



RISC MANAGEMENT: THE MEDICAL SUPPORT SYSTEM IN CONTEMPORARY ARMED CONFLICTS

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Introduction. Contemporary armed conflicts are characterized by a multifaceted blend of combat strategies, encompassing conventional and unconventional weaponry, regular and irregular forces, terrorist actions and acts of organized crime, indiscriminate violence and outside international law.

Material and methods. A retrospective bibliographic study was conducted on the evolution of combat strategies employed by the U.S. Armed Forces, NATO member countries, and international UN Peacekeeping Operations over the past 25 years.

Results. The way of organizing and providing medical assistance in local military conflict differs from the principles governing medical support in major armed conflicts. The staging of the treatment system and the evacuation of the wounded follows a crucial time-based framework known as the '10-1-2(+2)' rule: "10" – immediate measures to stop bleeding within 10 minutes of the injury; "1" – evacuation to the medical treatment facility capable of performing resuscitation and stabilizing vital functions.; "2" – timely transfer to a medical formation equipped for Damage Control Surgery and Resuscitation within 2 hours of the injury; "+2" – performing the surgical intervention, stabilization of vital functions, and diagnostic preparations for strategic evacuation within 4 hours of the injury.

Conclusions. Resulting from the specific particularities of the local military conflict, the planning of medical support as well as the complex of treatment and evacuation measures, force health protection, medical logistics, require adaptation to the real tactical and medical situation created.

Cuvinte-cheie: conflict militar, sprijin medical, eşalonarea, serviciu medical, Role.

GESTIONAREA RISCURILOR: SISTEMUL DE SPRIJIN MEDICAL ÎN CONFLICTUL ARMAT CONTEMPORAN

Introducere. Conflictul militar contemporan poate fi caracterizat ca o combinație a diverselor moduri de de luptă, utilizând armele convenționale și neconvenționale, forțe regulate și neregulate, acțiuni teroriste și alte acte de criminalitate organizată, violență nediscriminatorie și alte acțiuni care contravin dreptului internațional.

Material și metode. A fost realizat un studiu bibliografic retrospectiv din ultimii 25 de ani a evoluției modului de luptă ale Forțelor Armate ale SUA, țărilor membre NATO, precum și operațiunile internaționale de menținere a păcii ONU.

Rezultate. Modul de organizare și acordare a asistenței medicale în conflictul militar local diferă de la principiile sprijinului medical în conflictul militar major. Eșalonarea sistemului de tratament și evacuare a răniților se bazează pe imperativul intervalului recunoscut ca „10-1-2(+2)”: „10” – controlul căilor respiratorii și hemostaza provizorie – până la 10 minute de la momentul rănirii; „1” – evacuarea la formațiunea medicală cu capacitățile de efectuare a resuscitării/stabilizării funcțiilor vitale; „2” – evacuarea la formațiunea medicală care asigură asistența chirurgicală de urgență – până la 2 ore de la momentul rănirii; „+2” – efectuarea intervenției chirurgicale, stabilizarea funcțiilor vitale, diagnosticarea rectificată vizând pregătirea răniților pentru evacuare strategică – până la 4 ore de la momentul rănirii.

Concluzii. Reieșind din particularitățile specifice ale conflictului militar local, planificarea sprijinului medical cât și complexul de măsuri de tratament și de evacuare sanitaro-igienice și antiepidemice, logistica medicală necesită adaptare la situația tactică și medicală reală creată.

INTRODUCTION

The changing landscape of armed conflicts in the past three decades has given rise to novel trends and diverse scenarios in the preparation and execution of combat operations. Consequently, military strategies have undergone significant modifications (1). The advent of cutting-edge technologies has ushered in a revolutionary shift in the methods and approaches employed in combat actions. Modern armed conflicts are distinguished by the fusion of various modes of engagement: encompassing traditional and unconventional weaponry, both regular and irregular forces, instances of terrorism, organized criminal activities, indiscriminate violence, and actions that operate beyond the international law (2). In the majority of contemporary armed conflicts, operational military forces typically consist of task forces ranging from 1-2 battalions up to a brigade, responsible for autonomous and self-sustained combat operations. Insights gleaned from recent operational experiences underscore a discernible contrast in the structure and delivery of medical assistance between regional military conflicts and large-scale armed confrontations.

The aim of the study is to highlight the particularities related to the changing nature of armed conflicts and their impact on military strategies, technological advances, and medical support systems.

MATERIAL AND METHODS

A comprehensive retrospective bibliographic study was conducted to trace the evolution of combat action methodologies within the United States of America, NATO member nations, and international UN Peacekeeping Operations over the past 25 years.

