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Book Reviews: Technical Books Section

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FEATURED BOOK

ILLUMINATING READING

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Rating : 6.0
★★★★★★★ (7/5)

Combat medicine - Basic and Clinical Research in Military, Trauma, and Emergency Medicine, 1st Edition, *Edited by* George C. Tsokos and James L. Atkins. Hardcover 6" x 9".
Humana Press Inc., 999 Riverview Drive, Suite 208, Totowa, New Jersey 07512; Publication Date July, 2003. xii + 426 pages, ISBN 1-58829-070-0 (acid-free Paper). E-ISBN 1-59259-407-7. Price $125.00

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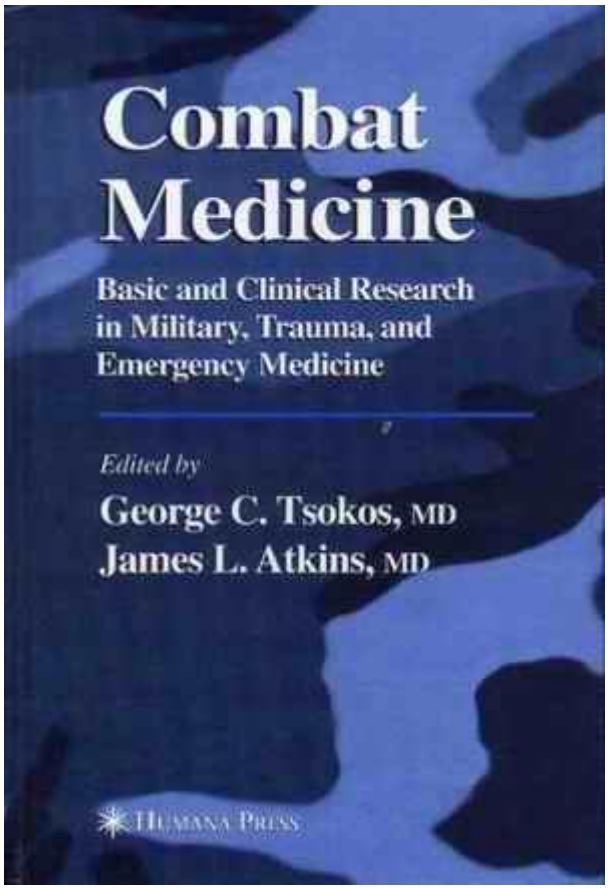

The ever-changing theatre of war has constantly required the development of modern methods in combat medicine. Any possible scenario requires careful planning for, together with the use of set protocol for appropriate treatment regimes. For example, combat could result in blunt force trauma, incised wounds, projectile injuries (both primary and secondary), blast-related injuries, hypovolaemic insults, chemical insults, burns or exposure to nuclear or biological agents. Even the setting for the combat may produce increased risks for those fighting within the region; persons fighting within the Persian Gulf theatre have an increased risk of heat-stress related illnesses.

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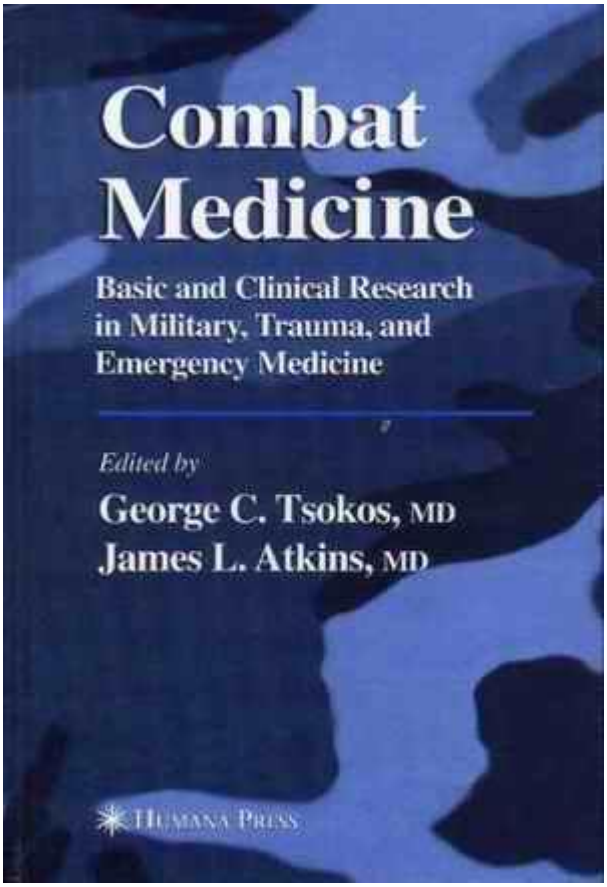
The golden hour in which to stabilise an injured soldier remains fundamental to treatment. Improved means of evacuation to nearby hospital bases, or hospital ships, has ensured that many wounded receive surgical treatment and resuscitation within six hours of injury infliction, as was documented during the 1980's Falkland Island conflict, though the difficult terrain and weather often hampered this. Despite the increased trend towards "remote control warfare" from a distant battle centre, the need for a ground force to secure areas continues. This, as amply demonstrated by recent conflicts, can result in the continued occurrence of casualties despite the apparent end of hostilities. The incidents of 1993 depicted in "Black Hawk Down", during which attack helicopters were attacked in Somali, has also resulted in changes to the treatment protocols of injured soldiers. Training scenarios now incorporate the effects of hostile gunfire and continued attacks whilst trying to assist and treat injured parties. Individuals are instructed to retaliate with gunfire to allow treatment to continue and ensure the ultimate evacuation. However, rotary wing evacuation itself poses potential risks; the altitude at which helicopter safely travel may worsen a pneumothorax, a common complication of thoracic injuries in both civilian and combatant injured alike.



