

# We are IntechOpen, the world's leading publisher of Open Access books Built by scientists, for scientists

6,900

Open access books available

186,000

International authors and editors

200M

Downloads

Our authors are among the

154

Countries delivered to

TOP 1%

most cited scientists

12.2%

Contributors from top 500 universities



WEB OF SCIENCE™

Selection of our books indexed in the Book Citation Index  
in Web of Science™ Core Collection (BKCI)

Interested in publishing with us?  
Contact [book.department@intechopen.com](mailto:book.department@intechopen.com)

Numbers displayed above are based on latest data collected.  
For more information visit [www.intechopen.com](http://www.intechopen.com)



# Introductory Chapter: Military Medicine - Current Topics

*Nikolai V. Gorbunov*

## 1. Introduction

### 1.1 Military medicine at the 21st century – Mission and challenges

Military medicine in the 21st Century encompasses diverse medical and scientific knowledge, techniques and combat skills to serve national military forces by optimal care of their combatants in operations on land, sea and aerospace while acting in compliance with the National Defense Strategies and International Law [1–5].

In the US Forces this also incorporates efforts on promoting health and well-being within servicemen and servicewomen that is carried out by the force health protection system [6]. Thus, along with managing illnesses and providing robust combat casualty care toward restoration of physical and mental wellness, the US military healthcare has a major stand in maintaining the readiness of members of the armed services to their missions. This burden comprises prevention of disease, injury and advancement of training and management of stress and high allostatic load in order to sustain the strength, resilience and capabilities of the personnel before, during, and after deployment [6–10].

In conjunction, it ought to be noted that there are recent growing healthcare concerns regarding environmental challenges, which are warfighters facing with in the modern operation theaters. That, along with environmental extremes and stressors (e.g., high altitude hypoxia, cold), includes emerging unconventional, asymmetric, and hybrid warfare [10, 11]. Thus, the armed conflicts or acts of terror sparking in highly populated areas, especially in urban zones, inevitably lead to devastating effects on the bystander civilian inhabitants regardless their age and sex as well as to impacts on the combatants [11–13]. In this light, increasing demand for quality of the public health and growing military needs to perform in hi-tech and stressful environments sustain endeavor to comprehend, mitigate and cure the combat-related injury and illnesses in military and civilian populations. This concept has been deliberated in current doctrines and guidelines on operational medicine and care of combat casualty of military and civilians [14]. In particular the focus of this effort is on increasing performance of far-forward surgical care with implementation of guidelines on the Pediatric Tactical Combat Casualty Care as well as on effectiveness of intensive care system [11, 15].

### 1.2 The burden of the combat stress-related injury and management of PTSD

It is worth emphasizing that there is high recent attention to the advancements for the long-term care of servicemen as well as to the policies on their returning to duty [3, 6–8, 14]. Thus, recent recognition of the stress-related mental illnesses as a great concern of force health protection led to development of a new concept

of the US military health system that has acknowledged complicity of the injuries originated from the combat and operational stress and regarded them in the Stress Continuum Model. Note that this model adopted by the US Air Force, Army, Marine Corps and Navy has become a foundation for Combat and Operational Stress Control (COSC) and Combat Operation Control (COC) paradigm, promoting resilience, surveillance/monitoring, interventions, and management of life-altering stress problems especially, post-traumatic stress disorder (PTSD) [8, 14, 16].

PTSD has emerged as a serious mental health issue among military personnel due to a broad scope of etiological factors, protracted psychological sequelae and growing socio-economical impacts of the illness; e.g., long-term medical care and life disability [14]. Evidently the combat-related PTSD in service members is more complex than in other populations. Specifically, this PTSD conditions are frequently complicated by one or more of the most common co-morbid conditions including traumatic brain injury, chronic pain and other stress disorders; and they are more difficult to treat. Moreover, often the burden of PTSD is inflamed by the negative social stigma attached to the related psychological disorders [8].

Complexity of the biological ground of the PTSD psychopathology creates significant obstacles for effective diagnostics of the disease and assessment of the alleviating treatments in the personalized therapy. In this regards, development and implementation of new techniques would be a worthwhile approach to diversify monitoring of PTSD patients [14]. This effort could also provide military psychiatrist with tools and ability to distinguish servicemen and servicewomen seeking a medical separation from active duty and some compensation through a military medical disability.

### 1.3 Conclusion

Over all, the analysis of the recently reported clinical studies has suggested that combat-related PTSD can be effectively treated in active duty service members. However, there are still serious challenges for the healthcare specialists in the PTSD diagnostics and management especially, in early trauma events at the far-forward combat locations.

These and other current topics of military medicine are subjects of discussion in chapters of this book.


### Author details

Nikolai V. Gorbunov

Henry M. Jackson Foundation for the Advancement of Military Medicine,  
Bethesda, MD, United States of America

\*Address all correspondence to: [gorbunov.nikolaiv@gmail.com](mailto:gorbunov.nikolaiv@gmail.com)

### IntechOpen

© 2021 The Author(s). Licensee IntechOpen. This chapter is distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/3.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. 

