vious experience with NVGs. The average times for EI in ambient light and NVGs were 48.4 and 188.2 secs, respectively (SE = 13.4 for both, $p < .0001$). The average times for IVI in ambient light and NVGs were 34.7 and 73.7 secs, respectively (SE = 4.1 for both, $p < .0001$). Difficulties encountered using NVGs included loss of depth perception and the need to frequently refocus the device. **Conclusions:** Emergency physicians and paramedics were able to successfully perform ALS skills while wearing NVGs, but times were slower than in ambient light. Tactical or military personnel who may need to use NVGs to provide emergency care in a dark environment should train routinely to adapt to their limitations.

**497 Effect of Personal Protective Equipment (PPE) on Rapid Patient Assessment and Treatment during a Simulated Chemical Weapons of Mass Destruction (WMD) Attack** *Selim Suner, Kenneth Williams, Marc M Shapiro, Leo Kobayashi, Robert Woolard, Francis Sullivan; Brown University: Providence, RI*

**Objective:** To evaluate the effect of PPE on components of rapid assessment and treatment of a victim in a simulated contaminated environment. The variables chosen are used in many current triage and rapid treatment protocols for patients with chemical exposure. **Methods:** Health care providers (HP), treating a high-fidelity mannequin simulated patient, were asked to independently communicate (CM); determine the heart rate (HR) and respiratory rate (RR); manage the airway (AM); and inject medications intramuscularly (IM). The mannequin was supine, on the ground under normal environmental conditions and during a simulated chemical terrorist attack. All HPs were provided with AM equipment and auto-injectors. HPs were observed through a one-way mirror. Time to intervention and accuracy of vital sign classification (low, normal, and high) were recorded by a trained observer. HPs assessed and treated a simulated patient with and without PPE (chemical suit and a full-face all-hazards filtered mask) in a randomized double crossover design and served as their own control. Each subject repeated assessment variables 3 times for each condition. Proportion of errors (ERR) was calculated for each group and statistically tested using repeated-measures ANOVA (SAS software). **Results:** 31 health care providers were 55% male and had an average 4 years of clinical experience. HPs were 55% EMT, 7% nurse, and 38% physician. AM success rate was 94% for both conditions. Intubation times were $111 \pm 36$ seconds (mean $\pm$ standard deviation) and $109 \pm 42$ seconds for with and without PPE, respectively (t-test; $p = 0.94$). CM ERR was 0.01 with PPE vs. 0.02 without ($p = 0.33$). HR ERR was 0.37 with PPE vs. 0.14 without ($p = 0.0002$). RR ERR was 0.03 in PPE vs. 0.14 without ($p = 0.0099$). IM ERR was 0.40 with PPE vs. 0.30 without ($p = 0.08$). **Conclusions:** PPE has no effect on CM, IM, or AM. RR and HR classification is affected significantly by PPE, suggesting potential for triage errors.

**498 Using DC Oximetry to Detect Exhaustion in Working Firefighters** *Carin M Van Gelder, L Alex Pranger, Lawrence Armstrong, William P Wiesmann, Grant Baxter, Sandy Bogucki; Yale University: New Haven, CT, University of Connecticut: Storrs, CT, Sekos, Inc.: Germantown, MD*

**Objectives:** To determine whether noninvasive direct current (DC) oximetry can identify physiological exhaustion in working firefighters (FFs), and to develop experimental models with which to evaluate this technology. **Methods:** Red LEDs and detecting photodiodes were incorporated into self-contained breathing apparatus (SCBA) face masks for forehead reflectance mode oximetry in working FFs. The pulsatile component of absorbance was processed out to obtain the DC component. In the first experiment, 9 FFs wearing the sensorized SCBAs performed FF tasks in an environmental chamber on 2 separate occasions. In full PPE, FFs completed the protocol at 40°C; 1 week later, they repeated the protocol wearing shorts and T-shirts at 18°C. Oximetry tracings were recorded. Next, wearing dual-wavelength SCBA-based oximeters, 5 FFs in full PPE and a 75-lb weight vest simulating a hose pack exercised on a treadmill at 40°C until fatigued. In addition to absorbance in both red and near-IR ranges, laboratory indices of dehydration and metabolic stress were obtained. Core temperature (Tc) was recorded and heat storage (HS) calculated in both sets of studies. **Results:** In both experiments, $\Delta$Tc and HS over 10-25 min of exercise exceeded OSHA 8-hour limits. One FF in heat/PPE was unable to complete the protocol in the first set of experiments. A marked negative deflection in the oximetric absorbance tracing corresponding to onset of symptoms was observed. In the second experiment, paired t-test results confirmed significant fluid loss and lactate accumulation in all subjects. Obvious deflections in DC oximetry tracings were seen 10-30 sec before volitional fatigue in 4/5 subjects. Increased variability in oximetric tracings was seen in all subjects as they fatigued, and an index of variability was developed. **Conclusions:** Both linear and intermittent exercise models of uncompensable heat stress in FFs suggest that DC oximetry may noninvasively detect exhaustion in working FFs when self-rescue is still possible.

**499 Reduction of Pretest Probability below the Test Threshold Using Clinical Criteria Alone** *Jeffrey A Kline, Alice M Mitchell, Chris Kabrhel, Peter B Richman, D Mark Courtney; Carolinas Medical Center: Charlotte, NC, Mayo Clinic, Phoenix: Scottsdale, AZ, Northwestern Memorial Hospital: Chicago, IL, Massachusetts General Hospital: Boston, MA*

**Objectives:** The risks associated with untreated pulmonary embolism (PE) compel physicians to perform D-dimer testing in low-risk patients. Overtesting can create problems owing to the D-dimer's high false-positive rate. We derive and validate a simple decision rule to identify a subset of patients with a pretest probability low enough to preclude the need for D-dimer testing. **Methods:** The test threshold was estimated at 1.8% according to the method of Pauker and Kassirer (1981). The derivation data included 21 variables collected on 3,148 patients evaluated for PE at 10 emergency departments. Of the derivation patients, 348 (11%) had PE diagnosed. Variables were tested for significance by logistic regression analysis with stepwise backward elimination and exclusion of variables for kappa <0.6.

