99 Retention Rate for Proper Usage of Level C Personal Protective Equipment by Emergency Medical Services Personnel after Six Months

G Michael Mahoney, William E Northington, David P Hostler, Michael E Hahn.
University of Pittsburgh Affiliated Residency in Emergency Medicine, Pittsburgh, PA, University of Pittsburgh, Pittsburgh, PA

Objectives: To assess the 6-month retention rate of training out-of-hospital providers in donning and doffing level C personal protective equipment (PPE).
Methods: In this prospective observational study, 36 out-of-hospital providers enrolled in a paramedic program were trained in donning and doffing of the level C PPE. One subject withdrew because of claustrophobia. A standardized training module and checklist of critical actions developed by a hazardous materials (hazmat) technician were used. Students were trained and practiced with a chemical resistant coverall, butyl gloves, boots, and an air-purifying respirator until they were able to correctly don and doff the level C PPE with 100% proficiency. An investigator used the checklist accompanying the training module to assess proficiency and remediate mistakes. Six months after initial training, the subjects were reassessed using the same investigator and checklist. Errors were designated as either critical (resulted in major self-contamination such as early removal of the respirator) or noncritical (potentially resulted in minor self-contamination not involving the airway).
Results: Six months following initial training, only three (8.3%) subjects were able to don and doff PPE without committing a critical error. The most common critical errors were premature removal of the respirator (63%, n = 23) and actions allowing the contaminated suit to touch the body (52%, n = 19). The most common noncritical error was possible self-contamination due to boots' not being removed prior to exposing other body parts (36%, n = 13). Of the seven (19.4%) subjects with additional previous hazmat training, only one donned and doffed PPE without committing a critical error.
Conclusions: Retention of proper donning and doffing techniques in paramedic students is poor six months after initial training. Even in subjects with previous training, critical errors were common, suggesting that current training may be inadequate to prevent harmful exposures in emergency medical services (EMS) personnel.

100 Cardiac Monitoring of Human Subjects Exposed to the Taser

Saul D Levine, Christian Sloane, Theodore C Chan, Gary M Vilke, James Dunford.
University of California San Diego, San Diego, CA

Objectives: The Taser device delivers sustained high-voltage electricity and is now used as a "less-lethal" weapon by approximately one third of U.S. law enforcement agencies. Although generally regarded as safe, there are no prospective human studies of the Taser despite well-publicized reports of sudden death in association with their use. We sought to evaluate for rhythm changes utilizing cardiac monitoring during deployment of the Taser on healthy human volunteers.
Methods: This prospective, interventional pilot study was performed with police officers receiving training on the Taser X-26. The officers, all of whom had already volunteered to be "tasered," had continuous electrocardiographic (ECG) monitoring immediately before, during, and after the firing of the Taser. Primary endpoints included development of changes in cardiac rate, rhythm, and morphology. Investigators individually analyzed the tracings. Descriptive statistics were used.
Results: 76 subjects were enrolled. 9 subjects were excluded because of equipment malfunction. Of the remaining 67 subjects, the mean shock duration was 2.2 seconds (range 0.9–5.0). Change in heart rate (HR) after Taser shock was significant, with an average increase of 19.4 beats/min (Tables 1 and 2). We observed no change in QRS morphology or aberrantly conducted beats. One subject was found to have single premature ventricular contraction (PVC) before and after the Taser shock, but no other subject was found to have any other dysrhythmia except sinus tachycardia.
Conclusions: Other than an increase in heart rate, there were no cardiac dysrhythmia or ECG morphology changes in human subjects who received a Taser shock. The clinical implications of these findings require further investigation.

Table 1

	Pre-HR (beats/min)	Post-HR (beats/min)
Mean	117	136
95% CI	111 to 123	132 to 141
Range	66 to 160	94 to 190

Table 2

	Δ HR
p-value	<0.0001
95% CI	15.3 to 23.4
Range	−2 to 72

95% CI = 95% confidence interval.

101 Are Patients Arriving by Emergency Medical Services Sicker?

L Albert Villarin, Jonathan Fisher, Brett Sylvia, Sarah Rapone, Carl Chudnofsky.
Albert Einstein Medical Center, Philadelphia, PA, Harvard Beth Israel Deaconess Medical Center, Boston, MA, Tufts University, Boston, MA

Objectives: The inappropriate use of emergency medical services (EMS) remains a concern. The objective of this