The average time required, regardless of instrument, was 13.9 s (range 1.6–149 s). Two tools, the Gerber knife and multi-tool, could not complete the amputation. The scissor lopper was quickest (2.9 ± 0.4 s), significantly faster than any other tool at purely cutting bone ($P < .05$). Amputation with both loppers and the Jaws of Life had more fractures (29 of 35, 83%) versus none with the Sawz-All and the Leatherman Wave saw (0%; $P < .05$).

Conclusions.—All the tools, save the Gerber knife and saw, were able to complete the amputation through the distal femur by different persons with reasonable ease. The Leatherman Wave saw was the safest and easiest to use non-power tool, whereas the Sawz-All was the fastest and safest power saw.

Travis L. Holloway, MD
Salvador Sordo, MD
Heather M. Brandfellner, DO
Andrea L. Goode, BS
Jayson D. Aydelotte, MD
San Antonio, TX, USA

A Randomized Controlled Trial of a Novel Application of Chemical Cold Packs for Treatment of Exercise-Induced Hyperthermia

Background.—Heat-induced illness is common around the world and is associated with significant morbidity and mortality. Despite having never been shown to be effective, a traditional cooling technique in the prehospital environment is applying chemical cold packs (CCPs) to skin covering the large vessels of the neck, groin, and axillae. An alternative placement of CCPs to the glabrous skin surfaces that contain densely packed subcutaneous vascular structures may be more efficacious.

Objective.—The purpose of this study was to compare the cooling effect of CCPs applied to the neck, groin, and axillae versus glabrous skin of the cheeks, palms, and soles for exercise-induced hyperthermia.

Methods.—In this prospective, randomized, crossover trial, 10 healthy adult male volunteers walked on a treadmill in a heated room ($40^\circ\text{C} \pm 0.5^\circ\text{C}$, relative humidity 20% to 35%) wearing insulated military overgarments. Esophageal temperature (T_{es}) was monitored throughout the trials. The primary stop criterion for exercise was $T_{\text{es}} = 39.2^\circ\text{C}$. The subjects then rested in the hot room for 30 minutes. Each subject participated in 3 heat stress trials: a no treatment trial followed by 2 randomly ordered cooling trials, namely, traditional (neck, groin, and axillae) or glabrous (cheeks, palms, soles). Participant trials were separated by a minimum of 2 days.

Results.—With no treatment, T_{es} decreased by $0.3 \pm 0.2^\circ\text{C}$ in the first 5 minutes, then stabilized for the ensuing 25 minutes. With traditional cooling, T_{es} decreased by $0.4 \pm 0.2^\circ\text{C}$ in the first 5 minutes, followed by a linear decline of 0.17°C over 10 minutes. Glabrous skin cooling enhanced the treatment effect:

T_{es} decreased by $0.6 \pm 0.2^\circ\text{C}$ in the first 5 minutes and followed by a linear decline of 0.30°C over 10 minutes ($P < .001$).

Conclusions.—Application of CCPs to glabrous skin was more effective for treating exercise-induced hyperthermia than was the traditional cooling paradigm. This novel cooling technique may be beneficial in reducing the morbidity and mortality of heat illness in the prehospital environment.

John Lissoway, MD
Grant S. Lipman, MD
Dennis A. Grahm, PhD
Vinh H. Cao
Michael Shaheen, MD
Samson Phan, PhD
Eric A. Weiss, MD
Craig H. Heller, PhD
Stanford, CA, USA

Adirondack Park Incidents: A Retrospective Review of Search and Rescue Reports of 2008 and 2009

Background.—The Adirondack Park encompasses a mixture of mountains, forest, wetlands, and waterways and is the largest park in the lower 48 states of the United States. Locals and tourists use this land for hiking, camping, canoeing, hunting, fishing, trapping, snowmobiling, skiing, mountain biking, and rock climbing. Given the large number of people who use the Adirondacks for recreation, there is an equally large number of accidents, injuries, and illness that occur in areas ranging from state-operated campgrounds to remote backcountry.

Objective.—The purpose of this study was to gain insight into the demographics of search and rescue operations in the Adirondack Park.

Methods.—This study is a retrospective review of the Adirondack Park Forest Ranger search and rescue reports from January 1, 2008, through December 31, 2009. Epidemiologic data, including subject demographics, incident, reason for injury, medical care needed, preparation of subject, and prior medical conditions, was gathered from the NY State Department of Environmental Conservation for each report.

Results.—Between 2008 and 2009, 239 search and rescue missions were carried out for 349 subjects. Twenty-eight percent of cases involved an injured subject and 9% involved illness. Fifty-six percent of the subjects had a known prior illness or medical condition or were medication dependent. Twenty-one percent of cases were thought to be due to subjects exceeding their abilities. Of the search missions, 54% of subjects had little experience with the activity and 9% had no experience at all. Only 43% of subjects had any form of orientation equipment with them at the time of rescue.

Conclusions.—This study highlights the importance of continued surveillance of injury and illness in the Adirondack Park. That will aid in educating subjects on the preparation needed for wilderness activities as well as tailoring search and