RESULTS

Contemporary armed conflicts are distinguished by the execution of combat actions utilizing resources and capacities aligned with peacetime organizational structures, often involving partial mobilization. These conflicts typically occur within confined operational zones, with the timeframe for conducting combat actions spanning anywhere from as short as 6 days (as seen in the 1967 Arab-Israeli conflict) to as extended as 8 years (as observed in the 1980-1988 Iran-Iraq conflict). The intensity of combat actions during such conflicts displays cyclic fluctuations, marked

by the gradual accumulation of forces and resources over a span of up to 6 months, leading to direct combat engagements lasting around 7 days. Importantly, the civilian populace residing in the involved belligerent parties is exposed to substantial risks stemming from detrimental factors, resulting in the unfortunate occurrence of collateral losses (2).

The core concept of the modern staged treatment and evacuation system lies in the sequential implementation of treatment procedures, following a specific order of medical stages. These stages are closely linked with the transfer of wounded or sick individuals to specialized medical units, aligning with their medical requirements and designated destinations. Additionally, this approach factors in the dynamic interplay between the prevailing combat circumstances and the medical settings (3, 4, 5).

As per the stipulations of the NATO Directive of 2010, the previously emphasized critical time frame for delivering medical assistance known as the "Golden Hour" has been replaced by the '10-1-2 (+2)' interval, comprising:

- "10" – stop bleeding - up to 10 minutes from the time of injury;
- "1" – evacuation to the medical treatment facility capable of performing resuscitation/stabilization of vital functions;
- "2" – evacuation to the medical formation that provides Damage Control Surgery and Resuscitation – up to 2 hours from the time of injury;
- "+2" – surgical intervention, stabilization of vital functions, diagnosis aimed at preparing the wounded for strategic evacuation (STRATEVAC) – up to 4 hours from the time of injury.

Taking into account the "optimal range" and the capacities of medical units within the Armed Forces of NATO member countries and the United States of America, the medical service assets and resources are organized into four distinct levels: Role 1, 2, 3, and 4. These medical units are categorized into Roles based on their minimum clinical and paraclinical capabilities (tab. 1). Additionally, it's noteworthy that the operational readiness and mobility of these medical units align with the military structures they support.



Table 1. The capabilities of Role 1 (R1) level medical treatment facility.

The capabilities	Ensures the primary medical assistance of the workforce, including first aid (medical aid), triage, resuscitation and stabilization activities.
	Ensures the retrieval of the wounded individuals and their readiness for evacuation.
	Provides elements of preventive medicine.
	Provides a medical protection component against weapons of mass destruction, probably used by the adversary.
	May include minimal capacities for providing short-term patient care, primary dental services, a laboratory for conducting essential analyses, and personnel trained in combat stress management.
	Can allocate forces and means for the medical support of the forces, whether from advanced positions or isolated locations.
Can allocate forces and means to establish rapid response medical teams.	

The Role 1 medical treatment facility encompasses the Battalion Aid Station (BAS), which serves as the fundamental component of the battalion's medical platoon.

The organizational structure of the medical platoon comprises the following components: management, treatment unit, ambulance unit, and health instructors' unit. The Commander, treatment and ambulance units together form the Battalion Aid Station within the battalion.

The treatment unit serves as a fundamental component in delivering medical aid at the battalion level. The unit's personnel are organized into two groups:

- group "A" consists of a doctor and up to three nurses.

- group "B" comprises a paramedic and up to three health instructors.

The ambulance unit comprises two ambulance teams: a tracked ambulance team with three members and a wheeled ambulance team with two members. This section is responsible to transport the wounded from the injury site or Casualty Collection Point (CCP) to the Battalion Aid Station (BAS).

The combat medic unit consists of combat medics, each assigned to a maneuver company.

The Role 2 (R2) medical treatment facility possesses the capability to receive and prioritize wounded individuals, as well as provide advanced resuscitation and treatment for traumatic shock (tab. 2).

Table 2. The types of Role 2 and their capabilities (6).

The types	The capabilities
Role 2 Forward (R2F) – the advanced medical formation, with high mobility <i>(The resources of the given formation are limited)</i>	advanced emergency surgical assistance postoperative care preparing the wounded for further evacuation
Role 2 Basic (R2B) – the mobile medical treatment facility <i>(Limitations in the hospitalization of the wounded and medical supply constraints)</i>	reception triage resuscitation and emergency surgery postoperative care
Role 2 Enhanced (R2E) – strengthened medical treatment facility	diagnostic specialized medical assistance prepare the wounded for strategic evacuation (STRATEVAC)

The unit can be deployed independently to enhance the delivery of medical assistance within

the operational theatre.

The medical support concept of the United States Armed Forces dictates that each branch or type of service possesses its own Role 2 medical formations.

Within the Land Forces, these formations consist of the medical company and the Advanced Surgical Team.

There are two types of medical companies, each carrying out the same missions, but differing in their operational areas:

1. The Brigade Medical Support Company, also referred to as the "Charlie Company", operating within the Brigade Support Battalion, offers medical assistance at Role 1 and 2 levels to personnel within the tactical group at the brigade level, including the reinforced units. Depending on the situation, the company can establish up to four medical teams, each comprising a surgeon, three paramedics, and three nurses, capable of autonomous operation.
2. The Area Support Medical Company is an integral part of a medical battalion within the medical brigade.

