxygen saturation. Both medications significantly reduced headache severity and nausea compared with initial headache and nausea over the 2-hour study. At 120 minutes, metoclopramide additionally reduced nausea to a greater degree than ibuprofen, although both medications reduced overall AMS symptoms. When the LLS was used, there was a significant decrease in headache, dizziness, and total LLS with ibuprofen compared with metoclopramide.

Conclusion.—Both medications effectively reduced AMS symptoms, including headache and nausea. Metoclopramide additionally reduced nausea

more than ibuprofen. Therefore, metoclopramide may be an effective alternative AMS treatment, especially for patients with nausea.

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Promoting Resilience Among Veterans Using Wilderness Therapy

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Introduction.—Mental health problems are common among combat veterans. Although the US government has set aside resources to treat these individuals, long wait times, stigma related to receiving treatment, and the perception of few treatment benefits remain barriers for soldiers seeking mental-health services. One alternative to traditional psychotherapy is wilderness therapy, which uses the natural environment to promote recovery.

Objective.—The purpose of the present research was to expand on the literature and our previous findings by measuring the mental health of 7 groups of combat veterans on long-distance (ie, 4–6 months) hiking and paddling trails.

Methods.—Veterans completed pre-, mid-, and posthike measures aimed at gauging their mental-health functioning. We also emailed them weekly psychoeducational messages about how they might think and behave in ways to promote well-being. For 3 of the trails, we hiked with the veterans for 2 days at the beginning of their wilderness experience.

Results.—Preliminary data analyses for veterans in our wilderness therapy program vs those in a waitlist control group indicated larger gains in mental health across 11 variables for those in the treatment group. Even with a small sample size ($N = 31$), we found statistically significant differences between groups for anxiety ($P < .001$), phobic anxiety ($P = .04$), and interpersonal sensitivity ($P = .03$), and a marginally significant difference in overall mental health ($P = .06$).

Conclusions.—For a generation of post-9/11 combat veterans who may not benefit from traditional approaches to therapy, our wilderness therapy program showed promise as a way for veterans to address issues related to experiencing traumatic events while deployed. We found significant decreases in general anxiety, anxiety related to fear or uneasiness when in new places and around crowds, and feelings of wariness or self-consciousness around others.

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Ambulatory Blood Pressure Monitoring Reveals Increased Sleeping Blood Pressure in Hypertensive Individuals at High Altitude

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Introduction.—For those traveling to high altitude, it has been postulated that blood pressure (BP) changes when compared to sea level. Also at altitude, periodic breathing has been well described and is correlated to decreased sleep quality.

Objective.—Measure continuous sleeping and awake blood pressures in both normotensive and hypertensive Himalayan trekkers.

Methods.—Blood pressure was measured with Welch-Allyn 6100 24h ambulatory BP monitors (24h-ABPM) every 30 minutes while awake and every