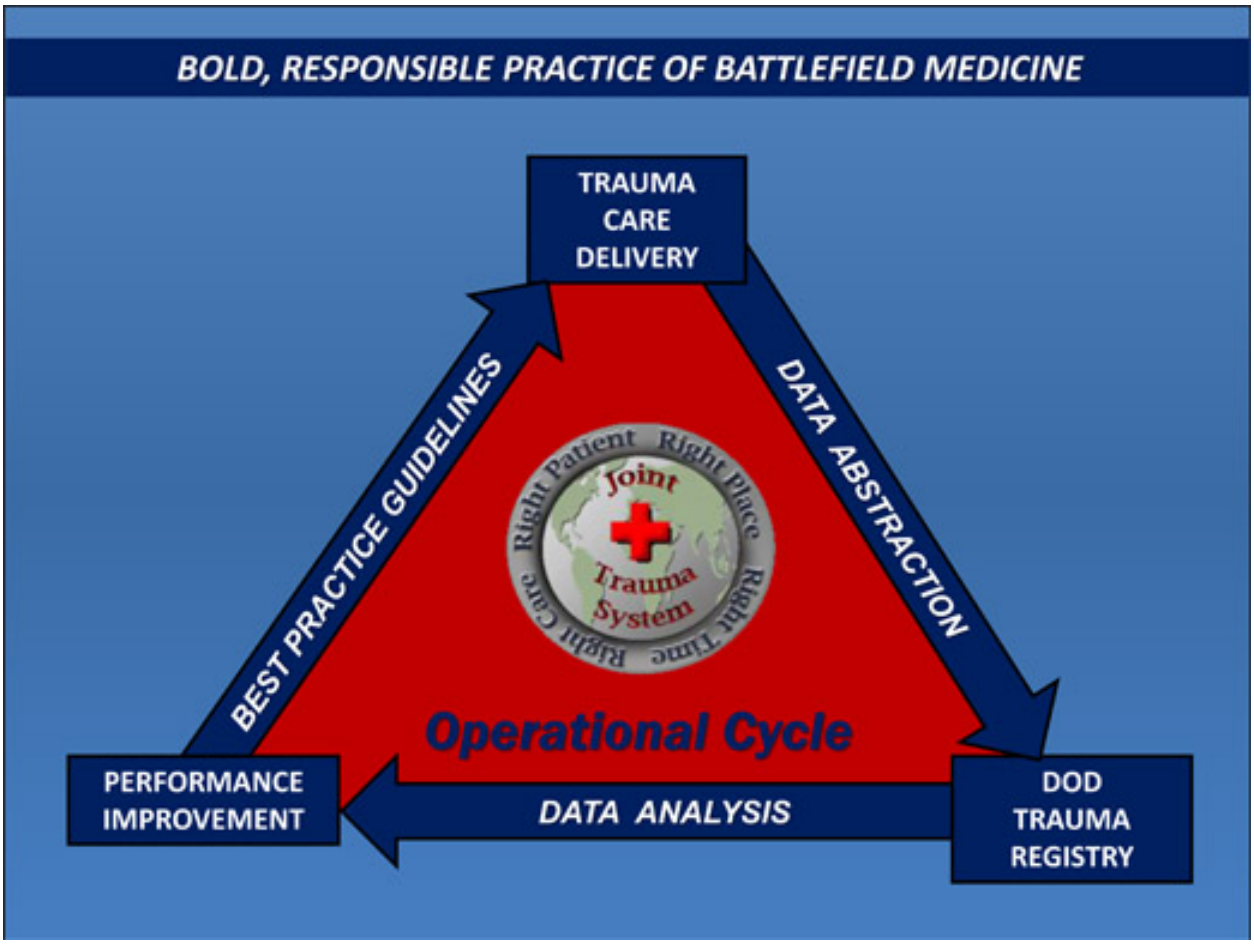
Committee on En Route Combat Casualty Care (CoERCCC)



Journal Watch

4th Quarter

2018

Journal Watch Key Terminology Searched:

Emergency medical services
Acute coronary syndrome
Emergency care
Aeromedical evacuation
Traumatic brain injury
Substances for disinfection
Standardized operating procedures
Forward MEDEVAC
Trauma
Helicopter
Transportation Vibration
Spinal cord injury
Physically demanding occupation
CASEVAC
Tactical evacuation
High Altitude
Resuscitation
Myocardial infarction
Telemedicine
Inflammation
Air traffic
Highly infectious diseases
Combat
Joint trauma system
MRAP
Porcine model
Airway management
ST-segment elevation
Task analysis
Ground Evacuation
Inter-facility Transport
Casualty Evacuation
Treatment efficacy
Pre-hospital
Hypobaria
Neuronal cell death
Disinfection of aircraft
Stabilization
FLYP
PECC
SCI
Shock
Guideline
Employment standards
Vibration
Battlefield Evacuation
Drones

J Trauma Acute Care Surg. 2018 Jul 5. doi: 10.1097/TA.0000000000002014. [Epub ahead of print]

HYPOBARIA DURING LONG RANGE FLIGHT RESULTED IN SIGNIFICANTLY INCREASED HISTOPATHOLOGICAL EVIDENCE OF LUNG AND BRAIN DAMAGE IN A SWINE MODEL.

