novative way to apply wilderness medicine skill sets to global health education in medical school in order to best prepare students to work effectively in resource-poor settings.

Amita A. Kulkarni
Liz B. Francis
Jay M. Lemery, MD
Dana L. Sacco, MD
Manhattan, NY, USA

A Prospective Cohort Study of Acute Kidney Injury in Multi-Day Ultramarathon Runners

Objective.—Ultramarathon foot races of distances greater than the traditional 26.2 mile marathon are increasing in popularity, attracting more than 70 000 annual participants worldwide. Prior studies have consistently documented renal function impairment, but only after race completion. The incidence of renal injury during these multi-day ultramarathons is currently unknown. This is the first prospective cohort study to evaluate the incidence of acute kidney injury (AKI) in runners during a multi-day ultramarathon foot race.

Methods.—Demographic and biochemical data gathered via phlebotomy and analyzed by iSTAT (Abbott, NJ) were collected at the start and finish of Day 1 (25 miles), Day 3 (75 miles), and Day 5 (140 miles) during Racing The Planet's 150-mile, 7-day self-supported desert ultramarathons. Pre-established RIFLE criteria, using creatinine (Cr) and glomerular filtration rate (GFR), defined AKI as "No Injury" ($\text{Cr} < 1.5 \times \text{normal}$, decrease of GFR $< 25\%$), "Risk" ($\text{Cr} 1.5 \times \text{normal}$, decrease of GFR by 25%–49%), and "Injury" ($\text{Cr} 2 \times \text{normal}$, decrease of GFR by 50%–75%).

Results.—Thirty racers, 76% male with a mean ($\pm$ SD) age of 39 ± 10 years, were studied during the 2008 Sahara ($n=7$, 23.3%), 2008 Gobi ($n=10$, 33%), and 2009 Namibia ($n=13$, 43.3%) events. The average decrease in GFR from Day 1 start to Day 1 finish was 28 ± 25 ($P < .0001$, 95% CI, 18.5–37.6); Day 1 start to Day 3 finish was 29.6 ± 20.1 ($P < .0001$, 95% CI, 18.4–40.7); and Day 1 start to Day 5 finish was 30.9 ± 17.5 ($P < .0001$, 95% CI, 20.8–41). Runners categorized as Risk and Injury for AKI after Stage 1 was 44.8% and 10%; after Stage 3, 67% and 13%; and after Stage 5, 57.1% and 7.1%.

Conclusions.—The majority of participants developed significant levels of renal impairment. Given the changes in renal function, potentially harmful nonsteroidal anti-inflammatory drugs should be minimized to prevent exacerbating acute kidney injury.

Grant S. Lipman, MD
Garrett Chan, PhD
Sarah Logan, MD
Palo Alto, CA, USA

Brian Krabak, MD
Seattle, WA, USA

Brandee Waite, MD
Anil Menon, MD
Sacramento, CA, USA

Who is Being Rescued in Canadian National Parks?

Introduction.—There has been a growing body of literature reviewing the epidemiology of injuries, illnesses, and search and rescue (SAR) operations in National Parks in the United States. There are 42 National Parks in Canada that experienced over 12 million visitors in 2010. Little research has been published to date on SAR trends in Canadian National Parks.

Objective.—To review the current literature regarding SAR operations in Canadian National Parks and assess the need for further research in this area.

Methods.—Articles in the MEDLINE database were identified that analyzed SAR operations or injury and illnesses occurring in Canadian National Parks. The Parks Canada website was reviewed for relevant information available to the public regarding safety and SAR operations in National Parks.

Results.—One peer-reviewed article was identified that analyzed the epidemiology of SAR operations in Banff, Yoho, and Kootenay National Parks. No further relevant articles were found. From 1994 to 1998, Parks Canada reported a yearly average of 1400 safety incidents in National Parks. Pacific Rim National Park Reserve (PRNPR) is reported to experience the most SAR operations from all National Parks, with the West Coast Trail accounting for 80 to 100 incidents annually. There were 20 accident reports available from the 7 Mountain National Parks in 2010, with 4 self-reported "near-miss" accidents.

Conclusions.—A paucity of data exists regarding SAR operations in Canadian National Parks. Epidemiological studies conducted in the United States may not be extrapolated to Canada due to possible differences in climate, activity rates, and safety programs. A recent study of US National Parks demonstrated the most common SAR environment was the mountain environment, whereas in Canada it is reported that PRNPR, a coastal environment, experiences the highest number of SAR operations yearly. Further research into these incidents is needed before critical analysis and improvement of prevention strategies targeting high-risk areas and activities can be made.

Jonathan A. Malo, MBBS
Townsville, Queensland, Australia

Eiman Zargaran, MD
North Vancouver, British Columbia, Canada

Injury and Illness on the West Coast Trail: Still the graveyard of the Pacific?

Introduction.—The West Coast Trail (WCT) is a 75 km trek in Pacific Rim National Park Reserve on the southwest coast of Vancouver Island, British Columbia, with 4000 to 6000 hikers attempting to complete the trail annually. It is a physically demanding and strenuous hike renowned for its unique infrastructures and violent weather. Parks Canada quotes that 1% to 2% of hikers require evacuation every year, while an additional 200 sustain minor injuries. There is growing literature reviewing injuries and illnesses in US National Parks that consistently show hikers to be the most common group requiring medical