

post-mission analysis confirmed a low yield from the military surgical resource. The experience of the team suggests that non-surgical medical, transportation, and logistical resources filled essential gaps in health assessment, evacuation, and essential primary care in an otherwise resource poor surge response capability. Due to an absence of outcomes data, the true effect of the mission on population health remains unknown. Militaries should focus their disaster response efforts on employment of logistics, primary medical care, and transportation/evacuation. Future response strategies should be evidence-based and incorporate a means of quantifying outcomes.

Keywords: civil-military; deployment; disaster; earthquake; military-specific; mobile surgical team; natural disaster; Peru

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First Use of the Canada-US Civil Assistance Plan—Hurricane Gustav, August 2008: A Bi-National Success Story

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Introduction: In February 2008, the Canada-US Civil Assistance Plan (CAP) was signed. The agreement facilitates the armed forces from one nation to support the armed forces of the other nation during a civil emergency.

Methods: The first opportunity to carry out the plan occurred six months later, in August 2008, when Hurricane Gustav was bearing down on the coast of Louisiana. The US Northern Command received an assignment to aeromedically evacuate up to 1,000 patients who were in hospitals and nursing homes in the forecasted path of the hurricane. Given the short lead-time, this task required a significant concentration of resources in order to be successful. Accordingly, the Commander of the US Northern Command initiated a request for assistance from Canada, using the CAP.

Results: After receiving approval from both governments, the Canadian Forces quickly deployed a CC-177 Globemaster III aircraft to Lakefront, Louisiana. The time from official diplomatic request to evacuation and mission completed was <24 hours.

Conclusions: This first use of the new CAP was considered to be an overwhelming success. It was seen to uphold the long-standing tradition of cooperation and mutual support in times of crisis that has existed between Canada and the US.

Not only was the operation a huge success, it was accomplished in a remarkably short period of time. The CAP has proven to be an excellent mechanism to facilitate the provision of support in times of need between these two close neighbors.

Keywords: aeromedical evacuation; Canada-US Civil Assistance Plan; civil-military; disaster; Hurricane Gustav

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The Army Health System: One Face of the Same Coin

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Objective: The objective of this study was to determine the impact of the Army Health System in public health, through the medical support provided in the Critical Care Unit of the Central Military Hospital and the Hospital in Rio Gallegos.

Methods: A prospective trial of 594 adult patients was performed; 295 were admitted to the intensive care unit (ICU) of HMC and 254 were admitted to the ICU at HRRG1. For each patient, age, diagnosis, severity using the Apache II score, daily treatment required using the Therapeutic Intervention Scoring System (TISS 28) score, length of mechanical ventilation, length of stay in the ICU, daily cost of medication, and outcome were recorded. All data were tested using the chi-square statistical test, and a *p*-value less than 0.05 was considered to be statistically significant.

Results: The mean age was 60 (SD = 18), the mean TISS 28 score was 17 (SD = 8), the mean length of stay in the ICU was 4.5 days (SD = 5) for those in the HMC, and five days (SD = 5) in the HRRG. The mean daily cost of stay among the patients in the HMC was \$855 (SD = 120), and \$955 (SD=397) in the HRR. The mean time of invasive mechanical ventilation (IMV) of patients in HMC was 1.5 days (SD = 3), and 2.6 (SD = 4) in the HRRG. The mortality rate of the traumatic patients with an Apache II score >16 was 13% at HMC, but 37% at HRRG. The prevalence of cost a of stay >\$900 for patients with a TISS score >17 and IMV >3 days was 17% at HMC, but 47% at HRRG.

Conclusions: The mortality rate and cost are higher among those patient admitted in ICU with higher Apache II and TISS 28 scores, requiring invasive mechanical ventilation. The Army Health System provides a reduction in cost and good support to civilian public health

Keywords: Argentina; civil-military; cost; intensive care unit; ventilation

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How to Build a Mobile Field Hospital in Disasters: An Italian Model

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Introduction: During a disaster, local health services can be overwhelmed, and damage to clinics and hospitals can render them useless. Damage to the healthcare infrastructure further compromises the delivery of health services. Many countries maintain mobile field hospitals in order to respond in case of a possible disaster. In this new context and concept of disaster medicine, a mobile field hospital plays a significant response role.