Scultetus AH[1,2], Jefferson MA[3], Haque A[1], Ho LTVT[1], Hazzard B[1], Saha BK[1], Chun SJ[1,4], Auker CR[1], Moon-Massat PF[1], McCarron RM[1,2], Malone DL[1,2,4].

Abstract

BACKGROUND: Aeromedical evacuation to definitive care is standard in current military conflicts. However, there is minimal knowledge on the effects of hypobaria on either the flight crew or patients. The effects of hypobaria was investigated using healthy swine.

METHODS: Anesthetized Yorkshire swine underwent a simulated 4 h "transport" to an altitude of 2,441 m (8,000 ft.; HYPO, N = 6) or at normobaric conditions (NORMO, N = 6). Physiological and biochemical data were collected. Organ damage was assessed for hemorrhage, inflammation, edema, necrosis and, for lungs only, microatelectasis.

RESULTS: All parameters were similar prior to and after "transport" with no significant effects of hypobaria on hemodynamic, neurologic, or oxygen transport parameters, nor on blood gas, chemistry, or complete blood count data. However, the overall Lung Injury Score was significantly worse in the HYPO than the NORMO group (10.78 ±1.22 vs. 2.31 ± 0.71, respectively) with more edema/fibrin/hemorrhage in the subpleural, interlobular and alveolar space, more congestion in alveolar septa, and evidence of microatelectasis (vs. no microatelectasis in the NORMO group). There was also increased severity of pulmonary neutrophilic (1.69 ±0.20 vs. 0.19 ±0.13) and histiocytic inflammation (1.83 ±0.23 vs. 0.47 ±0.17) for HYPO vs. NORMO, respectively. On the other hand, there was increased renal inflammation in NORMO compared to HYPO (1.00 ±0.13 vs. 0.33 ±0.17, respectively). There were no histopathological differences in brain (whole or individual regions), liver, pancreas or adrenals.

CONCLUSION: Hypobaria, itself, may have an adverse effect on the respiratory system, even in healthy individuals and this may be superimposed on combat casualties where there may be pre-existing lung injury. The additional effects of anesthesia and controlled ventilation on these results are unknown and further studies are indicated using awake models to better characterize the mechanisms for this pathology and the factors that influence its severity.Level II, Therapeutic/Care Management.

PMID: 29985235 DOI: 10.1097/TA.0000000000002014

J Spec Oper Med. Summer 2018;18(2):79-85.

Survey of Casualty Evacuation Missions Conducted by the 160th Special Operations Aviation Regiment During the Afghanistan Conflict.

Redman TT, Mayberry KE, Mora AG, Benedict BA, Ross EM, Mapp JG, Kotwal RS.

Abstract

BACKGROUND: Historically, documentation of prehospital combat casualty care has been relatively nonexistent. Without documentation, performance improvement of prehospital care and evacuation through data collection, consolidation, and scientific analyses cannot be adequately accomplished. During recent conflicts, prehospital documentation has received increased attention for point-of-injury care as well as for care provided en route on medical evacuation platforms. However, documentation on casualty evacuation (CASEVAC) platforms is still lacking. Thus, a CASEVAC dataset was developed and maintained by the 160th Special Operations Aviation Regiment (SOAR), a nonmedical, rotary-wing aviation unit, to evaluate and review CASEVAC missions conducted by their organization.

METHODS: A retrospective review and descriptive analysis were performed on data from all documented CASEVAC missions conducted in Afghanistan by the 160th SOAR from January 2008 to May 2015. Documentation of care was originally performed in a narrative after-action review (AAR) format. Unclassified, nonpersonally identifiable data were extracted and transferred from these AARs into a database for detailed analysis. Data points included demographics, flight time, provider number and type, injury and outcome details, and medical interventions provided by ground forces and CASEVAC personnel.

