Selected Abstracts From the Wilderness Medical Society's 2011 Annual Scientific Conference

The Epidemiology of Lift-Accessed Downhill Mountain Biking Injuries

Objective.—Lift-accessed downhill mountain biking has grown exponentially in popularity over the past decade. The sport, while offering participants access to a vast amount of terrain, also requires navigating steep and technical terrain at high speeds, posing significant risk of injury to the rider. A limited understanding of these risks impedes both medical management as well as industry-appropriate protective equipment development. The objective of this study was to describe the frequency and type of injuries sustained by downhill mountain bikers utilizing such lift-accessed bike parks.

Methods.—A retrospective chart review was performed at one resort's urgent care facility for all patients seeking medical treatment for injuries sustained while riding in the neighboring mountain bike park during the 2009 season.

Results.—Of 898 identified cases, 86% (772) were male and the median age was 26 years (range 7–66). Of these patients, 19.4% (174) required transport off the mountain by the park's bike patrol while another 8.4% (75) arrived by emergency medical services. There were 1759 specific injury diagnoses identified, including 420 fractures in 382 patients (42.5%). Upper extremity fractures included 109 wrists, 122 shoulders, 37 elbows, and 49 hands/fingers. There were 31 lower extremity fractures and 19 spine fractures (one with paralysis). In addition, 27 patients were suspected to have internal abdominal trauma and 11.2% (101) had a concussion or more severe intracranial injury. Though 90.5% (813) of patients were discharged, 8.5% (76) required transfer to a higher level of care facility.

Conclusions.—Mountain bikers riding at this resort incurred a considerable number of injuries with significant morbidity during the 2009 riding season. Though exposure information was unavailable, these findings demonstrate the serious risks associated with this sport and highlight the need for continued research into appropriate safety equipment and risk avoidance measures.

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Impact of Social, Political, and Cultural Factors on Care of an Unresponsive Patient during the December Riots in Port-au-Prince, Haiti

A 30-year-old unresponsive woman was cared for by a volunteer team of US medical professionals at the Partners in Development Clinic in Port-au-Prince, Haiti, during the December riots. Previously, she had been evaluated at the clinic for vomiting and had been given granisetron after lab results showed a normal urinalysis and blood glucose level and a negative pregnancy test. The day she re-presented, her family called the clinic because the patient lost consciousness and had a possible seizure after arguing with her husband. A medical team dispatched to the patient's tent village found that she had stable vital signs, reactive pupils, no signs of trauma, and a blood glucose level of 120 mg/dL; however, she was unresponsive to painful stimuli. Once at the clinic, she underwent a more complete evaluation, including a negative malaria test. At this point, the clinic's limited resources were exhausted but, due to armed rioters, the patient could not be transported to a local hospital. After the patient remained unchanged during the night, her husband visited a voodoo priest who cast a spell to aid the patient. One hour later, the patient awoke, interacted normally with her family, and left the clinic ambulatory.

A combination of factors impacted patient care. First, the clinic had limited resources and intermittent electricity. Secondly, rioting restricted transportation and supplies, and it increased stress in this already traumatized population. Furthermore, illnesses were compounded by underlying malnutrition, anemia, and poor living conditions. Finally, team members were providing care in an unaccustomed medical and cultural environment.

Medical care is not provided in isolation; rather, multiple factors impact the patient and should be taken into account during treatment. Skill sets developed in more ideal settings can be translated into a valuable foundation for providing care in suboptimal circumstances; however, maintaining a cultural awareness and openness is critical.

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Morbidity and Mortality in US National Parks: A Review of National Emergency Medical Services Workload from 2007 to 2009

Objective.—Outdoor recreation is growing in the United States with over 278 million annual visitors to areas controlled by the National Park Service (NPS). The National Park rangers oversee emergency medical needs in these parks. This study exam-

ines medical and traumatic emergencies throughout the National Parks over a 3-year period to better understand events rangers encounter, types of fatalities, and automated external defibrillator (AED) usage on a national scale.

Methods.—This is a retrospective study of the Annual Emergency Medical Services Reports published by all 7 NPS regions from 2007 to 2009. At a regional and national level, the following were examined: traumatic vs medical vs first aid events, advanced life support vs basic life support, traumatic vs medical fatalities, cardiac events and outcomes, cardiac fatalities, and use of AEDs and outcomes.