A book's philosophy is often reflected best in its preface, where the authors/editors try to explain what made them write the book, and what were their main considerations while deciding to include/exclude topics. It has been this journal's endeavor since its inception to present the reviews of books in conjunction with their preface. Here are some extracts from the preface of *Combat Medicine*

Trauma and exposure to toxic and infectious agents invariably lead to organ damage followed by significant morbidity and mortality. Although these conditions have typically been associated with the battlefield, today they are more prevalent in urban areas. The events of September 11, 2001 have brought this problem to the forefront of national and international concern. The demand for solutions is justifiably high, and the research community needs to adjust its efforts appropriately.

Combat Medicine is meant to be a concise manual for the young clinical or basic investigator who is studying organ injury following trauma or toxic or infectious assaults either in an urban or battlefield setting, with an emphasis on current research issues in emergency and military medicine. The aim of Combat Medicine is to inspire surgical and medical residents and fellows, as well as biology and biochemistry students and fellows, to pursue research careers in the fields of military, trauma, and emergency medicine. Combat Medicine is not intended to be an exhaustive review; rather it is an introduction to key principles of this field.

The area of combat medicine research is enormously diverse, and in many ways it has not yet been defined. Mechanisms that lead to tissue damage include apoptosis, abnormalities in nitric oxide production, and disturbance of cell biochemistry. The affected organs are equally diverse and include the skin, the lungs, and the nervous system. Accordingly, we elected to divide the book into two parts. In the first, we asked experts to discuss the basic mechanisms that are invariably

involved in the development of organ injury, such as apoptosis, nitric oxide production regulation, complement activation, and immune cell response to stressors. For the second part, we asked colleagues to discuss the current concepts that govern research aimed at understanding and reversing damage to major organs.

The authors explore mechanisms involved in the development of injury, review animal and, when available, human studies, and focus attention on future directions for research.

-George C. Tsokos, MD
James L. Atkins, MD

The rapid use of surgical debridement, together with the development and application of prophylactic broad-spectrum antibiotics has resulted in fewer deaths from wounds over the decades. Whereas Clostridium spp. posed a great risk during the First World War, causing the death of up to 17% of those killed during the war and resulting in 90% of gas gangrene cases, cases in warfare have decreased subsequently, though knowledge of the environment in which the battles occurs may reveal increased risks; during the summer months, human excrement was often applied to the agricultural fields of Korea as a fertiliser. Thus the risk of Clostridium wound infections during combat within such areas was abnormally increased.