RESULTS: There were 227 patients transported during 129 CASEVAC missions conducted by the 160th SOAR. Three patients had unavailable data, four had unknown injuries or illnesses, and eight were military working dogs. Remaining were 207 trauma casualties (96%) and five medical patients (2%). The mean and median times of flight from the injury scene to hospital arrival were less than 20 minutes. Of trauma casualties, most were male US and coalition forces (n = 178; 86%). From this population, injuries to the extremities (n = 139; 67%) were seen most commonly. The primary mechanisms of injury were gunshot wound (n = 89; 43%) and blast injury (n = 82; 40%). The survival rate was 85% (n = 176) for those who incurred trauma. Of those who did not survive, most died before reaching surgical care (26 of 31; 84%).

CONCLUSION: Performance improvement efforts directed toward prehospital combat casualty care can ameliorate survival on the battlefield. Because documentation of care is essential for conducting performance improvement, medical and nonmedical units must dedicate time and efforts accordingly. Capturing and analyzing data from combat missions can help refine tactics, techniques, and procedures and more accurately define wartime personnel, training, and equipment requirements. This study is an example of how performance improvement can be initiated by a nonmedical unit conducting CASEVAC missions.

2018 PMID: 29889961

J Trauma Acute Care Surg. 2018 Jul;85(1S Suppl 2):S112-S121. doi: 10.1097/TA.0000000000001798.

The effect of prehospital transport time, injury severity, and blood transfusion on survival of US military casualties in Iraq.

Kotwal RS[1], Scott LLF, Janak JC, Tarpey BW, Howard JT, Mazuchowski EL, Butler FK, Shackelford SA, Gurney JM, Stockinger ZT.

Author information

Abstract

BACKGROUND: Reducing time from injury to care can optimize trauma patient outcomes. A previous study of prehospital transport of US military casualties during the Afghanistan conflict demonstrated the importance of time and treatment capability for combat casualty survival.

METHODS: A retrospective descriptive analysis was conducted to analyze battlefield data collected on US military combat casualties during the Iraq conflict from March 19, 2003, to August 31, 2010. All casualties were analyzed by mortality outcome (killed in action, died of wounds, case fatality rate) and compared with Afghanistan conflict. Detailed data for those who underwent prehospital transport were analyzed for effects of transport time, injury severity, and blood transfusion on survival.

RESULTS: For the total population, percent killed in action (16.6% vs. 11.1%), percent died of wounds (5.9% vs. 4.3%), and case fatality rate (10.0 vs. 8.6) were higher for Iraq versus Afghanistan ($p < 0.001$). Among 1,692 casualties (mean New Injury Severity Score, 22.5; mortality, 17.6%) with detailed data, the injury mechanism included 77.7% from explosions and 22.1% from gunshot wounds. For prehospital transport, 67.6% of casualties were transported within 60 minutes, and 32.4% of casualties were transported in greater than 60 minutes. Although 97.0% of deaths occurred in critical casualties (New Injury Severity Score, 25-75), 52.7% of critical casualties survived. Critical casualties were transported more rapidly ($p < 0.01$) and more frequently within 60 minutes ($p < 0.01$) than other casualties. Critical casualties had lower mortality when blood was received ($p < 0.01$). Among critical casualties, blood transfusion was associated with survival irrespective of transport time within or greater than 60 minutes ($p < 0.01$).

CONCLUSION: Although data were limited, early blood transfusion was associated with battlefield survival in Iraq as it was in Afghanistan.

LEVEL OF EVIDENCE:

Performance improvement and epidemiological, level IV.

PMID: 29334570 DOI: 10.1097/TA.0000000000001798

J Burn Care Res. 2018 Jun 13;39(4):593-597. doi: 10.1093/jbcr/irx026.

The Use of a Silver-Nylon Dressing During Evacuation of Military Burn Casualties.

Aurora A[1], Beasy A[1], Rizzo JA[1,2], Chung KK[2,3].

Abstract

The military has used silver-nylon dressings as a topical antimicrobial on combat-related burns for the past 15 years. However, their clinical efficacy and associated risks have not been evaluated. Herein, the authors document our experience with the use of a specific silver-nylon dressing (Silverlon®) during global evacuation of casualties from combat zones to the United States sArmy Institute of Surgical Research Burn Center. A 10-year retrospective analysis was performed. Variables included patient demographics, total body surface area, length of stay, Injury Severity Score, incidence of urinary tract and burn infections, pneumonia, patient status at the time of discharge, and a composite endpoint. The patient cohort was stratified into two groups: Silverlon® (Group 1) and topical antimicrobial agents (Group 2). Data were analyzed using appropriate statistical tests ($P \leq .05$). Nine hundred eighty-eight patients (26 ± 6 years) were identified with 184 patients (Group 1) and 804 patients (Group 2). Silver-nylon dressings trended toward decreased wound infection rate (5.4 vs 9.5%) even when applied to full-thickness burn injuries. When compared with topical antimicrobial agents, the silver-nylon dressing was not associated with significant differences in burn-related complication. The authors demonstrate the antimicrobial efficacy of the silver-nylon dressing during global evacuation of burn casualties from combat zones to the burn center. Compared with topical antimicrobials, the silver-nylon dressing is lightweight and easy to apply and requires minimal wound management which makes it desirable as a burn dressing for combat applications as well as mass casualty situations.