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# 2004 SAEM ANNUAL MEETING ABSTRACTS

The editors of *Academic Emergency Medicine* are pleased and privileged to present the Original Research Abstracts from the Annual Meeting of the Society for Academic Emergency Medicine, May 16–19, 2004, Orlando, Florida. The exciting trends of emergency medicine research are reflected in these brief summaries, as are the talent, creativity, and enthusiasm of novice as well as more experienced academicians.

This year, 997 research abstracts were submitted and 502 were selected for presentation at the Meeting (not including the 61 Innovations in Emergency Medicine Education Exhibits, which were submitted separately). Each abstract was independently reviewed by up to six designated topics experts who were blinded to the authors. Final determination for scientific presentation was made by the Scientific Subcommittee, chaired by Jeff Kline, and the SAEM Program Committee, chaired by Judd Hollander. The decision for presentation was based on the final review score and the space available for presentation at the meeting.

We present these abstracts as they were received electronically from the authors, who are solely responsible for their content. They appear as they were received; we have done only minimal proofreading of these abstracts. Any questions you may have on their content should be directed to their authors. Presentation numbers precede the abstract titles. An index of key words and authors begins on page 608.

On behalf of the membership of SAEM, the editorial board of *AEM*, and the leadership of our specialty, we express our sincere gratitude to these academicians and the SAEM Program Committee for their continuing effort to improve our patients' care by advancing emergency medicine research and education.

### 001 Aminophylline in Bradyasystolic Cardiac Arrest: A Randomized Placebo-controlled Trial

*Riyad B Abu-Laban, Caroline M McIntyre, James M Christenson, Catherina A van Beek, Grant D Innes, Robin O'Brien, Karen P Wanger, R Douglas McKnight, Kenneth G Gin, Peter J Zed, Jeffrey Watts, Joe Puskaric, Iain A MacPhail, Ross G Berringer, Ruth A Milner; University of British Columbia: Vancouver, British Columbia, Canada, British Columbia Ambulance Service: Victoria, British Columbia, Canada, Centre for Clinical Epidemiology and Evaluation: Vancouver, British Columbia, Canada*

**Objectives:** Case reports and small trials have suggested that aminophylline may facilitate resuscitation from cardiac arrest. Our objective was to determine if the addition of aminophylline to standard treatment leads to an absolute increase of at least 8.8% in the proportion of out-of-hospital adult bradyasystolic cardiac arrest patients who achieve return of spontaneous circulation (ROSC). **Methods:** Patients with asystole or pulseless electrical activity at a rate less than 60/minute after endotracheal intubation, 1 mg IV epinephrine, and 3 mg IV atropine were eligible. Subjects were randomized to receive aminophylline (250 mg IV bolus, followed by an additional 250 mg IV bolus if no ROSC occurred within 90 seconds) or equivalently administered placebo, in a double-blind fashion. Standard resuscitation measures were continued for a minimum of 10 minutes after study drug administration. **Results:** From 01/22/2001 to 09/03/2003, 1,886 cardiac arrests were treated in the study area. Of 1,025 eligible patients, 971 (94.7%) were enrolled (486 aminophylline, 485 placebo). Baseline characteristics and survival predictors were similar in the two treatment groups. The median time from paramedic arrival to study drug administration was 13 minutes. The proportions of patients with non-sinus tachyarrhythmias after study drug were 34.8% in the aminophylline group and 26.2% in the placebo group (p = 0.004). The proportions of patients with ROSC after study drug were 24.5% in the aminophylline group and 23.7% in the placebo group (difference 0.8%: 95% CI –4.6% to +6.2%, p = 0.778). Survival to hospital admission (6.6% vs 7.6%) and survival to hospital discharge (0.4% vs 0.6%) were not statistically different in the aminophylline and placebo groups, respectively. **Conclusions:** Although aminophylline increases non-sinus tachyarrhythmias, we found no evidence in this sufficiently powered study that it significantly increases the proportion of adult patients who achieve ROSC in out-of-hospital bradyasystolic cardiac arrest.

### 002 The Sensitivity of Computed Tomography for the Diagnosis of Subarachnoid Hemorrhage in ED Patients with Acute Headache

*Jeffrey J Perry, Ian G Stiell, George A Wells, Melodie Mortensen, Howard Lesiuk, Marco Sivilotti, Michael Bullard; University of Ottawa: Ottawa, Ontario, Canada, Queens University: Kingston, Ontario, Canada, University of Alberta: Edmonton, Alberta, Canada*

**Objective:** It is recommended that patients with acute headache undergo computed tomography (CT) followed by lumbar puncture (LP) to rule out subarachnoid hemorrhage (SAH). This is based on small studies with CT sensitivity for SAH varying from 90.5% to 100%. Our objective was to determine the CT sensitivity for SAH overall and when done <6 hours from headache onset in patients with normal neurological examination. **Methods:** This prospective cohort study was conducted at 4 university tertiary care EDs. Patients >15 years old, with normal neurological examination, GCS 15, and a complaint of a non-traumatic acute (<1 hour from onset to peak) headache were enrolled over 3 years. Exclusion criteria were history of recurrent headaches, referral of confirmed SAH, papilledema, previous SAH, or brain neoplasm. Physicians completed forms prior to investigations. The outcome criterion, SAH, was defined