Results.—The national incidence of EMS events was 50 events per million visitors. Medical, traumatic, and first aid events composed 28%, 27%, and 46% of reports, respectively. Two percent of medical episodes were cardiac, of which 57% received AED treatment. Thirty-three percent of cardiac arrests survived to hospital release. Sixty-three percent of fatalities were traumatic in nature, while the remaining 37% were non-traumatic in nature. Regional differences were found for all variables.

Conclusions.—To our knowledge, this is the first study to examine medical emergencies in the NPS on a national scale. There are equal numbers of medical and traumatic events. Automated external defibrillator use may be limited by access to AEDs. The number of cardiac arrests surviving to hospital discharge is higher than the national average. Regional variations in events probably reflect differences in terrain, common activities, and access to definitive care between regions. This data can assist the NPS in targeting the regions with the greatest number of incidents and fatalities for visitor prevention and education.

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Ocular Myiasis During an Amphibious Military Exercise in Djibouti

In November 2010, a healthy 27-year-old active duty US marine presented to the Battalion Landing Team 3/8 Battalion Aid Station located, at the time, on a beach in the East African nation of Djibouti. His chief complaint was of a foreign body sensation in the right eye, reporting that a bug had flown into the eye 8 hours prior. He denied further symptoms. Physical exam revealed multiple 1 to 2 mm larvae moving vigorously on the conjunctiva of the affected eye, confirming the diagnosis of ocular myiasis. The patient's eye and its maggots were anesthetized with 0.5% tetracaine ophthalmic drops, and a total of 15 maggots were collected manually using cotton-tipped applicators. Antibacterial prophylaxis was given with topical moxifloxacin drops and erythromycin ointment. Slit lamp and fluorescein exams were normal after the procedure. Treatment was stopped after 3 days and the patient had no complications.

In March 2011, the entomology team at Camp Leatherneck, Afghanistan, examined the specimens and determined they

were most likely the lively, hook-mouthed maggots of the viviparous sheep nasal bot, a fly endemic to most of the Middle East and northern Africa. The presentation was similar to several others described in the literature, though no baseline incidence or other cases have been reported from Djibouti. The environment for the field exercise was a secluded beachfront inhabited sparsely by migrant goat herders with an estimated livestock-to-human ratio of 20:1. The rapid insertion of a 300-man reinforced US Marine Corps rifle company likely changed the behavior of the herds and tenders, but also drastically altered the balance of hosts available to the average gravid bot. The result was a counterintuitive but foreseeable urban microcosm formed in an otherwise desolate rural area. In such a situation, clinicians may reasonably expect the risk for human infestation by zoonotic parasites to well exceed the local baseline risk.

The views expressed in this article are those of the authors and do not necessarily reflect the official policy or position of the Department of the Navy, Department of Defense, or the US Government.

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Acute Anxiety Among Marines After Recent Arrival at High Altitude: High Altitude Anxiety as a Distinct Diagnostic Entity

Background.—As United States and allied armed forces maintain a presence in high altitude regions such as eastern Afghanistan, a better understanding of the prevention, diagnosis, and treatment of altitude illness has become increasingly important. This preventable form of disease/nonbattle injury presents a significant issue to readiness for warfighter performance in the field.

Objective and Results.—At the Marine Corps Mountain Warfare Training Center in Bridgeport, California (operational altitudes: 2061 to 3383 m), 1036 unacclimatized Marines participated in battalion-level mountain warfare exercises in July 2010. Several unexpected, clear-cut cases of severe anxiety were observed at the Battalion Aid Station (BAS), located at 2061 m, over the first 6 days after training proceeded above 2000 m. These cases occurred among otherwise healthy Marines, some having had no prior history of psychiatric illness, and others having had a history of well-controlled panic disorders or combat stress-related psychiatric illness. All patients presented with similar symptoms of mild to moderate tachycardia, tachypnea, and diaphoresis; some presented with extremity numbness and tingling. Acute cardiopulmonary events could not be decisively ruled out by electrocardiogram, chest radiograph, or lab studies (given the equipment limitation of the BAS); however, patients were monitored clinically with vital signs, pulse oximetry, and chest auscultation/palpation. All patients responded clinically to oxygen, rest, and benzodiaz-