PMID: 29901799 DOI:10.1093/jbcr/irx026

Mil Med. 2018 Aug 14. doi: 10.1093/milmed/usy188. [Epub ahead of print]

Psychiatric Aeromedical Evacuations of Deployed Active Duty U.S. Military Personnel During Operations Enduring Freedom, Iraqi Freedom, and New Dawn.

Peterson AL[1,2,3], Hale WJ[1,3], Baker MT[4], Cigrang JA[5], Moore BA[1,3], Straud CL[1], Dukes SF[6], Young-McCaughan S[1], Gardner CL[4], Arant-Daigle D[4], Pugh MJ[1,2], Williams Christians I[1], Mintz J[1];

Abstract

Introduction: The primary objective of this study was to describe the demographic, clinical, and attrition characteristics of active duty U.S. military service members who were aeromedically evacuated from Iraq and Afghanistan theaters with a psychiatric condition as the primary diagnosis. The study links the U.S. Transportation Command Regulating and Command and Control Evacuation System (TRAC2ES) data with the Defense Manpower Data Center (DMDC) to conduct an examination of the long-term occupational impact of psychiatric aeromedical evacuations on military separations and discharges.

Materials and Methods: Retrospective analyses were conducted on the demographic, clinical, and attrition information of active duty service members (N = 7,023) who received a psychiatric aeromedical evacuation from Iraq or Afghanistan between 2001 and 2013 using TRAC2ES data. Additionally, TRAC2ES database was compared with DMDC data to analyze personal and service demographics, aeromedical evacuation information, and reasons for military separation with the entire 2013 active duty force. Chi-square tests of independence and standardized residuals were used to identify cells with observed frequencies or proportions significantly different than expected by chance. Additionally, OR were calculated to provide context about the nature of any significant relationships.

Results: Compared with the active duty comparison sample, those with a psychiatric aeromedical evacuation tended to be younger, female, white, divorced or widowed, and less educated. They were also more likely to be junior enlisted service members in the Army serving in a Combat Arms military occupational specialty. The primary psychiatric conditions related to the aeromedical evacuation were depressive disorders (25%), adjustment disorders (18%), post-traumatic stress disorder (9%), bipolar disorders (6%), and anxiety disorders (6%). Approximately, 3% were evacuated for suicidal ideation and associated behaviors. Individuals who received a psychiatric aeromedical evacuation were almost four times as likely (53%) to have been subsequently separated from active duty at the time of the data analysis compared with other active duty service members (14%). The current study also found that peaks in the number of aeromedical evacuations coincided with significant combat operational events. These peaks almost always preceded or followed a significant operational event. An unexpected finding of the present study was that movement classification code was not predictive of subsequent reasons for separation from the military. Thus, the degree of clinical supervision and restraint of a service member during psychiatric aeromedical evacuation from deployment proved to be unrelated to subsequent service outcome.

Conclusions: Psychiatric conditions are one of the leading reasons for the aeromedical evacuation of active duty military personnel from the military combat theater. For many active duty military personnel, a psychiatric aeromedical evacuation from a combat theater is the start of a military career-ending event that results in separation from active duty. This finding has important clinical and operational implications for the evaluation and treatment of psychiatric conditions during military deployments. Whenever possible, deployed military behavioral health providers should attempt to treat psychiatric patients in theater to help them remain in theater to complete their operational deployments. Improved understanding of the factors related to psychiatric aeromedical evacuations will provide important clinical and policy implications for future conflicts.

PMID: 30124915 DOI: 10.1093/milmed/usy188

J Spec Oper Med. Spring 2018;18(1):19-22.

Benefit of Critical Care Flight Paramedic-Trained Search and Rescue Corpsmen in Treatment of Severely Injured Aviators.

Snow RW, Papalski W, Siedler J, Drew B, Walrath B.

Abstract

During routine aircraft start-up procedures at a US Naval Air Station, an aviation mishap occurred, resulting in the pilot suffering a traumatic brain injury and the copilot acquiring bilateral hemopneumothoraces, a ruptured diaphragm, and hepatic and splenic contusions. The care of both patients, including at point of injury and en route to the closest trauma center, is presented. This case demonstrates a benefit from advanced life-saving interventions and critical care skills beyond the required scope of practice of search and rescue medical technicians as dictated by relevant instructions.

PMID: 29533427