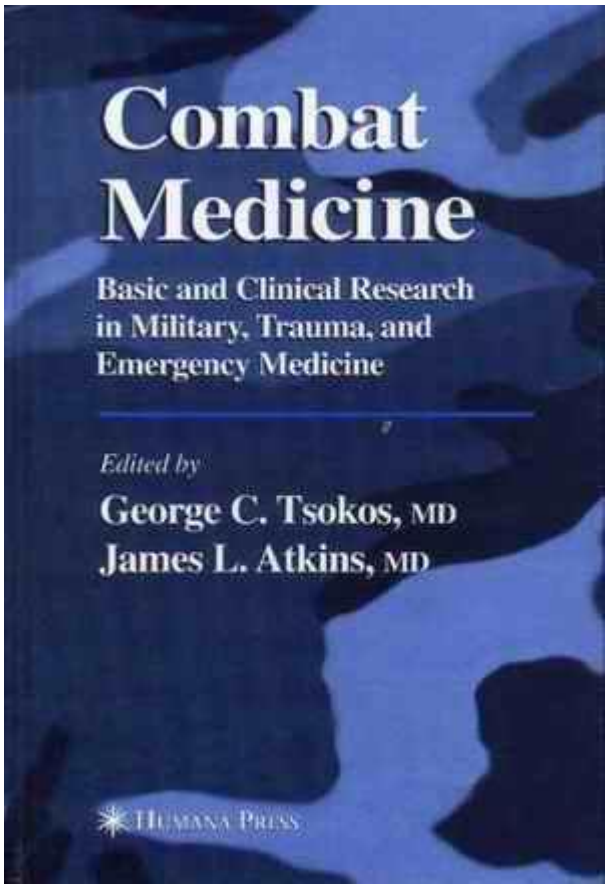
"Combat Medicine", a textbook of articles edited by Tsokos and Atkins, aims to bring together all aspects of the pathophysiology of warfare together with information regarding accepted treatment protocols. It details the history of infectious agents causing wound infections through the conflicts of the last three millennia, together with information regarding novel research and future treatments or diagnostic instruments. The potential for an extensive and authoritarian text upon the subject is great, with many workers within the medical profession prospective purchasers of such reading matter. Unfortunately, the emphasis with which it places its main focus appears obscure, resulting in a disappointing collection of papers.

The book, though admittedly subtitled as "Basic and Clinical Research in Military, Trauma and Emergency Medicine", focuses too much upon molecular and subcellular processes that are better covered in separate dedicated pathological texts. Notable aspects include the chapters devoted to the emerging understanding of apoptosis and nitric oxide, which, though related to trauma medicine peripherally, add little to the actual recognition and treatment of injuries or diseases in a clinical setting. With much to discuss, the inclusion of such material appears somewhat distracting.

The opportunity for describing novel techniques or diagnostic instruments is also lost within the text. Though some aspects are described well, such as the development of a portable microwave detector to assist in the diagnosis of perforated viscera or pneumothorax thus limiting the risks associated with helicopter evacuation, there remains little discussion of future technology. One interesting research aspect that is well described, however, is the potential for induced hypothermic suspended animation. Tested on porcine models through aortic injury based exsanguinations, the animals were rapidly cooled to temperatures below 10°C and the injury repaired under cardiopulmonary bypass with hyperkalaemic infusion solutions. The resultant recovery rate is interesting, together with the absence of any appreciable neurological disturbances; its potential application, not only to the field of combat medicine, is therefore vast.

Some aspects prove illuminating reading, such as the close association of the U.S. army with the development of red blood cell storage, created in an attempt to minimise waste and maximise

transportation to mobile army surgical hospitals, and the modern recommendations for the treatment of acute respiratory distress syndrome with the patient in a prone position. The drawing together of some research also enlightens the reader, including the realisation that it is not purely the concentration of carboxyhaemoglobin in smoke inhalation deaths that results in fatality; animals exsanguinated and perfused with carboxyhaemoglobin poisoned blood produced no adverse effects at concentrations of 64%.



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However, the text is disjointed and very sparsely illustrated, with only a few poorly reproduced black and white images (many of which the reader will find difficult identifying the abnormality upon) and only a small number of line diagrams to assist in understanding the information provided. Interestingly, the editors have decided to only include bioterrorism in the final 27 pages of the text. Though the history of bioterrorism is detailed, including the use of arrowheads coated in faeces or the projection of venomous snakes or plague-infected cadavers into military strongholds, the modern aspects and future possibilities of biological agents are only glossed over in low detail. Few clinical images are provided and no histological photographs are used, which could aid in the diagnosis of diseases by clinicians unsuspecting of such outbreaks.

Incredibly, given the modern political climate, no reference is made to the potential risks of radiological agents, including the so-called "dirty bomb" scenario. There is also no indication of decontamination issues in exposure to nuclear, biological or chemical warfare of patients and

health care professionals, despite the knowledge that many politically separate regimes possess such weapons. Though possibly not appropriate for this text, the application of all this knowledge within a protocol for the development of mass disaster planning for such scenario would have been a welcome addition for physicians involved in such events.

Overall the text fails to live up to its potential, with too little applicable information reproduced for use by those that may be exposed to the effects of terrorist warfare, which increasingly is being focused more upon a civilian population, and too much contents devoted instead to molecular matters dealt with better elsewhere.



-Benjamin Swift
Dr. Benjamin Swift is on the editorial board of Anil Aggrawal's Internet Journal of Forensic Medicine and Toxicology. Click image to have more information about him.

Review 1 by Jason Payne-James, UK

Review 2 by Benjamin Swift, UK

Review 3 by Dr. Puneet Setia of India and Dr. Avneesh Gupta of USA

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