The company creates medical teams intended for deployment within the division support brigade. These teams perform operations in the rear area of the division or at a corps logistics group. The primary mission is to provide medical aid to operational units that lack internal medical formations within their organizational structure (6).

In light of the insights gained from the "Desert Storm" operation in 1991, a decision was made to eliminate the Mobile Army Surgical Hospital (MASH) from the division-level treatment and evacuation system.

The hospital's responsibilities were handed over to the Forward Surgical Team (FST), whose mission is to provide surgical assistance to injured individuals unable to be transported to the next stage due to conditions such as severe bleeding or respiratory distress.

This team comprises 20 members, including three general surgeons, a traumatologist, two anesthesiology nurses, and three general nurses.

The FST has the capacity to conduct 20 surgical procedures daily, with subsequent intensive care lasting up to 6 hours per patient. Overall, intensive therapy can be provided to a maximum of 8

injured individuals simultaneously, for a duration of up to 72 hours (7, 8).

Surgical aid for the wounded adheres to the "Damage control" principle, focusing on surgical interventions aimed at preserving the lives of the injured individuals.

The term "Damage control," derived from the American maritime terminology, signifies the use of all available resources in the effort to rescue a sinking vessel.

The approach of initially planned surgical treatment was employed to reduce mortality rates among individuals with abdominal injuries, particularly those complicated by significant hemorrhaging. This approach aims to avert organ evisceration and postpone the repair of injured organs until the patient's vital functions have been stabilized.

The Role 3 (R3) level medical treatment facility encompasses the following capabilities:

1. This medical formation is designed to deliver secondary medical care, possessing the capacity to admit and retain severely injured or critically ill patients within a hospital setting. It is fully equipped to conduct comprehensive diagnoses and deliver specialized surgical treatments and recovery services for injuries sustained in combat. Depending on the prevailing operational protocols, patients may also be transferred to a Role 4 Medical Treatment Facility (MTF). The R3 facility is staffed with experts in essential surgical disciplines, anesthesia-intensive therapy, internal medicine, infectious diseases, ophthalmology, neurology, and others, as necessitated by the mission. The equipment is tailored to suit the specific requirements of the overall task.
2. The facility provides services for blood transfusion and blood substitutes.
3. Depending on specific needs, the facility may include specialized departments with experts in neurosurgery, oral-maxillo-facial surgery, and advanced medical imaging techniques such as computed tomography, ultrasound, arthroscopy, and more (9).

The medical units within the Role 3 echelon constitute the apex of medical aid accessible within the operational theatre, offering the most extensive hospitalization capabilities.

These medical formations are designed to operate at the army corps level and are represented by the Combat Support Hospital. Their core mission is to deliver comprehensive medical support, encompassing both outpatient and inpatient care, to all patient categories within the Operation Theatre.

The hospital structure comprises:

1. Management, along with a management detachment.
2. Hospital Company with 84 beds (Alpha Co).
3. Hospital Company with 164 beds (Bravo Co).

The "Alpha" company (44 beds) comprises the following capabilities: 2 operating rooms (with a maximum capacity of 36 hours for surgical interventions per day), 2 intensive care units (each with 12 beds), and a hospital unit (20 beds). In addition to the Hospital Reinforcement Element's

capacity (20 intensive care beds), it also constitutes a Field Hospital (84 beds).

The capabilities of the 'Bravo' hospital company (164 beds) encompass: 4 operating rooms (with a maximum capacity of 60 hours for surgical interventions per day), 2 intensive care units (each having 12 beds), and 7 inpatient units (each equipped with 20 beds) (10).

A hospital ship (Hospital Ship) with a capacity of 1000 beds (including 100 intensive care beds and 12 operating rooms) is designated for providing medical assistance within the Naval Forces at the Role III level (11 - 14).

The Role 4 (R4) medical treatment facility encompasses a wide range of specialties, investigations, and medical procedures. This medical unit operates within the national territory, at its designated permanent deployment location.

CONCLUSIONS

1. While a significant portion of today's global operations involve peacekeeping missions, it's important to acknowledge that there are various other types of military conflicts in their active phases as well.
2. Due to the unique characteristics of local military conflicts, the planning of medical support, along with the intricate set of treatment and evacuation measures, force health protection, and medical logistics, necessitates adaptation to the actual tactical and medical circumstances.
3. This imperative calls for the integration of contemporary approaches methods in medical support, spanning from the battlefield to the recovery of the wounded and sick.

CONFLICT OF INTERESTS

Authors declare that they do not have conflicts of interest.

ETHICAL APPROVAL

The article was not approved by the Ethics Committee because it does not contain ethical risks.

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