## References

- [1] Casualty Care. Army Techniques Publication. No. 4-02.5. Headquarters Department of the Army. Washington, DC, 10 May 2013. <https://armypubs.us.army.mil/doctrine/index.html>
- [2] Current Tactical Combat Casualty Care (TCCC) Guidelines 2020. Defense Health Agency. The Joint Trauma System. Committee on Tactical Combat Casualty Care. Deployed Medicine 2021. <https://deployedmedicine.com/content/40>
- [3] Brent T. The Future of Combat Casualty Care: Is the Military Health System Ready? Santa Monica, CA: RAND Corporation, 2021. DOI:10.7249/RB-A713-1. [https://www.rand.org/pubs/research\\_briefs/RBA713-1.html](https://www.rand.org/pubs/research_briefs/RBA713-1.html)
- [4] Legal Support to Military Operations. Joint Publication 1-04 (JP 1-04). US Department of Defense. 2016. [https://www.jcs.mil/Portals/36/Documents/Doctrine/pubs/jp1\\_04.pdf](https://www.jcs.mil/Portals/36/Documents/Doctrine/pubs/jp1_04.pdf)
- [5] Department of Defense Law of War Manual. US Department of Defense, Office of General Counsel. Washington, DC: DoD; June 2015 (Updated December 2016): Section 1.8.1.
- [6] Force Health Protection. In: Army Techniques Publication 4-02.8. Headquarters, Department of the Army Washington, DC, 9 March 2016. [https://armypubs.army.mil/epubs/DR\\_pubs/DR\\_a/pdf/web/atp4\\_02x8.pdf](https://armypubs.army.mil/epubs/DR_pubs/DR_a/pdf/web/atp4_02x8.pdf)
- [7] Riddle MS, Sanders JW, Smoak B. Force Health Protection: Prevention Deployment-Related Diseases and Non Battle Injuries. In: Out of the Crucible: How the US Military Transformed Combat Casualty Care in Iraq and Afghanistan (Textbooks of Military Medicine). Ch. 7. Eds. Kellermann AL, Elster E., U.S. Army Medical Department, The Borden Institute. US Army Medical Department Center and School Health Readiness Center of Excellence Fort Sam Houston, Texas 2017. <https://bookstore.gpo.gov/products/out-crucible-how-us-military-transformed-combat-casualty-care-iraq-and-afghanistan>
- [8] Combat and Operational Stress Control. In: the MCCDC Doctrine. 2016 PCN 147 000045 00; NSN 0411LP110716 <https://www.marines.mil/Portals/1/Publications/MCTP%203-30E%20Formerly%20MCRP%206-11C.pdf>
- [9] Operator Syndrome: Managing High Allostatic Load. Military.com Network. <https://www.military.com/military-fitness/operator-syndrome-managing-high-allostatic-load>
- [10] Environmental Considerations. In: Field Manual No. 3-34.5/MCRP 4-11B (3-100.4). HEADQUARTERS, DEPARTMENT OF THE ARMY; Washington, DC. 16 February 2010 <https://www.marines.mil/Portals/1/Publications/MCRP%204-11B%20Enviromental%20Considerations.pdf?ver=2016-09-08-171729-470>
- [11] Kotwal RS, Staudt AM, Mazuchowski EL, Gurney JM, Shackelford SA, Butler FK, Stockinger ZT, Holcomb JB, Nessen SC, Mann-Salinas EA. A US military Role 2 forward surgical team database study of combat mortality in Afghanistan. J Trauma Acute Care Surg. 2018 Sep;85(3):603-612. doi: 10.1097/TA.0000000000001997. PMID: 29851907.
- [12] Epps VC. Civilian Casualties in Modern Warfare: The Death of the Collateral Damage Rule. Ga. J. Int'l & Comp.41, 307-355 2013. <https://digitalcommons.law.uga.edu/gjicl/vol41/iss2/2>
- [13] Annual Report on Civilian Casualties in Connection With United States

Military Operations. US Department of Defense. 2018 <https://media.defense.gov/2019/May/02/2002126767/-1/-1/1/ANNUAL-REPORT-CIVILIAN-CASUALTIES-IN-CONNECTION-WITH-US-MILITARY-OPERATIONS.PDF>

[14] Stewart W, Trujillo KT. Modern Warfare Destroys Brains: Creating Awareness and Educating the Force on the Effects of Blast Traumatic Brain Injury. Belfer Center for Science and International Affairs. Harvard Kennedy School. Cambridge, MA 02138 <https://www.belfercenter.org/sites/default/files/2020-07/ModernWarfareDestroysBrains.pdf>

[15] Pediatric Tactical Emergency Casualty Care [http://www.c-tecc.org/images/content/FINAL\\_V.1.0\\_Pediatric\\_Guidelines.pdf](http://www.c-tecc.org/images/content/FINAL_V.1.0_Pediatric_Guidelines.pdf)

[16] Frueh BC, Madan A, Fowler JC, Stomberg S, Bradshaw M, Kelly K, Weinstein B, Luttrell M, Danner SG, Beidel DC. "Operator syndrome": A unique constellation of medical and behavioral health-care needs of military special operation forces. *Int J Psychiatry Med*. 2020 Jul;55(4):281-295. doi: 10.1177/0091217420906659. Epub 2020 Feb 13. PMID: 32052666.