Methods: The authors describe an Italian model of mobile field hospital of the Italian Association of Alpini (ANA). It is a mobile, flexible hospital that is self-contained, self-sufficient, capable deploying rapidly, and expanding or con-

tracting during a disaster or to provide humanitarian medical assistance. The mobile field hospital supports the activities of civil protection in national and international contexts, implements local emergency medical services, and supports hospitals in bed surge capacity and treatment of mass-casualties for a specific period of time.

Results: The Field Hospital of Alpines, created in 1976, has operated in Italy and in different international contexts.

Conclusions: During complex disasters (civil conflicts, wars), field hospitals (civilian or military) have been used successfully and have a crucial role in supporting the health care of the affected population.

Keywords: civil-military collaboration; disasters, foreign field hospitals; hospital preparedness; international cooperation

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Using Military Resources to Sustain Government Hospitals during Labor Unrest: The South African Experience

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Introduction: In 2006, a work strike by certain groups of healthcare professionals in government hospitals in South Africa completely paralyzed 84 large public hospitals for nearly one month. All hospital nursing and support personnel were absent and intimidation by strikers prevented staff from entering the hospital premises. More than 6,000 hospital beds were without caregivers. Military resources, including military medical personnel, were deployed to sustain essential health services.

Methods: This presentation will provide a retrospective overview of the experience gained during this operation in which nearly 1,000 military personnel were rotated daily to staff 84 hospitals throughout the country. Due to the large numbers of personnel required, unskilled and partially skilled personnel also were utilized after emergency training, to maintain advanced services.

Services required included nursing care, cleaning services, emergency care, laundry services, and logistical supply distribution.

Guidelines will be given on how to prepare and re-organize a large hospital for a total absence of nursing and support staff, as well as lessons learned in providing military personnel to sustain service delivery for an extensive period of time.

Results: Through the use of military resources, it was possible to sustain care of civilian patients in government hospitals for a period of nearly a month.

Conclusions: Military medical resources are a valuable, organized, and disciplined asset that can be used to sustain civilian facilities during crisis situations.

Keywords: civil-military cooperation; health care; hospital strike action; labor strike; South Africa

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Frozen -80°C Red Cells, Plasma, and Platelets in Combat Casualty Care

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Introduction: Since 2004, the Netherlands military mainly has used -80°C frozen blood products for their medical treatment facilities since 2004. This report describes the experience with these products during the past two years in Afghanistan.

Methods: All -80°C frozen red cells, plasma, and platelets are produced and stored in the Netherlands. Units are shipped at -80°C (dry ice), stored in the theatre at -80°C (mechanical freezer), and thawed on demand (all products) or stored subsequently at 4°C (red cells). Data from August 2006–2008 were collected from the Netherlands' peripheral blood banks in support of (inter)national medical treatment facilities in South Afghanistan.

Results: During the past two years, 397 patients (85% Afghan) were transfused with 469 4°C liquid stored red cells and 2,345 -80°C frozen blood products (941 red cells, 1,023 plasma, and 381 platelets). Approximately 10% of the frozen red cells and 100% of the platelets and plasma transfused, were prepared on demand. The data showed that most (>90%) of the transfused patients were trauma victims, of which approximately 10% required more than 10 red cell units within 24 hours. No shortages or transfusion reactions were reported.

Conclusions: A -80°C frozen inventory of the most essential blood components readily available after thawing (and washing) allows for safely reducing shipments and abandoning the backup "walking blood bank" without compromising the availability of blood products in theatre. Fully tested, frozen blood products, shipped, stored, and readily available on location after thaw, proved to be an effective and safe blood support for combat casualty care.

Keywords: blood bank; capacity building; combat; frozen; inventory; preparedness; transfusion

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Poster Presentations—Civil-Military Collaboration

(L1) Developing an Integrated Civilian-Military Model for Healthcare Emergency Response Planning

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Introduction: Developing an integrated civilian-military (CIV/MIL) model for healthcare emergency response planning will support collaborative and synchronized medical responses in domestic disasters. Identifying opportunities for such integration through an initial strategic assessment and then, by developing, piloting, implementing, exercising, evaluating, and disseminating programs and services that meet the documented needs of civilian and military partners is